Third annual report of the Wisconsin Agricultural Experiment Association : Madison, Wis., Feb. 8, 9, 1905. Address of president, secretary's report with papers and addresses given by members of the as...

Wisconsin Agricultural Experimental Association
Madison, Wisconsin: Democrat Printing Co., State Printer, 1905

THIRD ANNUAL REPORT

OF THE

WISCONSIN

Agricultural Experiment Association

Madison, Wis., Feb. 8, 9, 1905

Address of President, Secretary's Report with Papers and Addresses given by Members of the Association and Others Interested in Progressive Agriculture

---

Compiled by

R. A. MOORE, Secretary

MADISON
DEMOCRAT PRINTING CO., STATE PRINTER
1905

"I know of no pursuit in which more real and important service can be rendered to any country than by improving its agriculture."—Geo. Washington.

"Agricultural education aims to bring the student into intelligent and sympathetic co-operation with the world in which he must live and labor."—Pres. W. O. Thompson, Ohio State University.

LETTER OF TRANSMITTAL.

Governor of the State Wisconsin:

WISCONSIN AGRICULTURAL EXPERIMENT ASSOCIATION.
Madison, Wis., 1905.

To His Excellency, ROBERT M. LAFOLLETTE,
Governor of the State of Wisconsin:

SIR—I have the honor to submit for publication, as provided by law, the Third Annual Report of the Wisconsin Agricultural Experiment Association, showing the receipts and disbursements the past year, also outlines for experiments, and addresses and discussions given at the annual meeting at Madison, February, 8–9, 1905.

Respectfully submitted,

R. A. MOORE,
Secretary.

TABLE OF CONTENTS.

	Page.
Letter of Transmittal	iii
Officers and Committees of the Association	vii
Constitution and By-Laws	viii
List of Members	x
Program for Annual Meeting	xvi
President's Address	1
Secretary's Report	4
Growers of Swedish Select Oats	13
Growers of Wisconsin Seed Corn	14
Papers and Addresses by Members of the Association	16
Rape as a Forage Plant for Sheep, Wm. F. Renk	16
Rape as a Forage Plant, E. J. Fruit	17
Rape, E. E Jones	18
Rape as a Forage Plant for Cattle, Minnick Rood	19
Rape as a Forage Plant, H. E. Rosenow	20
Rape as a Forage Plant for Cattle, George Q Emery	22
A Mixture of Rape, Soy Beans and Corn as a Silage Crop, W. L. Illian	23
Rape as a Forage Plant for Hogs, C. H. Ashton	25
Treating Seed Grain to Prevent Smut:	
S. A. Eastman	25
W. J. Steinhoff	26
J. G. Zabel	27
Walter Gerhard	28
Gottlieb Muehleisen	29
Discussion	30
Experiments With Soy Beans:	
P. A. Dukleth	33
Norman Ovitt	37
Arthur F. Rosenow	38
Rufus Gillette	39

Papers, etc., by Members of the Association—continued. Page.

Swedish Select Oats (Wisconsin No. 4):

H. J. Renk 41
W. E. Bussewitz 42
William L. Illian 43
Herman Olsen 44
E. D. Ebert 45
Harry W. Griswold 46

Alfalfa:

H. E. Rosenow 47
Frank Kleinheinz 52
Lester Batho 53
J. P. Bonzelet 54
E. F. Heuer 55
E. A. Beule 56
Discussion 58

Co-operative Living, O. M. Strand 60
Farmer's Telephones, Wm. F. Curran 65
A Co operative Telephone Line, W. J. Ghastin 67
Co-operative Creameries, W. H. Hanchett 68
Some Problems in Corn Breeding, W. A. Toole 73

Corn:

Reid's Yellow Dent, A. E. Howard 78
Leaming Yellow Dent, Geo. Q. Emery 78
Clark's Yellow Dent, R. A. Gillette 79
Indiana Yellow Dent, R. A. Gillette 80
Indiana Yellow Dent, Emil Dreger 80
Silver King, Wisconsin No. 7.
Adolph Suhr 81
Fred P. Grebe 82
Arthur F. Rosenow 83
C. H. Schafer 83
Discussion 84

Members of the Experiment Association and the State Fair, Hon. John M. True 85
Value of the Weather Bureau to Farmers, J. P. Bartlett 86
Discussion 94
Topics of Interest Observed at the St. Louis World's Fair, A. L. Stone 95
Separating Oats from Barley, Rufus Gillette 108
Should Agriculture be Added to the Curriculum of Studies in the Public Schools, C. P. Cary 109

Papers, etc., by Members of the Association—continued. Page.

Extracts from Superintendent's Biennial Report on Teaching Elements of Agriculture 112
Special Crops, T. S. Biggar 115
Work of a Boys' Experiment Club, O. J. Kern 117
Infectious or Epizootic Abortion of the Cow, A. H. Hartwig 124
Division of Farm Crops, R. A. Moore 127
Experiment No. 1, Alfalfa 129
Experiment No. 2, Wisconsin Seed Corn 132
Experiment No. 3, Potato Scab 134
Experiment No. 4, Oat Smut 136
Experiment No. 5, Swedish Select Cats 138
Experiment No. 6, Forage Rape 139
Experiment No. 7, Soy Beans 144
Division of Farm Engineering, G. N. Knapp 147
Division of Agricultural Chemistry, F. W. Woll 151
Business Meeting 156
Secretary's Report on State Appropriation 159
Treasurer's Report 161
Display of Grain and Forage Plants for 1905 163
Premium List, 1905 165
Rules and Regulations Under Which Premiums are given 167
Wisconsin Corn Study, R. A. Moore 168
Corn Judging, Lesson I 172
Corn Judging, Lesson II 174
Corn Judging, Lesson III 176
Corn Judging, Lesson IV 177
Corn Judging, Lesson V 179
Corn Judging, Lesson VI 180
Corn Judging, Lesson VII 182
Seedling Apples and their Planters, A. J. Philips 184

OFFICERS, 1905.

President—A. L. STONE.....Madison
Vice President—WM. F. CURRAN .....Sechlerville
Secretary—R. A. MOORE.....Madison
Treasurer—P. A. DUKLETH.....R. D. 40, Mukwonago

COMMITTEES.

Program:	Officers of the association.	
Executive:	L. P. Martiny	North Freedom
	Joseph Roeckel	Stark
	R. H. Poston	Oconomowoc
	H. J. Renk	Sun Prairie
	E. E. Jones	Rockland
	L. M. Hatch	Oakfield
Resolutions:	Sherman Hubbard	Evansville
	Roy T. Harris	Madison
	R. B. Snyder	Clinton
Co-operative Experiments:	Farm Crops	R. A. Moore
	Chemistry	F. W. Woll
	Agricultural Physics	A. R. Whitson
	Farm Engineering	G. N. Knapp

CONSTITUTION AND BY-LAWS.

CONSTITUTION.

Article I.—Name.

This organization shall be known as the Wisconsin Agricultural Experiment Association.

Article II.—Object.

The object of this association shall be to promote the agricultural interests of the state.

1st. By carrying on experiments and investigations that shall be beneficial to all parties interested in progressive farming;

2d. To form a more perfect union between the former and present students of the Wisconsin College of Agriculture, so as to enable them to act in unison for the betterment of rural pursuits in carrying on systematic experiments along the various lines of agriculture;

3d. By growing and disseminating among its constituency new varieties of farm seeds and plants;

4th. By sending literature bearing upon agricultural investigations to its membership, and

5th. By holding an annual meeting in order to report and discuss topics and experiments beneficial to the members of the association and those interested in progressive farming.

Article III.—Membership.

Section 1. All former, present and future students and instructors of the Wisconsin College of Agriculture shall be entitled to become members of this association.

Sec. II. Honorary membership may be conferred upon any one interested in progressive agriculture by a majority vote at any annual or special meeting of the association.

Article IV.—Dues.

A fee of fifty cents shall be collected from each member annually.

Article V.—Officers.

The officers of this association shall consist of a president, vice-president, secretary and treaurer, whose term of office shall be one year or until their successors are elected.

Article VI.—Duties of Officers.

Section I. It shall be the duty of the president to preside at all meetings of the society and enforce the observance of such rules and regulations as will be for the best interest of the organization; to appoint all regular committees as he may deem expedient for the welfare of the association.

Sec. II. In the absence of the president, the vice-president shall preside and perform all duties of the president.

Sec. III. It shall be the duty of the secretary to keep all records of the association; to report the results of all co-operative experiments carried on by its membership and the experiment station; plan the experimental work as far as possible for the members of the association, and labor for the welfare of the society in general.

Sec. IV. The treasurer shall collect fees, keep secure all funds of the association and pay out money upon the written order of the secretary signed by the president. He shall furnish bonds in the sum of two thousand dollars with two sureties, for the faithful performance of his duties.

Article VII.—Amendments.

This constitution may be amended at any annual meeting by a two-thirds vote of the members of the association present.

BY-LAWS.

Article I. The officers of this association shall be elected by ballot at the annual meeting.

Art. II. The president and secretary shall be ex-officio members of the executive committee.

Art. III. This association shall be governed by Robert's Rules of Order.

Art. IV. All members joining at the organization of this association shall be known as charter members.

Art. V. The time and place of the annual meeting shall be determined by the executive and program committees.

Constitution adopted and organization effected Feb. 22, 1901.

MEMBERSHIP, 1905

Aavang, H. O.....Barneveld.
Ackeret, James J.....Medford.
Accola, Lawrence.....Prairie du Sac.
Aderhold, H. F.....Urbana Ill.
Alexander, Dr. A. S.....Madison.
Almon, Perry T.....Weyauwega.
Amdall, Martin.....Dallas.
Anderson, Alvin.....Whitewater.
Anderson, Martin.....Morrisonville.
Anderson, R. W...New Richmond R. 2.
Andreassen, A. L.....Bloomer.
Andrew, J. S.....Kendalls.
Andrews, Arthur L.....So. Wayne.
Andrew, W. R.....Livingston.
Arnold, Cliff B.....Greenwood.
Ashton, Blaine.....Belmont.
Ashton, Charles.....Belmont.
Ashton, W. L.....Belmont.
Athearn, L. J.....Oshkosh.
Atwood, Melvin L.....Rockford, Ill.
Baker, Edgar D.....Whitehall, Ill.
Baker, F. E.....Whitehall, Ill.
Bale, Robert O.....Augusta, N. J.
Ball, Leroy C.....Monroe.
Barkhausen, Ernest.....Thiensville.
Barlass, Robert.....Janesville.
Barmore, Trevor J.....Juda.
Barron, R. E.....Platteville.
Batho, Lester.....Plum City.
Bathrick, H. R.....Marshfield.
Becker, P V.....Plymouth.
Behrens, B. F. C.....Gratton.
Belda, William F.....DeForest.
Bell, George S.....Madison.
Bell, LeGrand L.....Brooklyn.
Bemish, Frank R.....Charlotte, N. Y.
Benedict, A. M.....Mazomanie.
Benedict, Eugene.....Beloit.
Bennett, Arthur F.....Pewaukee.
Bennett, Charles S.....Belvidere, Ill.
Benson, Ed E.....Mt. Horeb, R. 5.
Berg, W. E.....Bloomer.
Best, Frank.....Brooklyn.
Beule, Elmore A.....Fox Lake.
Bewick, W. W.....Madison.
Biddick, H. E.....Livingston.
Biggar, T. S. Walkerville, Ontario, Can.
Biglow, L. F.....Brooklyn.
Bilkey, Joseph .....Portage, R. 2.
Bille, J.....Waupaca, R. 1.
Bixby, Phill T.....Appleton.
Blackmun, Eugene.....West Bend.
Blakely, Albert J.....Neenah.
Blanik, George F.....Algoma, R. 3.
Boggess, Charles P.....Catlin, Ill.
Bonnell, A. L.....Point Bluff.
Bonzelet, John P.....Fifield.
Boss, S. J.....Oshkosh.
Boss, U. C.....Oshkosh.
Boucsein, Louis G.....Detroit Harbor.
Bourret, Floyd.....Livingston.
Bowden, Charles B.....West Salem.
Brehm, Alvin.....Colby, R. R. 1.
Brewer, Burt F.....Berlin.
Bristol, Abel C.....Oakfield.
Brooke, James W.....Salem.
Brown, E. D.....West Salem.
Bruhn, Aksel.....Spring Green.
Brunner, Martin.....Cato, R. 2.
Buck, Julius B.....Phillips.
Buehler, J. G.....Twin Bluffs.
Bunker, H W.....Clinton.
Bussewitz, W. E. .....Juneau.
Butler, Edward. N. Milwaukee, R. 11.
Campbell, George.....Augusta.
Capener, Howard.....Baraboo.
Carey, Clinton.....Redgranite.
Carter, Ralph W.....Osseo.
Cartwright, W. B.....Tangier, Ind.
Catt, Harry.....Clintonville.
Chase, James P .....Sun Prairie.
Chatterton, Ray W.....Basco.
Chetlain, L. A.....Galena, Ill.
Chloupek, Victor.....Mishicot.
Chrisler, Harley E.....Lodi.
Christianson, Orin A. Pleasant Prairie.

Christiansen, W. O....Chippewa Falls.
Christianson, C. A.....Walsh.
Christianson, Geo. Chippewa Falls, R. 6
Chrysler, Harvey S.....Osseo.
Church, G. S.....Allenville.
Chynoweth, H. E.....Madison.
Clack, John H.....Appleton.
Clark, C. F.....Madison.
Clark, J. D.....Whitewater.
Clark, W. E.....Stevens Point, R. 1.
Clendening, H. V...Harding, Manitoba.
Clow, A. D.....Lodi.
Clusen, Reinhold.....Manitowoc.
Cobb, Homer A.....Sun Prairie
Cockerill, Hugh L.....Berlin.
Cole, W. B.....Pleasant Prairie.
Colenso, James E.... ..Hinsdale, Ill.
Collin, D. W..... Luxemburg, R. 5.
Conant, W. A. ..... Boston, Mass.
Conger, Theo Jr.....Madison.
Connell, Wesley F.....Colgate.
Conway, J. P.....Elroy.
Coon, Elam P.....Stoughton.
Cooper, Arthur.....Elizabeth, Ill.
Cramer, John J.....Marshfield.
Cross, A. J.....Allenville.
Crow, Ray.....Monroe.
Curran, William F.....Sechlerville.
Dahlen, Melvin T.....Westby, R. 1.
Daniel, John.....Cambria.
Dale, Clarence H.....Soldier's Grove.
Davies, John.....Mineral Point.
Davis, James A.....Viroqua, R. 4.
Davis, John F.....Barneveld.
Deleglise, Leo L.... ..... Antigo.
Delsman, Theodore.Manitowoc, R. 20.
Dennison, Nicholas. (No. Milw.) R. 10.
Dettinger, W. F. .....Hinsdale, Ill.
Devine, B M.....Evansville, R. 20.
Dickey, Meldrum.....Green Bay.
Dietrich, John J....Black River Falls.
Dineen, C F.....Cedarburg.
Dixon, Darley.....Cuba City.
Donaldson, E A.....Eau Claire, R. 3.
Donaldson, H. A.....Eau Claire, R. 3.
Dreger, Emil L.....Madison. R. 6.
*Drissen, P. J.... ....Athens.
Dukleth, Peter A...Mukwonago, R. 40.
Eastman, Seth A....Sheboygan Falls.
Ebenreiter, H. A.....Sheboygan Falls.
Ebert, E. D. .... Tomah.
Ebert, Francis E.....Tomah.
Eddy, Allen R.....Lancaster.
Ehrhardt, Daniel.....Knowles.

*Deceased.

Ellickson, Alfred C.....Cambridge.
Ellickson, Arthur.....Arlington.
Ellis, Vernie G.....Evansville.
Ely, Scott D.....Spring Green.
Emery, George Q. ..... Stoughton.
Emery, Lyman J.....Marshfield, R. 4.
Erickson, Eric..Soldier's Grove. R. 4.
Evans, Thos. H... ....Wales.
Evans, William H.....Wales.
Evert, Edward J.....Pewaukee.
Farnam, Ernest.....Shiocton, R. 29.
Fawcett, Louis S.... .... Stanley.
Feathers, O. C.....Manawa, R. 1.
Fenber, William.....Bay City.
Finsnes, Andrew.....Stoughton.
Fischer, Louis .... Haven, R. 6.
Fleishauer, C. K.....Arkansaw.
Ford, Thomas R....653 Walker St. Mil.
Forsythe, John N.....Baldwin.
Fowler, H. K.....Madison.
Fox, Charles L.....Leon.
Fox, E. W.....Quarry.
Fox, H. T.....Durand, R. F. D. 2.
Frauenheim, Oscar.....Random Lake.
Freeman, George A.....Sparta.
Fruit, B. L.....Arthur.
Fruit, Clyde E.....Arthur.
Fruit, Earl J.....Arthur.
Fruit, J.....Arthur.
Fruit, J. P.....Arthur.
Fuller, J. G.....Madison.
Gallagher, Michael M.....Elroy.
Ganschow, W. C. .....Bondue.
Gerhardt, Walter .....Neillsville.
Gerking, Fred J.....Elk Mound
Ghastin, William H.....Twin Bluff.
Gibbard, Peter .....Ripon.
Gillette, Refus A..... ....Verona.
Gimre, Karl ....Madison.
Glindinning, Harry L.....Shullsburg.
Goddard, M. C.....Ft. Atkinson.
Goldsmith, R. B.....Weyauwega.
Gordon, J. Roy.....Mineral Point.
Granum, Norval.....Dallas.
Grebe, Fred P.....Randolph.
Greengo, A. L.....Menomonee Falls.
Griffin, James .....Eagle.
Grimstad, A. C.....Barneveld.
Grimwood, Ivan J.....Bristol, Ill.
Griswold, Harry W.....West Salem.
Gruhle, William H.....Barton, R. 1.
Guilford Farm.....Pecatonica, Ill.
Guilford, W. S. ....Racine.
Gullickson, C. E.....Cushing.
Guptill, Lawrence R.....New Auburn.

Haass, Otto.....Merton.
Hackett, Charles H.....Baraboo.
Haevers, Martin.....Luxemburg, R. 4.
Hager, Max H.....Prairie du Sac.
Hagestad, A. C.....Ettrick.
Halbert, Jay.....Augusta.
Halvorson, Theodore.....Whitewater.
Hamilton, Thomas S.....Westfield.
Hanchett, W. H.....Sparta.
Hansen, Norman E.....New Auburn.
Hanson, John H...Conneaut Lake, Pa.
Hanson, Martin N.....Hollandale.
Hanson, Nels P.....Amherst Jct.
Hanzlik, O. J.....Hillsboro.
Hardt, Walter H.....Janesville.
Hargrave, Robert.....Ripon.
Harriman, Fred J.....Shawano.
Harris, R. E.....Warrens.
Harris, Roy T.....Madison.
Harrison, George.....Wilton.
Hartsough, A. L.....South Wayne.
Hartwig, Dr. A. H.....Watertown.
Haseleu, M. T.....Waterloo.
Haskin, I. O.....Prairie du Sac.
Hass, H. A.....Madison.
Hatch, Lewis M.....Oakfield.
Hegge, E. A. .....Pigeon Falls.
Heid, William J.....Ft. Atkinson.
Heidemann, Otto.....Kiel, R. 2.
Heike, Rudolph.....Mondovi.
Heldstab, Christian.....Cameron.
Hendricks, L. E.....Campbellsport
Henry, A. T. .... Wallingford, Conn.
Herdrich, S. F.....Adell, R. 19.
Hermanson, H T.....Rio.
Hesselberg, Arthur E.....Bangor.
Hetts, Gary.....Ft. Atkinson.
Hetts, John.....Ft. Atkinson.
Higday, J. S. .....Evansville.
Hicken, A. B.....Waukesha, R. 7.
Heuer, E. F..... Wautoma.
Hill, Otto.....Mt. Horeb.
Hillier, H. B.....Waunakee.
Hinz, A. F.....Ripon.
Hoefner, Fred C.....Manitowoc.
Holcomb, W. R..St. Bonifacious, Minn.
Hotchkiss, H. B.....Eau Claire.
Houkom, Stephen.....Blair.
Howard, A. E.....Whitewater.
Howitt, Charles.....Randolph.
Hubbard, Sherman...Evansville, R. 18.
Hudson, Dwight.....Reedsburg.
Huebsch, Lewis.....Galena, Ill.
Hughes, Edward.....Fall River.
Hulsether, Albert.....Cambridge.
Illian, W. L.....Adell, R. 19.
Imholt, B. A.....Houlton.
Imig, Arthur H.....Neillsville.
Jahn, Charles.....Cream.
Jahnke, J. F.....Pepin.
Jaquish, J. E. .....Twin Bluffs, R. 1.
Jamison, W. G.....Appleton, R. 2.
Jarr, H. D.....Manitowoc.
Jeffery, H. B.....Menomonee Falls.
Jensen, Rasmus ....Genoa Jct.
Johnson, Alfred E.....Iola.
Johnson, C. G...Clintonville, R. F. D. 1.
Johnson, L. M.....Ashland.
Johnson, Alden.....Weyauwega.
Johnson, Billie.....Strong's Prairie.
Johnson, Kasper.....Blair.
Johnston, F. R.....Appleton.
Jones, Albert.....Dousman.
Jones, E. E.....Rockland.
Joos, Frank B.....Fountain City.
Jordalen, Clarence.....Stoughton.
Kaiser, Edward ....Garnavillo, Iowa.
Keipper, Edward ....Menomonie.
Kendall, Myron.....Waupaca, R. 3.
Kendall, V. F.....Waupaca, R. 3.
Kent, H. W.....Rusk.
Kent, J. S.....Rusk.
Keogh, L. F..... .. Algoma, R. D.
Keys, J. M.....Richland Center.
Kieffer, Michael.....Fredonia, R. 1.
Kieler, Edward.....Louisburg, R. 1.
Kindschi, Lyman.....Prairie du Sac.
Kinney, Robert.....Lancaster, R. 9.
Kinney, Rolla.....Potosi, R. 2.
Kinney, V. H.....Lancaster.
Kitchen, J. H.....Mineral Point.
Klovdahl, John.....Wittenberg.
Klovdahl, O. J.....Wittenberg.
Kluck, F. E.....Lena, Ill.
Kluck, Roy E.....Lena, Ill.
Klussendorf, F.. 1462 Second St. Mil.
Knapp, Prof. G. N.....Madison.
Knudtson, Oscar H.....Beloit, R. 27.
Kohlwey, Otto.....Grafton.
Kolar, F. J.....Muscoda.
Koll, Charles A.....Eau Claire.
Korthals, A. C.....Summit Lake.
Kramer, H. F.....Bloomer.
Kroll, John M.....Shawano.
Krueger, Alexander..Watertown, R. 2.
Kuehn, C. A.....Brandon.
Lachmund, Robert.....Sauk City.
Lanpheer, Harry..Glen Beulah, R. 30.
Larsen, C. L.....Sparta.
Larson, Arthur D.....Waupaca.

Larson, J. M.....Wautoma, R. 1.
Larson, W. B.....Ogdensburg.
Lassell, Wallace.....Orfordville.
Lawrence, F. W.....LaCrosse.
Lawton, Ray .....Viola.
Leach, J. M.....Hilbert, R. 1.
Lee, Ernest W.....Granton.
Lehmann, W. V. V. .....Neosho.
Lewellin, Geo. C..... Waterloo.
Lindas, Theo. A..... .... Marshall.
Linker, William J.....Hartford.
Linse, Charles .....LaCrosse.
Lloyd, Evan B..... .... Cambria.
Logan, R. G.....Greenfield, Ind.
Longanecker, Elmer..Cerro Gordo, Ill.
Longley, Harvey E.....Dousman.
Loomis, Charles W.....Wauwatosa.
Lovejoy, Hiram D.....West Salem.
Lyman, C. A.....Sun Prairie.
Lyon, Wilson B.....Merrillan.
Maas, William C.....Oostburg.
Maddock, D. E.....Maddock, So. Dak.
Mader, J. W.....Sun Prairie.
Mahony, W. J.....Mazomanie.
Main, Herbert A.....Ft. Atkinson.
Malde, O. G..... .. .. Grand Rapids.
Malum, Oscar..... ....Chetek, R. 1.
Markey, W. E.....Sullivan.
Markham, Fred C.....Independence.
Martin, H. A.....Gotham.
Martiny, L. P.....No. Freedom.
Matheson, Martin.....Sawyer.
Mathews, M. D.....Helenville.
*Mayhew, Joseph O.....Greenbush.
McCauley, R. C.....Osseo.
McClure, Mark..Manhattan, Ill. R. 23.
McConnell, R. E.....Tomah.
McGilvra, G. B.....Baraboo.
McNown, J. H.....Mauston.
Meekin, Hamilton W.....Fond du Lac.
Mehnert, J. G....257 27 St. Milwaukee.
Melville, D. H.....Colgate.
Menn, Bennie.....Norwalk.
Meurer, Paul Jr.....Powers Lake.
Meyer, Arthur J.....Oakwood, R. 18.
Meyer, E. J.....Tomah.
Meyer, Louise.....Mishicot.
Miller, Harvey.....Evansville.
Minnich, Hugh.....Baraboo.
Mitchell, J. T.....Cottage Grove.
Moen, George O.....Cambridge.
Mohr, O W...Milwaukee, 350-29th St.
Moody, R. F.....Oshkosh.
Moore, Prof. R. A.....Madison.
Morris, G. C.....Ridgeway.
Morris, O. G.....Wales, R. 31.
Moses, C. P.....Eau Claire, R. 4.
Muehleisen, Gottlieb.....Alma, R. 3.
Mueller, August.....Manitowoc, R. 6.
Mulcahy, John.....Belmont, R. 1.
Murphy, D E...Albuquerque, N. Mexico, Box 104.
Mutch, Stuart.....Jewett.
Myrick, M. O.....Bristol.
Nelson, A. M.....Spring Valley.
Nelson, Erwin A.. ..Kaukauna, R. 12.
Nelson, James.....Waupaca.
Nevens, C. H.....Winnebago, Ill.
Newhouse, Charles.....Clinton.
Nicolaus, Chas.....Troy Center.
Nicolaus, D. C. .....Troy Center.
Nies, Peter.....Greenleaf, R. 3.
Ochsner, Arthur.....Plain, R. 1.
Ocock, C. A.....Madison.
Ogle, J. L.....Urbana, Ill.
O'Keefe, Mike....Stevens Point, R. 1.
Oleson Janes P.....Ripon, R. 13.
Olsen, Harry O.....Larsen.
Olson, Herman A.....Cambridge.
Olson, Otto W.....Walsh.
Orr, Homer L.....Madison.
Osborne, W. F.....Cobb.
Osterday, E. G.....Woodford.
Ovitt, Norman.....Black Creek, R. 32.
Palmer, Howard.....Baraboo.
Palmer, Levi.....Verona.
Parsons, W. A.....Ft. Atkinson, R. 2.
Pattee, William C.....Plover.
Paulson, P. A.....Hudson.
Pearson, Bert O.....Lake Geneva.
Peck, Henry M.....Marshall.
Pederson, C. A.....Cambridge.
Perkins, J. S.....Hickory.
Persons, M. B.....Exile.
Peters, Ezra.....Sharon, R. 2.
Peterson, H. N. .....New Holstein.
Pfeiffer W. A.....West Bend.
Phillips, Jesse.....Elizabeth, Ill.
Pitt, Ernest H..... .....Granton.
Pope, Leon.....Sun Prairie.
Portz, A. J.....Oshkosh, R. 5.
Post, Harry L.....Sextonville.
Poston, R. H.....Oconomowoc.
Powell, Lester J.....Stockbridge.
Pratt, Scott L.....Elwood, Ill.
Premo, K. L..... Prairie du Sac.
Purdy, W. N..... ....Bangor.
Quammen Herman.....Deerfield.
Raichle, Will.....Frenchville.
Rankin, W. D.....Menomonee Falls.

*Deceased.

Raven, John W.....Bloomer.
Ray, H. K..... Kewanee, Ill., R. 5.
Redelings, Henry.....Marinette.
Reek, Joseph.....Neenah, R. 2.
Rehbein, A. E.....Manitowoc.
Remington, A.....Elk Mound.
Renk, H. J.....Sun Prairie.
Renk, W. F.....Sun Prairie.
Richards, John.....Louisburg.
Richardson, George F.....Marinette.
Richardson, L. C.....Oregon.
Richter, B. F.....Faribault, Minn.
Rickmyer, Robert....Sheboygan Falls.
Rietbrock, Fred.....Milwaukee.
Risum, Louis..... .... Brodhead.
Roberts, F. W.....Woodworth.
Robertson, R. B.....Tomah.
Robinson, Virgil.....Gotham.
Roeckel, Joseph P.....Stark.
Roethel, Herman.....Kiel.
Roffers, Henry.....Ashland, R. 1.
Rood, M. C.....So. Wayne.
Rood, O. C.....So. Wayne.
Rosenow, Arthur F.....Oconomowoc.
Rosenow, H. E....Oconomowoc, R. 25.
Rosenow, H. G.....Montana.
Rosenow, Louis J.....Montana.
Russell, A. C.....Genesee Depot.
Rust, C. H.....Mukwonago, R. 38.
Rustad, John.....Blk. River Falls.
Ruste, C. O.....Blue Mounds.
Salter, Ray.....West Bend.
Sampson, Philip A.....Audubon, Iowa.
Savage, Albert .....Quincy, Florida.
Sawin, Lester.....Brooklyn, R. 52.
Saxe, Arthur.....Whitewater.
Schaefer, R. J.....Appleton, R. 1.
Schafer, Chris. Stillwater, Minn. R. 33.
Schumacher, H. C...Kewaunee, R. 1.
Scheid, Frank.....Campbellsport.
Schellenger, R. G.....Warren, Ill.
Schmit, Peter.....Granville.
Scholtz, Charles W.....Pewaukee.
Schottler, Conrad J..So. Germantown.
Schrickel, Edward....Green Bay, R. 2.
Schilling, E. H.....Onalaska.
Schumacher, H. C.....Kewaunee R. 7.
Schwartz, J. A.....Troy Center.
Sette, O. E..... .... Juneau.
Shane, O. J.....Evansville.
Sharpee, C. A.....Rio, R. 1.
Sharpee, E. A.....Rio, R. R., 1.
Sheldon, B. F.....Brandon.
Shepard, R. A.....Columbus.
Skenandore, E. E.....Oneida.
Slaby, E. G..... .. .... Kewaunee.
Smiley, J. B.....Albany, R. 1.
Smithwick, Martin.....Madison, R. 6.
Snyder, A.....Black Earth.
Snyder, H. A.....Brooklyn.
Snyder, R. B..... .....Clinton.
Snyder, Wesley.....Lancaster.
Snuggerud, H. H..... Holmen, R. 2.
Sorenson, H...Franksville, R. F. D. 9.
Spaulding, C. F.....Oconomowoc.
Spoerschneider, Fred..Bay Settlement.
Spink, Harold L.....Platteville.
Stantorf, W. H.....Barnum.
Starker, Charles.....Sun Prairie.
Stauffacher, A. J.....Monroe.
Steele, S. H.....Lodi.
Steidtman, Edwin.....Prairie du Sac.
Steiner, William.....Brownsville.
Steinhoff, W. J.....Platteville.
Steuber, J. D.....Prairie du Sac.
Stevens, M. B.....Jefferson.
Stevenson, J. W.....Rice Lake.
Stienstra, Samuel J.....Galena, Ill.
Stivarius, G. A.....Fennimore.
Stocking, W. F.....Weatogue, Conn.
Stommel, Eugene.....Mayville.
Stone, A. L.....Madison.
Strader, W. Earl.....Augusta.
Straka, Ed E.....Kellnersville, R. 2.
Strand, O. M.....Rice Lake.
Strande, Theo. A.....Taylor.
Stroup, F. G.....Fond du Lac.
Suhr, Adolph.....Cochrane.
Swan, Leon.....Waupaca, Box. 303.
Swenson, O. S....Amherst Jct. R. 1.
Taft, Vernon.....Whitewater.
Tallmadge, J. J.....69–33rd. St. Mil.
Teisberg, Samuel.....Stoughton.
Thieleke, Edwin A.....Kiel, R. 2.
Thomas, J. E. ..... Wales, Ill.
Thompson, Alfred.....Delavan.
Thompson, Chester.....New London.
Thompson, David O..... Athens.
Thompson, Melvin.....Mt. Horeb.
Thomson, Robert J.....Marshall.
Thorstad, N. H..... ..... Deerfield.
Toepel, William.....Cleveland.
Toepfer, Otto.....Madison, R. 6.
Tomkins, A Pearce.....Ashland Jct.
Toole, W. A. Jr.....Baraboo.
Tormey, J. A.....Fennimore.
Treat, P. S.....Compton, Cal. R. 1.
Treleven, Guy.....Omro.
Tretsven, John O.....Milltown.
Troeller, J. M.....Rubicon.

Truesdale, T. S.....Gillingham.
Tubbs, G. P.....Seymour.
Tweeten, Theodore.....Cottage Grove.
Uehling, Otto E.....Afton.
Vandercook, R. I..Linden, Mich. R. 2.
Vandervort, Rollie.....Tomah.
Van Heuklon, W. A. .....Rosendale.
Von Lanyi, Oscar ....Calvary, R. 39.
Vinger, George .....Argyle.
Vogel, Albert.....Chinook, Mont.
Wachter, F. Jr.....Melrose.
Waite, Earl L.....Oshkosh, R. 7.
Walker, Nathan G.....Riverside, Ill.
Walker, Ray C.....Plainville.
Wall, William.....Weyauwega.
Walter, Andrew.....Oshkosh.
Warmington, Prentice...Honey Creek.
Waterstreet, William...Spring Green.
Welles, M. L.....Rosendale.
Welton, Clarence.....Monroe.
Wernich, W. H.....DeForest.
West, Ray N.....Ripon.
West, Robert B.....Caledonia, R. 12.
Weston, Albert.....Audubon, Iowa.
Weston, John.....Burnett Jct.
Whelan, J. V.....Mondovi.
Whittaker, Horace.Fond du Lac, R. 5.
White, T. J.....Vesper.
Whittemore, F. M.....Brandon.
Wiegand, O. R.....Cleveland, R. 8.
Wilkowske, R. T. ....Mishicot.
Williams, Arthur R...Waukesha, R. 8.
Williams, D. T.....Waukesha, R. 8.
Williams, D. W.....Genessee.
Williams, J. E.....Lancaster.
Williams, J. R.....Packwaukee, R. 1.
Williams, J. R.....Lancaster.
Williams, Melvin.....Potosi.
Williman, J. ..Blanchardville, R. R. 1.
Winter, L. H.....Eau Claire.
Wismer, Herman.....Larsen.
Withycombe, H. J.....E. Cleveland. Ohio. 60 Idlewood Ave.
Woll, Prof, F. W.....Madison.
Woodard, Frederick.....Bloomer.
Woodcock, E. R.....Hayton, R. F. D.
Wrabetz, Frank.....Madison.
Wright, M. T.....Waupun.
Wright, T. J.....Mauston.
Zabel, J. G.....Deerfield.
Zahrt, F. H.....Hortonville.
Zerbel, Lewis R.....Madison.

HONORARY MEMBERS.

Ames, W. L.....Oregon.
Babcock, Dr. S. M. .....Madison.
Cary, Prof. C. P. ..... Madison.
Emery, Prof J. Q. .....Madison.
Harvey, Prof. L. D. .....Menomonie.
Hays, W. M., Ass't Secretary Agr.... Washington, D. C.
Henry, Dr. W. A. .....Madison.
Hitt, Hon. H. D. .... Oakfield.
Hoard, Hon. W. D.....Ft. Atkinson.
Karel, Hon. L. A. .....Kewaunee.
McKerrow, Supt. Geo.....Pewaukee.
Newman, Geo., N.....Ladysmith.
Phillips, A. J.....West Salem.
Renk, Katharine.....Sun Prairie.
Toole, William.....Baraboo.
True, Hon. John M. .....Madison.
Whitmore, Mary ..... Janesville.

PROGRAM FOR THE FOURTH ANNUAL MEETING

OF THE

WISCONSIN AGRICULTURAL EXPERIMENT ASSOCIATION.

The officers and members of the Association extend a cordial invitation to all interested in progressive farming to attend its meetings and take part in its discussions.

Wednesday, February 8, 9 A. M.—Agricultural Hall.

Annual Address of President ..... A. L. Stone

Report of Secretary..... R. A. Moore

Co-operative experiments with rape.

Methods of Growing Rape..... B. L. Rundell

Rape as a Forage Plant for Sheep..... W. F. Renk

Rape as a Forage Plant for Cattle..... E. J. Fruit

Discussion J. P. Bonzelet, E. E. Jones, M. C. Rood, H. E. Rosenow, G. Q. Emery, H. T. Hermanson.

Members of the Experiment Association and the State Fair
J. M. True

J. M. True, Secretary State Board of Agriculture.

Co-operative Experiment Treating Seed Grain to Prevent Smut.....
S. A. Eastman, Howard Capener, G. Muehleisen, W. Steinhoff, Julius Zabel, C. J. Johnson, A. R. Eddy, Walter Gerhardt.

General Discussion.

Wednesday, 2 o'clock P. M.—Agricultural Hall.

Importance of the U. S. Weather Bureau to Farmers....J. P. Bartlett
U. S. Weather Observer, Madison.

General Discussion.

Veterinary Selection..... Dr. A. H. Hartwig

Experiments with Soy Beans..... P. A. Dukleth

Discussion: .....R. A. Gillette
Nat. Pope, Jr., J. S. Kent, William Keenan, Clarence Jordalen
Norman Ovitt, A. F. Rosenow.
Topics of Interest Noted at the St. Louis Exposition.....A. L. Stone
Tests with Swedish Select Seed Oats.....H. J. Renk
Wm. Toepel, W. E. Bussewitz, Herman Olson, W. L. Illian,
H. Griswold, Otto Toepfer, E. D. Ebert.
Should Agriculture be added to the Curriculum of Studies in the
Public Schools .....State Supt. C. P. Cary.

Wednesday, 7:30 P. M.—Agricultural Hall.

Joint Session of the Agricultural Experiment Association, Short
Course Alumni and Short Course Literary Society.
Declamation .....H. W. Longley
Vocal solo .....Miss Elsie Taylor
Oration .....Frederick Woodard
Quartette ..... Second-Year Class
Vocal Solo .....W. J. Moyle
Address—"Work of a Boys' Experiment Club" O. J. Kern,
Supt. schools, Winnebago Co., Ill.
Piano Solo .....Miss K. Renk
Selection .....Miss Mabel Taylor
Cornet solo .....Geo. F. Steiner
Paper, Seedling Apples and their Originators.....A. J. Phillips

Thursday, 8 A. M.—Agricultural Hall.

Business meeting.
Election of officers, reports of committees, etc.
Plan of Work for the Coming Year:
Division of Farm Crops.....R. A. Moore
Division of Chemistry.....F. W. Woll
Division of Farm Engineering.....G. N. Knapp
Special Crops.....Thomas Biggar,
Walkersville, Canada
Co-operative Experiments, Papers, Discussion, etc.
Growing of Alfalfa in Wisconsin:
Seeding .....R. H. Poston
Cutting and Curing the Hay.....H. E. Rosenow
Feeding Dairy Cattle.....C. J. McComb
Feeding Sheep ..... Frank Kleinheinz
Discussion E. E. Jones, Lester Batho, J. P. Bonzelet, A. B Hicken,
C. E. Fruit, E. F. Heuer, E. A. Beule.
General Discussion.

Thursday, 2:00 P. M. Agricultural Hall.

Co-operation of Farmers in Wisconsin:
Stores .....O. M. Strand
Telephones .....Wm. F. Curran, W. J. Ghastin
Cheese Factories and Creameries.....W. H. Hanchett
General Discussion.
Growing Seed Corn.....W. A. Toole
Tests With Corn:
Reid's Yellw Dent .....A. E. Howard, E. J. Fruit, Albert Jones
Leaming Yellow Dent .....G. Q. Emery
Clark's Yellow Dent..H. J. Renk, A. Goodell, R. A. Gillette, Brian Rundell, Lester Batho.
Indiana Yellow Dent .....Emil Dreger
Silver King White Dent..R. Clusen, Adolph Suhr, Fred P. Grebe, A. F. Rosenow, Charles H. Schafer.
General Discussion.

THIRD ANNUAL REPORT

OF THE

Wisconsin Agricultural Experiment Association

PRESIDENT'S ANNUAL ADDRESS.

A. L. STONE, MADISON.

Friends and Fellow Members:

We are assembled today for our fourth birthday celebration. While but a child in years our Association is a man in stature and accomplishment.

I want to dwell for a short time on each of three phases of our Association's development: viz., past, present, and future.

Four years ago about this time our worthy Secretary headed a movement for the perfection of an organization of the graduates and instructors of the College of Agriculture.

The aim of this organization and the scope of its work is well expressed in its constitution as follows: "The aim of this Association shall be to promote the agricultural interests of the state."

1st. By carrying on experiments and investigations that shall be beneficial to all parties interested in progressive farming.

2nd. To form a more perfect union between the former and present students of the Wisconsin College of Agriculture, so as to enable them to act in unison for the betterment of rural pur-

suits, and in carrying on systematic experiments along the various lines of agriculture.

3rd. By growing and disseminating among its constituency new varieties of farm seeds and plants.

4th. By sending literature bearing upon agricultural investigations to its membership, and

5th. By holding an annual meeting in order to report and discuss topics and experiments beneficial to the members of the Association, and those interested in progressive farming.

Such, in the words of its founders, were the aims and scope of work of the young organization. Three years have passed away. In this time the Association has grown rapidly; much of the work above outlined has been faithfully carried out, as many of you know who have done yeoman service in the good cause.

Two years ago the legislature came to our aid with an annual appropriation of one thousand dollars, which enables us to carry on our work in a very efficient manner, without too heavy a tax on the members. While it took sometime to get the Association in good running order, under the earnest and faithful management of our capable Secretary we stand at present one of the best organized, smoothest working, agricultural associations in the state. More, we have the *largest* agricultural association in the state, today, having a paid-up membership of over five hundred.

I think but few of our members fully realize the amount of work that is being done. Our membership is so scattered that until each one can get to a meeting like this and listen to the reports and discussions on the work, does he realize how his own little fits in to help make a great whole. Could some of you be with Professor Moore and myself in the office when these reports come pouring in and had the often-times interesting and profitable labor of tabulating the data they contain, you would have a better realization of the amount of work that is being done.

I sometimes wonder do we stop to think how much there is in store for us and our beloved state in this united labor of trained minds, applied to the problems of the farm. The

foundation of the commonwealth is her agriculture, what then may we not expect for Wisconsin with from five hundred to a thousand earnest young men faithfully striving to improve the grains, forage plants, live stock, buildings, and general condition of the farming industry?

Surely, the goal toward which we bend our energies is one worthy of our best efforts. We look to the future for a larger growth both in numbers and knowledge. Our aim is as high as ever, the scope of our work as great, and a united front will cause all obstacles to fade away like mists before the sun and leave us at least masters of our agricultural destiny.

The work of our Association is already attracting the attention of agricultural educators in many other states. Our Secretary receives large numbers of inquiries concerning its aim and purpose. Other states are beginning to agitate the question and the time is soon coming when we will have competitors in our field of labor.

We, however, are the pioneers and it should be our endeavor never to allow others to excel us in our own work.

So let each member strive to do his part faithfully and as well as possible under his particular circumstances. No matter if the work seems a little irksome. Remember how many others beside yourself are helping the good cause and do your share cheerfully. Do not give up with one, two or three failures.

We often learn more by failures than by successes. In this spirit we can accomplish results in Wisconsin that we will point out to our grandchildren with pride in future days.

This meeting is now turned over to you. We want you all to feel free to give of your experience.

Only as you do this can we have an interesting and successful meeting.

SECRETARY'S REPORT FOR 1904.

R. A. MOORE, MADISON.

Worthy Members of the Experiment Association:

It pleases me very much to report to you the material progress made during the past year by our Association. The work carried on by our membership in various lines has not only been interesting and beneficial to our membership, but to the state at large in a high degree.

Membership.—It is encouraging to note the increase in membership and the willingness of members to join in the work. At the close of the calendar year, the Association had a paid-up membership of 525. Many have since joined and prospects seem bright for a considerable increase in our ranks for the year 1905. I think it safe to state that the Wisconsin Experiment Association has the largest membership today of any agricultural organization in the state.

General Interest in the Work of the Association by Other States.—Numerous letters have been received from time to time regarding the history and work of our Society, and several like associations have been organized in connection with various agricultural colleges. Similar work to that which we are now doing is being planned and put into execution.

The principal effort of the Association has been put forth in the Farm Crops Department. Owing to the wide field for improvement in grains and forage plants, it seems that the efforts of the Association can be used to best advantage in pushing that important line of work.

Four hundred members carried on work during the past year and the reports are important in bringing forth much valuable information that will be helpful to all in a continuation of the experiments we have in hand.

Tests With Alfalfa.—Turkestan vs. Common Variety. Two hundred and twenty-six members secured sufficient seed from the Association the spring of 1904, to sow at least one-half an

acre. The seed was of two different varieties, Turkestan and common. The desire was to determine whether or not the Turkestan alfalfa was preferable to the common American variety. We also desire to test alfalfa in as many different localities as possible, and on a wide variation of soil. No full reports were expected the first season of seeding, but one hundred and twenty-four reported as to the stand secured and gave other information that I think worthy of publication.

No. of members experimenting	226
No. of members reporting	124
No. counties from which reports were received	44
No. advocating sowing with nurse crop	110
No. advocating sowing without a nurse crop	14
No. using oats as nurse crop	99
No. using barley as nurse crop	25
No. sowing two varieties	118
No. sowing one variety	6
No. with whom common variety proved best	28
No. with whom Turkestan variety proved best	15
No. who could detect no difference	81
Rate of sowing alfalfa, per acre	20
No. getting good stand	87
No. failing to get good stand	28
No. of failures	9

Causes of failures—Pasturing, Sowing seed too thickly, Drouth, Wet or heavy soil, Cutting nurse crop too close, Other grasses crowding out alfalfa.

We find from the above that eighty-seven out of one hundred and twenty-four reporting secured good stands of alfalfa, also that there was very little difference between the Turkestan and the common variety. We also note that nearly all succeeded best by sowing the alfalfa with a nurse crop.

The data gained from members carrying on these tests coincide with the results from the test made by the writer on the Experiment Station Farm, which leads me to believe that all tests were carefully made. Many of the members who were carrying on tests with alfalfa were visited by your Secretary and conditions carefully noted. I am pleased to report that in nearly all instances the alfalfa looked promising and the tests

showed that care and good judgment had been exerted on the part of the experimenter.

Owing to the importance of alfalfa as a forage plant and from the fact that it seems quite conclusive that it can be grown to advantage in nearly all parts of the state, where care and good judgment is exercised, it seems advisable for our Association to continue experiments along this line until more definite information is obtained. Sufficient alfalfa seed of a standard quality will be obtained to again carry on several hundred tests and our members stand eager to engage in the work.

We desire to note if there is any advantage in inoculating the soil with bacteria-laden earth for the purpose of aiding the alfalfa plants in developing the proper nodules so necessary for the life and growth of the plants. Several tons of earth have been retained by the Experiment Station, and will be sent to those carrying on tests.

Soy Beans.—The dairymen of our state have been, quite largely, in the past dependent upon the producers of high protein food to use as concentrates in forming balanced rations for their animals. This has necessitated large expenditures of money. It seems that the protein feeds should be grown on the farm and the expenditures made for such feeds reduced to a minimum.

Tests with Soy Beans.—Several varieties of soy beans have been tested at the Experiment Station that have given excellent yields, from twenty-five to forty bushels dry beans per acre. Soy beans are very high in protein content, having approximately thirty-five per cent.

It seems that by growing a few acres of early soy beans annually that a large amount of valuable high protein feed could be secured. The few tests with soy beans that have been made by members of the Association seem quite conclusive in one respect and that is that soy beans can be grown and give fairly good yields. Much remains to be learned in regard to harvesting, threshing, grinding and feeding to best advantage. The Experiment Station has been conducting feeding tests with soy beans during the past year and will continue them through a

BREEDING GRAINS AND FORAGE PLANTS.

Nursery beds at the Experiment Station farm.

portion of 1905, when we may expect some important data as to their value as a feed for various kinds of stock.

The soy bean belongs to that great order of plants, that has the power through the action of micro-organisms that inhabit nodules growing upon its roots, to take free nitrogen from the air, and appropriate it for the purpose of building plant tissue and enriching the soil.

By scattering bacteria-laden soil upon the ground where we desire to plant soy beans the plants will readily develop nodules the first season of growth.

Only five members carried on tests with soy beans last year, and of this number four were successful in growing them. Where bacteria-laden earth was scattered on the ground intended for soy beans, the plants readily developed nodules on their roots.

I think it advisable for at least fifty members of the Association, living in portions of the state where the soil is a rich sandy loam, to grow soy beans for seed and carry on experiments in connection with the work.

Outlines for these tests will be prepared in due time and members furnished with seed and soil for inoculation purposes.

Growing Choice Seed Grains.—Wisconsin is naturally favored in having the proper climatic and other conditions favorable for raising pure-bred seed grains. Our rich soil with thorough cultivation, favorably responds to nature's laws, and bountiful crops of a high order can be readily grown. Our moderate climate seems to exert a marked influence on the production of choice seed grain of high vitality. With a combined effort on the part of the membership of our Association, there is no doubt but that Wisconsin will soon be known far and near as the great seed growing state of America.

Wisconsin farmers to a large extent should grow seed grains and by producing the best secure prices that will amply repay them for the care exercised. Members of the Experiment Association should be the prime movers in growing seed grains and be instrumental in their dissemination.

Manshury Barley.—Several members of the Association have grown choice Manshury barley during the past year and aided

in the dissemination of the same. The Manshury barley was introduced by the Experiment Station more than a quarter of a century ago, and was for many years the best yielding barley of the state. It gradually lost its identity and in many instances deteriorated. An effort has recently been made by the Station to improve this strain of barley and again disseminate it.

It seems that at least one hundred of the members of our Association should aid in this dissemination, and would find it profitable to grow this strain of barley in a careful way for seed purposes.

Harvesting Manshury Barley on the Grain and Stock Farm of Anton Cherovsky, Kewaunee, Wisconsin.

Swedish Select Oats (Wisconsin No. 4).—Six years ago the Experiment Station secured a variety of oats from the United States Department of Agriculture known as No. 2778 or Swedish Select oats. These oats had been secured by M. A. Carleton from the Russian government for trial purposes in the United States.

The Wisconsin Station secured six pounds of these oats in 1899 and compared them with other varieties then being tested. The results were so favorable that an effort was put forth to improve them by selection and careful grading of the seed for each season's crop.

In all comparisons with select varieties of oats, the Swedish were equal to the best in point of yield and had several desirable characteristics superior to other varieties.

These oats were sold to members of the Experiment Association for trial purposes in various counties of the state, who aided in their dissemination. No less than three hundred members of the Association grew these oats during the past season and nearly all reports received at the office speak of the oats in the most favorable manner.

A large number of farmers secured these oats from members of the Association and grew them in 1903 and '04. From numerous reports received it seems reasonable to believe that no less than four million bushels of these oats were raised in Wisconsin the season of 1904. Many thousand bushels of these oats are sold by members of our Association at good prices to farmers in nearly all cereal growing states.

The United States cercalist, M. A. Carleton, has declared these oats to be one of the best varieties grown in the United States. Many thousand dollars have been brought to our state from the sale of these oats besides the great good that has accrued from the increase production on account of their superiority.

Corn Improvement.—No one line of agricultural effort offers the opportunity for improvement as does that of corn. Wisconsin has one and one-half million acres annually planted to corn, the crop of which is valued at twenty million dollars. We raise thirty bushels to the acre with our mongrel-bred seed.

If we but raise our yield to forty-five bushels to the acre instead of thirty it will increase the wealth of the Wisconsin farmers $10,000,000 annually.

I feel confident that this can be done. Illinois has made great improvement in the past six years, and many of the corn growers of that state, by using pure-bred seed and good judg-

ment are securing yields averaging from seventy-five to one hundred bushels of shelled corn per acre.

With our fertile well-cultivated soils we can grow quite as much per acre as our sister states, if we but get standard varieties of corn properly bred and acclimated for different localities of the state. By securing good seed corn and properly selecting for uniformity of kernel, etc., a yield of seventy-three bushels of shelled corn per acre was obtained on the Station farm the past season.

Two hundred and seventy-six members of the Association carried on tests with corn the season of 1904, and interesting and beneficial information has been reported to the office which will be helpful in our future work.

Our great desire is to push the corn belt farther north, consequently we are in need of early maturing varieties that will ripen properly before the fall frosts.

Several varieties tested this past season give promise of becoming standard varieties for different sections of our state.

I think it well for several hundred members to join in the corn work and carry on tests the coming season. All seed corn should henceforth be sold in the ear, so that the purchaser can judge as to the merits of the seed. A ready market at good prices will always be found for good seed corn in the ear.

Prizes for Grains and Forage Plants.—To encourage the growing of pure-bred seed grains and forage plants and to ascertain the cereals of merit grown in the state, a fund was set aside for that purpose. Approximately two hundred dollars in premiums will be given to the successful exhibitors and all members have an equal opportunity for competing. It seems that this feature of the Association is an important one, as an opportunity will be afforded of examining the pure-bred varieties of grains grown by our membership and also to see those varieties grown in comparison. If better varieties are in existence than the varieties we are experimenting with, we desire to see them and use them as foundation stock for further improvement.

It seems to me that the Wisconsin Experiment Association has come forth in an opportune time and will be a great factor in making the state a seed grain center. By raising the yield

of all cereals several bushels per acre, combined with quality many million dollars will be added to the wealth of the state.

The following general data were taken from reports received at the office from members carrying on tests:

Experiment With New Varieties of Corn.

No members experimenting	276
No. members reporting	147
No. counties represented	49
No. reporting corn as maturing	40
No. reporting failure to mature	107
Maximum yield per acre, bushels	113
Minimum yield per acre	20
Average yield per acre, bushels	50.5

Experiments with Rape as a Forage Plant.—During the past four years extensive tests have been made in growing rape as a soiling and pasture crop. Rape is now so generally grown by our stockmen and so much has been said concerning its merits, that our tests were not so extensive the past season.

The following information secured from those testing rape will be of interest to many.

Total number reporting on all tests with rape 31

Four different tests were made in regard to methods of seeding as follows:

Rape sown with Drill.

No. members reporting	5
No. tons green forage produced per acre (average)	9
No. reporting good results in feeding	5

Rape sown with oats, according to directions.

No. members reporting	7
No. reporting good results	6
No. reporting no difficulty harvesting oats	6

Rape sown broadcast 10 or 12 days after sowing oats, then dragging.

No. members reporting	11
No. reporting good results	7
No. reporting detrimental effects from feeding	2

Rape sown broadcast on oats 2 to 4 inches high without dragging.

No. members reporting	10
No. reporting failure	5
No. advocating rape as a forage crop	7

Our principal effort has been put forth during the past four years in aiding in the eradication of oat smut. This work has been so effectually done that I believe we can now turn our attention to other lines of effort.

In 1904, five hundred members carried on tests in the eradication of smut. From reports received we find that where seed oats were treated in accordance with the formaldehyd method, and oats from the same lot sown without treatment, that in case of the treated oats, only 1–10 of one per cent of smut was noticeable, while in the oats not treated 4 1–2 per cent of smut was found, thus giving a net gain of 4 4–10 per cent in favor of the treated seed.

Tests with Swedish Select Oats.—Thirty members of the Association carried on tests with Swedish Select oats during the past season to note the yield in comparison with best varieties grown on the home farm, with results as follows:

No. of members reporting	30
No. of acres sown	352
No. of bushels raised	18,300
No. of bushels for sale	11,000
Average number bushels per acre of No. 4 oats	45
Average number bushels per acre of other varieties	40

Members of the Experiment Association are rapidly becoming the seed growers of the state, and by systematic selection and care in culture and otherwise, produce a fine grade of pure-bred seed grain. These seed grains are sold by the producers either in small or large quantities, at reasonable rates.

The following persons in Wisconsin have grown the Swedish Select oats (Wisconsin No. 4) during the past three years and can speak of their merits and can supply actual farmers of this and other states with choice seed for the coming year:

Name of grower.	Address.	County.
J. W. Stevenson	Rice Lake	Barron.
J E. Donnely	Dobie	Barron.
Gottlieb Muehleisen	Alma, R. F. D. No. 1	Buffalo.
John Knecht	Fountain City	Buffalo.
J. M. Leach	Hilbert	Calumet.
H. F. Cramer	Chippewa Falls, R. F. D. No. 5	Chippewa.
L. R. Guptill	New Auburn	Chippewa.
Wesley Raven	Bloomer	Chippewa.
D. L. Cowgill	Doylestown	Columbia.
Charles Rutter	Ferryville	Crawford.
Earl Gillispie	Kilbourn	Crawford.
Edward E. Benson	Mt. Horeb, R. F. D.	Dane.
Emil Dreger	Madison, R F. D. No. 6.	Dane.
R. A. Gillette	Verona	Dane.
Charles Lyman	Sun Prairie	Dane.
Otto Toepfer	Madison, R. F. D. No. 6	Dane.
Renk Brothers	Sun Prairie	Dane.
M. F. Peck	Marshall	Dane.
W. E. Bussewitz	Juneau	Dodge.
Edward Keogh	Algoma	Door.
H. W. Kent	Rusk	Dunn.
Theo. Isaacson	Menomonie	Dunn.
E. A. Donaldson	Eau Claire, R. F. D. No. 3	Eau Claire.
J. V. Langworthy	Augusta	Eau Claire.
P. J. Bonzelet	Eden	Fond du Lac.
Ray West	Ripon	Fond du Lac.
L. E. Hendrichs	Campbellsport	Fond du Lac.
E. E. McCormick	Lancaster	Grant.
Darley Dixon	Cuba	Grant.
G. A. Stivarius	Fennimore	Grant.
A. E. Barron	Cuba City	Grant.
E. D. May	Berlin	Green Lake.
H. O. Halgrim	Dodgeville	Iowa.
T. A. Strande	Taylor	Jackson.
W. E. Markey	Sullivan	Jefferson.
H. A. Tillotson	Bristol	Kenosha.
M. O. Myrick	Bristol	Kenosha.
Anton Cherovsky	Kewaunee, R. F. D. No. 1	Kewaunee.
C. Schroeder	Kewaunee, R. F. D. No. 3	Kewaunee.
Julius Moe	Holmen	La Crosse.
Ole C. Rood	South Wayne	Lafayette.
O. R. Weigand	Cleveland, R. F. D. No. 2	Manitowoc.
C. J. Hessel	Francis Creek	Manitowoc.
Joseph Reich	East Gibson	Manitowoc.
Henry Redelings	Marinette	Marinette.
David Swan	Wauwatosa	Milwaukee.
Francis E. Ebert	Tomah	Monroe
G. R. Downer	Appleton	Outagamie.
W. G. Jamieson	Appleton	Outagamie.
R. J. Schaefer	Appleton, R. F. D. No. 1	Outagamie.
M. Dineen	Cedarburg	Ozaukee.
Theo. Gustafson	Stockholm	Pepin.
John Charley	Ellsworth, R. F. D. No. 1	Pierce.
G. E. Grover	Junction City	Portage.
O. H. Knutson	Beloit	Rock.
L. L. Olds	Clinton	Rock.
W. C. Bradley	Hudson	St. Croix.

Name of grower.	Address.	County.
Stuart Mutch	Jewett	St. Croix.
L. P. Martiny	No. Freedom	Sauk.
W. L. Illian	Adell	Sheboygan.
William Toepel	Cleveland	Sheboygan.
W. L. Illian	Adell	Sheboygan.
John Bjorge	Whitehall	Trempealeau.
S. Houkom	Blair	Trempealeau.
J. H. McLees	Viroqua	Vernon.
Harry Dunbar	Elkhorn	Walworth.
Paul Meurer, Jr	Genoa Junction	Walworth.
J. C. Gould	Hartford	Washington.
A. B. Hicken	Waukesha	Waukesha.
E. L. Lobdell	Mukwonago	Waukesha.
Henry E. Rosenow	Waukesha	Waukesha.
Charles H. Schafer	Waukesha, R. F. D. No. 7	Waukesha.
A. B. Hicken	Waukesha, R. F. D. No. 7	Waukesha.
A. D. Larson	Waupaca, R. F. D. No. 4	Waupaca.
L. M. Rowe	Waupaca	Waupaca.
E. F. Heuer	Wautoma	Waushara.
R. F. Moody	Oshkosh	Winnebago.

GROWERS OF WISCONSIN SEED CORN.

Clark's yellow dent. (*Wis. No. 1.*)

Name of grower.	Address.	County.
J. M. Leach	Hilbert, R. F. D. No. 1	Calumet.
Melvin Thompson	Mt. Horeb	Dane.
Renk Brothers	Sun Prairie	Dane.
Louis Risum	Brodhead	Green.
George Morris	Ridgeway	Iowa.
T. S. Hamilton	Westfield	Marquette.
Lester Batho	Plum City	Pierce.
Harvey H. Miller	Evansville	Rock.
H. W. Bunker	Clinton	Rock.
Alfred Goodell	Reedsburg	Sauk.
J. D. Clark	Whitewater	Walworth.

Iowa silver king (Wis. No. 7).

Name of grower.	Address.	County.
Adolph Suhr	Cochrane	Buffalo.
Gottlieb Muehleisen	Alma, R. F. D. No. 1	Buffalo.
Walter Gerhardt	Neillsville	Clark.
W. H. Stantorf	Barnum	Crawford.
Fred P. Grebe	Randolph	Dodge.
H. A. Main	Ft. Atkinson	Jefferson.
Will Raichle	Frenchville	Trempealeau.
Otto Haass	Merton	Waukesha.
Arthur Rosenow	Oconomowoc	Waukesha.
Guy Treleven	Omro	Winnebago.

White flint.

Name of grower.	Address.	County.
M. O. Myrick	Bristol	Kenosha.
R. T. Wilkowske	Mishicot	Manitowoc.

North star yellow dent.

Name of grower.	Address.	County.
William Toole	Baraboo	Sauk.

Indiana yellow dent. (Wis. No. 5.)

Name of grower.	Address.	County.
Emil Dreger	Madison, R. F. D. No. 6.	Dane.

White cap dent.

Name of grower.	Address.	County.
J. M. Keys	Richland Center	Richland.
Stiles Brothers	Lake Mills	Jefferson.

Growers of soy beans.

Name of grower.	Address.	County.
R. A. Gillette.	Verona	Dane.
H. E. Rosenow	Oconomowoc	Waukesha.
O. C. Feathers	Manawa	Waupaca.

RAPE AS A FORAGE PLANT FOR SHEEP.

WM. F. RENK, SUN PRAIRIE, DANE COUNTY.

We usually sow from four to five pounds per acre broadcast and harrow in with a light harrow. In a favorable season on rich soil it makes a very rank growth and can usually be turned on when 12 to 18 inches in height. Do not turn sheep with empty stomachs on rape as bloat is liable to occur, especially if the rape is wet with rain or dew. Access to hay or straw while running on rape will lessen the chances of bloat. Occasionally sheep do not take to rape at first, and then it is well to shut them into the rape to get them accustomed to it. After once being used to eating it they make very good gains, but will do better and scour less if they have the run of a small patch of grass or pasture in addition to the rape. Rape alone will some times cause a part of the flock to scour. The most satisfactory results we ever got from rape, perhaps, was from a twenty-acre field sown to oats and rape sown with it. The season was a very wet one and the rape got ahead of the oats in some places. We succeeded in cutting all but five acres of this field. The oats yielded fifty bushels per acre and the rape was a sight to see. A short time after reaping we turned 150 lambs on this piece and they picked up a good share of the oats that we could not cut, and in connection with the rape made most excellent gains. It is not wise, however, to sow rape at the same time of sowing the grain crop. It should be sown a week later, then harrowed in lightly. We put in fifty acres in this way the past year and got most excellent results therefrom. Sown with grain two or three pounds per acre is sufficient.

Rape will mature when sown as late as August 1st, if the fall is favorable, and will then make very nice feed. In this way two crops can often be grown in one season by turning under rye pasture or growing a crop of early peas and then sowing to rape or by turning a piece of meadow after it has been cut.

Experiments also show us that an acre of rape in connection with pasture will produce over 400 lbs. of lamb mutton, at 4 cents per pound would bring $16.00 per acre, and at 5 cents per pound would bring $20.00 per acre. Not very bad compared with grain farming, labor considered, as there is no reaping, shocking, or threshing bills to pay.

Professor Craig conducted an experiment at the Wisconsin Station with 96 lambs, 48 on rape pasture and 48 on blue grass pasture, feeding grain in connection in both lots. In four weeks' time the rape fed lambs gained 50% more than the lambs on blue grass. After this the lambs were put in pens and fattened in winter for 12 weeks, and they found that it took 476 lbs. of grain for 100 lbs. of gain on the blue grass pasture, and 429 lbs. on the rape-fed lot. So the rape-fed lambs made 100 lbs. of gain on 47 lbs. less of grain, which shows the lambs fed on rape will make better winter feeders.

RAPE AS A FORAGE PLANT.

E. J. FRUIT, ARTHUR, GRANT COUNTY.

Mr. Chairman:

My experience on growing and feeding or pasturing rape is very limited, but I will try and tell what we have done with rape as forage for cattle.

We sowed a field to rape in April, 1903. In the way of preparing the soil we followed clover, the land being in a good state of fertility, first plowing the soil about five to six inches deep, then harrowing about three times and then sowing the rape by hand, the rate being about four pounds per acre. We

covered it with a harrow, but I believe it would have been better if it had been covered deeper. This could be done with a disk. We turned on after about six weeks, the rape being about 8 to 10 inches high. The cows and sheep seemed to do quite well; they had the run of a blue grass pasture at will, and we did not notice any bad effect from bloat as some thought we would.

I also have in mind a neighbor of mine who sowed a field at about the same time, who had very good success. He sowed a little oats with it which made a very good pasture for cows. He never had such a good pasture for milch cows, and there was no bad smell or taint in the milk caused by this feed. I think he sowed about one bushel of the oats per acre with the rape. The rape should be sowed quite early to get the spring rains.

The year 1904 we sowed about 40 acres to rape as we were plowing the corn over the last time. We sowed it ahead of the cultivator at the rate of 5 pounds per acre. This was by far the best rape we ever had, the land being in good shape and we covered the rape seed deeper than before, cultivating about three inches deep. We cut the corn off for the silo, this giving the rape more sunlight. We turned the cows on when the rape was about 8 inches high, this lasting 30 head, also 100 fattening lambs for six weeks. The cows did very well giving a good flow of milk. We were taking our cream to a butter factory at this time and there was no complaint from the buttermaker. When the rape was all eaten the cows were turned on good blue grass pasture and there was a decided falling off in milk.

I think that rape is a very good forage plant for Wisconsin, but the main thing for its growth is good land and plenty of moisture.

RAPE.

E. E. JONES, ROCKLAND, LA CROSSE COUNTY.

During the month of April, 1905, I received some Dwarf Essex rape from Prof. R. A. Moore, to carry on an experiment to find out its value as a hog pasture, when sown in connection

with barley. I can report excellent results, as we never had our hogs do as well at so low a cost as they did when pasturing on this mixture.

We plowed this land, which is a clay loam, in the spring, and sowed our barley, after having worked up the ground into good condition, and in a week or so sowed the rape seed. The barley was somewhat slow in starting, but the rape grew fast. However, the barley having had one week's start, kept ahead of it until we turned our hogs in.

When the rape had reached a stage that we thought was large enough, we turned our hogs in, for a few hours at the start, and then left them in all the time. We fed them a slop made up as follows: water, milks and shorts, and also fed some corn.

Every farmer should grow rape, as it is an excellent forage crop, and can be grown successfully almost everywhere.

We will always sow rape for our hogs. Some farmers think that hogs should do well on rape alone, and that is why some of them have made a failure of feeding rape. Several of our neighbors have sown rape in connection with oats and barley, and after these crops have been harvested, turn their sheep into those fields. The sheep pick up a great amount of the lodged oats and barley, and their gain in weight is phenomenal.

RAPE AS A FORAGE PLANT FOR CATTLE.

MINNICK ROOD, SO. WAYNE, LA FAYETTE COUNTY.

This crop makes a rank, succulent growth on good rich soil and is pastured off while green or is cut and fed from day to day as a soiling crop. The crop is not injured by frost, and when sown early gets well rooted before dry weather. When well established it will stand dry weather very well and the crop sown in the spring will furnish feed until hard freezing before winter, if the crop is cultivated, pastured and cut properly. If the forage is wanted only for spring and early summer use

the seed may be broadcasted. If it is not needed for summer but for fall, the seed should be drilled in rows eighteen to thirty inches apart so that cultivation may be given and the surface of the soil kept loose. The tramping of the ground by stock may be diminished to some extent by turning them on the rape patch for a short time twice a day. If rape is cut for soiling purposes it should not be cut closer than 4 inches from the ground or the plant will not start up quickly. If the growth gets ahead of stock and becomes stale and old it should be mowed and fresh growth will start. At times stock, especially hogs, refuse to eat the rape growing on a certain patch; the reason for this is not known.

Many trying the crop for the first time have concluded that it was not satisfactory. Precaution should be taken to not sow it on too wet or too dry soil. It is not used in this locality for soiling dairy cows because it taints the milk.

We were the first to grow rape, and the passers by used to say, "My, look at those rutabagas, how they grow!" and those same fellows say they will not try to grow hogs without rape. A neighbor of ours sowed it in his corn field and had good success turning his calves in the field. He bought one thousand sheep and turned them on rape sown in the corn field.

Rape can be used for silage if it is put in the silo. First, cut a layer of rape, then a layer of hay, then rape again, alternating. Allow me to urge upon every member of the Experiment Association to put in a patch of this succulent plant. Any waste spot around the stables will grow a good crop of rape. Any stock on the farm will dip into this rich, juicy, highly flavored diet in the fall of the year. Study the result and see if you do not reap a benefit and a profit from it.

RAPE AS A FORAGE PLANT.

H. E. Rosenow, oconomowoc, waukesha county.

In discussing the different methods of growing and feeding rape, will say that my experience with the plant has been chiefly

in growing it with the small grain crops. I have tried the different methods of growing it and find that one can get the largest crop by sowing with drill and cultivating the crop and then use it for soiling purposes, as by this method there is the least waste; we have also had a heavy crop by sowing it broadcast on rich soil and then mowing it as fed, and by cutting several inches high a second growth will quickly make its appearance. I have also tried sowing it with barley after the latter was about two inches high and find that if the ground had been rolled or packed very much by rain it is quite difficult to get seeds covered sufficiently, but one or two draggings will not injure the grain any at this time, instead it will work up a loose mulch and be a benefit. Rape sown in this way will not get large enough to cause any trouble with the grain and it will come on rapidly after the latter is harvested and make excellent pasture within a few weeks.

Have been growing rape for the last eight years and always mix not over one-half pound of seed to the acre directly in seeder with oats or barley, the latter being best in dry seasons as the oats are harvested later and do not leave as much moisture for the rape at just the time it is needed. If rape is sown at the same time as sowing the grain, it will be fit for feeding purposes much sooner than if it is sown a week later. In most instances where trouble is caused in the harvesting of the grain it is the result of using too much seed per acre, and occasionally on low ground, or if grain crop should lodge the rape will grow above the grain and then it may interfere with the cutting or drying out of the bundles unless it has been sown very thin, and for this reason one may always use more seed on the higher and poor soils than on low ground. Of course, rape will hardly compare with the clovers as a pasture plant, but the object of sowing it with grain is to secure pasture after the grain is harvested and it will also serve to keep down weeds and serve as a cover crop on the soil during the hot days of summer, and thus prevent a loss of nitrogen. Rape will produce more feed than clover the first year, because it will make better growth after the grain is cut, as at this season it is generally quite dry for clover to get well rooted and then make as much growth.

Our rape fields have generally been used as a pasture for dairy cows and in very few instances has there been any perceptable taint in the milk. I think taint is mostly caused by letting the cows feed too heavily on it at the beginning and then just before milking; possibly if the rape is not pastured till late in the fall, it may have more of a tendency to produce the taint than it would if fed earlier in the season. Excellent results have also been obtained by turning hogs out on stubble fields where there is a good stand of rape, they will pick up all scattered grain that would otherwise be waste, and by having rape, and water to go with it they will make great gains with but very little care or expense.

RAPE AS A FORAGE PLANT FOR CATTLE.

GEORGE Q. EMERY, STOUGHTON, DANE COUNTY.

A few years ago, while reading of the experiments conducted by Professor Henry at the Experiment Station, we concluded we would try sowing some rape seed with our oats.

We had a field, consisting of about 21 acres, partly clay and partly black loam soil inclined to moisture and in a high state of cultivation. On this we sowed twenty pounds of rape seed, costing $1.20. The rape seed was sown with the oats and germinated at about the same time.

The young plant has a strong resemblance to the cabbage plant, and, as this was the first that had been sown in the neighborhood, many were the people who inquired of us, how all those cabbage plants had come in our oat field. My mother, while walking over the field one day, pulled some of the plants, brought them to the house, wanting to know what new fangled thing had struck us now, that the whole oat field was covered with cabbage plants, and she wanted some planted in the garden where they belonged.

The season proved to be only a fair one for oats. They were not lodged badly, and the rape did not interfere very much at

harvest time. Immediately after harvest we had a good rain and in about four weeks the rape had grown to the height of about 2½ feet. At this time we turned in twenty head of cattle, ten of which were milch cows, and ten young cattle. Beside the gain in weight on cattle, we received $92.00 for milk; all from the investment of $1.20 in rape seed. We sold five of the young cattle to the butcher at the end of the period, and he often speaks of what fine beef they made.

The milk was badly tainted, but the manager of the creamery told us that as our cows were the only ones that were pastured on rape, whose milk was coming to the factory, it did not perceptibly affect the butter.

Since that time, we have found that by turning the cattle on rape in the forenoon and in another pasture in the afternoon, that no bad effect was left in the milk.

Experience has also taught us that rape seed sown with oats will often cause trouble at the harvest time on account of too heavy growth; and that it is better to sow rape seed about ten days after sowing oats.

One year we sowed strips of rape seed in the oat field, which had also been seeded to clover, and found that the clover seeding in the fall was invariably better on the strips of land where the rape seed had been sown. This we attributed to the rape shading the young plants after harvest.

A MIXTURE OF RAPE, SOY BEANS AND CORN AS A SILAGE CROP.

WM. L. ILLIAN, ADELL, SHEBOYGAN COUNTY.

Worthy members of the Experiment Association and Short Course Students:

As we sow about 100 pounds of rape seed annually for feeding purposes, I have often wondered as to whether it would not make good ensilage. But I had been informed that it would not, being too sappy. I thought, however, I would give it a fair trial, and experiment a little.

About seven acres of our last season's silage crop was planted with a mixture of corn, rape and soy beans, using 1½ or 2 pounds of rape seed per acre, soy beans about 1 peck to every bushel of corn. It was mixed and planted in one operation with a corn drill. A little rape seed should be added and mixed in at intervals (if the different seed is kept in one hopper), for the rape seed is small and will work to the bottom. By not putting in too much rape seed at a time, we succeeded in getting a fairly even stand.

Immediately after planting, the ground should be harrowed so as to get the field smooth, and free from the marks of the corn drill, before the tiny rape plants appear, otherwise they might get covered up during first cultivation. We worked the ground with a two-horse corn cultivator, and it worked well, the shields were lowered so as not to cover the rape and bean plants.

The field was harrowed several times before the plants appeared, and in this way the weeds were held in check. The rape and soy beans seemed to smother the weeds for they grew very fast and few weeds were noticed, the corn seemed to do fully as well with the rape and beans as without.

This mixture was cut and bound up with a corn harvester (Deering & Milwaukee), which did splendid work. At the time of cutting, the rape was from 1½ to 2 feet and over in height, so it worked up well with the corn into bundles, which were cut and run into the silo.

With favorable fall weather it again grew from 6 to 12 in. in height, after the corn had been removed, and so furnished good pasture late in the fall.

It seems to give a good flavor to the silage. We feed to cows, sheep, hogs, and a little to horses at present, they all eat it with a relish.

We use a variety of corn that matures early, and so there is no loss by leaves dropping off, of the soy beans.

It takes no extra time or land to grow and harvest this mixture of three crops, if the proper machinery is used, thus we try to "make two blades of grass grow where one grew before."

The three crops are uniformly mixed when they are grown together and cut into the silo, and it makes a very satisfactory feed for all farm stock, and we are well pleased with it.

I believe rape can be used in a limited quantity as a silage crop if mixed with corn and soy beans.

RAPE AS A FORAGE PLANT FOR HOGS.

C. H. ASHTON, BELMONT, LA FAYETTE COUNTY.

I have grown rape for the past five years for hogs and had very good success. Rape is the best pasture I have found for hogs. I sowed five pounds of Dwarf Essex rape per acre with one peck of oats, and harrowed twice after seeding. I usually turn my hogs on when the rape is about ten inches high. I have it fenced into two pastures and I turn them on one for a week, and then turn them on the other. By doing this way the rape is growing all the time and is better for the hogs. Hogs will make a good gain when pastured on rape. Rape is a cheap pasture. The seed can be purchased for about eight cents per pound. When sown in an oat field where the intention is to let the oats ripen it should not be sown for ten days after the oats. Then harrow once, very lightly. Rape is the cheapest pasture a farmer can have for hogs, therefore, it will be profitable for every farmer to raise rape for hogs.

TREATING SEED GRAIN TO PREVENT SMUT.

S. A. EASTMAN, SHEBOYGAN FALLS, SHEBOYGAN COUNTY.

The treatment of oat smut through the state of Wisconsin, as you may all know, is something that takes a great amount of time and energy of the different farmers. The smut travels from one farmer's field to that of another and the only thing for the farmers to do is to take the matter in hand and thereby destroy it. For the destroying of oat smut we need a small amount

of formaldehyd. This is a solution that costs about fifty cents per pint and when added to thirty-six gallons of water will be sufficient to treat 40 bushels of oats. Put the solution in a large tank, and submerge the sacks filled with oats for ten or fifteen minutes and then spread them on the floor where they will dry out. On account of the oats swelling it is necessary to sow more per acre.

I feel, by the farmers co-operating, the disease of smut will soon be out of existence and by so doing one farmer's smut will not be transferred to the fields of others.

TREATING OATS FOR SMUT.

W. J. STEINHOFF, PLATTEVILLE, GRANT COUNTY.

Shortly after I arrived home from the Short Course I spent a couple of days trying the experiment of treating oats for smut. I treated about thirty-six bushels and used the formula recommended by Professor Moore, which is one pint of formaldehyd to thirty-six gallons of water. I used two barrels and divided the solution so that two bags could be treated at once, or allowing one to drain while one was being treated. I allowed the grain to be submerged about ten minutes and after draining, it was placed on a large canvas to dry. The seed was sown and no change could be seen until a little before harvest, when a test was made and it was found that in the oats not treated there was seven per cent of smut, and in that which had been treated there was none to be seen. This goes to show that it is profitable for every farmer who has any smut in his oats to treat the seed oats before sowing.

TREATING SEED OATS TO PREVENT SMUT.

J. G. ZABEL, DEERFIELD, DANE COUNTY.

The treatment of oats for smut is still in its infancy in that part of Dane county in which I live. I am afraid that we farmers who are depending on our small fields of oats, for feeding our horses and cattle, are losing considerably by not adopting this treatment of ridding our fields of this fungous disease.

Any method that will increase the yield per acre from 20 to 30 per cent is no small feature and surely worth while trying, especially as its cost will not exceed from 4 to 5 cents per acre.

In making inquiries for the purpose of filling out the circular that was sent to me by Prof. R. A. Moore, I found that but few farmers had treated their oats, some of the fields that I took tests of were affected with as high as 25 per cent of smut, other fields had very little. The fact was also very noticeable that the straw in the fields containing a high per cent of smut was shorter and finer in stalk, while that comparatively free from smut had tall, strong and well developed straw.

In treating our oats two years ago we did not meet with very good success, owing to the fact that we spread the oats out on the floor and moistened them the best we could with the formaldehyd solution. This last year we took two barrels, setting one on a box high enough so the solution could flow from a hole into it, down to the lower barrel. The upper barrel was then nearly filled with oats and the solution poured over it until they were thoroughly saturated. The water was then drained all in the lower barrel, these oats were then emptied out on the floor and this method was repeated. I believe that this is the quickest and best method of treating oats, but it takes a little more solution.

I sowed some of these oats in a field adjoining one in which those treated by me the previous year were sown so they could be easily compared. A marked difference was seen in the field that I treated this year. The oats that I spread on the floor could not have been properly disinfected as the field showed

about three per cent of smut, while those soaked in a barrel were almost entirely free from it. This, I think, shows clearly that the oats must be thoroughly saturated in order to get the very best results.

TREATING SEED OATS FOR THE PREVENTION OF SMUT.

WALTER GERHARD, NEILLSVILLE, CLARK COUNTY.

Mr. President and Members of the Wisconsin Agricultural Experiment Association:

In past years the ravages of the oat smut in the northwestern states have been so great that many farmers were inclined to give up the growing of oats. A few years ago it was believed that formaldehyd, a powerful disinfectant, possessed the power of freeing cereals from smut fungi.

In view of this fact, several members of the Wisconsin Agricultural Experiment Association carried on tests for the prevention of oat smut by the use of formaldehyd.

I am one of the members of the Association who carried on one of the tests, I treated enough seed oats by the formaldehyd method to seed four acres. This is prepared by mixing one pint of 40 per cent formaldehyd in thirty-six gallons of water. This solution will treat about forty bushels.

The oats were put in a gunny sack and submerged in the solution from eight to ten minutes. Then the sack was lifted out of the solution to drain a few minutes, and then spread on the barn floor and shoveled over twice a day so as to dry them.

At seeding time I set the seeder to sow about one-half bushel more per acre than when seeding untreated oats, because the grains were swollen to some extent. The oats came up in a thrifty condition and grew well. I made tests for smut when the oats were beginning to turn and could not find any smut in the treated oats, while in an adjoining field of untreated oats I found it to contain 4 per cent of smut.

When we harvested the oats we found that the treated oats did not contain as much rust as the untreated. In 1904, 104 members of the Wisconsin Experiment Association made tests in 29 counties, and it was found that the untreated oats on the average contained 10 per cent of smut, which effected a loss of over two and one-half million dollars in Wisconsin. Would it not be a great advancement in agriculture by increasing the value of the oat crop two and one-half million dollars? This can be done by treating seed oats with formaldehyd.

TESTING AND TREATING GRAIN FOR SMUT.

GOTTLIEB MUEHLEISEN, ALMA, BUFFALO COUNTY.

As a rule we must treat diseases to prevent spreading and check the power of increasing. Some years ago the Experiment Station worked out a scheme to kill oat smut in our grains, which is worth a large sum of money, not only to the Wisconsin farmer, but to other states and countries as well. The prospects are that this treatment to grains affected with smut will be a great thing for the growers of grain in the future..

My last summer's experience has shown me that the farmers who stay continually at home have no agricultural paper nor any reports of what has been done. It is quite a job to get them started in progressive agricultural work. In my community I found that only about one out of ten knows anything about this,—at least that is about the figure that treat their grain for smut prevention.

Professor Moore sent me some blanks and requested me to make tests on oat fields. This matter came a little late, for the oats were already ripening, which is too late to make a close test, but had results as follows:

Thirteen fields tested, which varied from six to eighteen per cent smut. The farmer owning the one field testing six per cent, treated his seed oats by sprinkling it with this formaldehyd solution, but this shows that this method is not satisfactory. I

followed the formula given by the Station—one pint of formaldehyd of 40 per cent solution to thirty-six gallons of water. The grain was put in gunny sacks and soaked for ten minutes, then drained and emptied on a floor, not too thick, and shoveled over several times. It was then ready to seed the following day.

I sowed some oats treated and untreated along beside each other, same nature of soil, and the result was that the untreated grain showed a loss of 13 per cent, and on the treated side no smut was noticeable.

I will give a little example: Say we threshed 1,000 bushels of oats and lost 13% = 130 bushels. Let this be Swedish oats at 75c a bushel, would bring $97.50. For a few hours' extra work nearly enough money to pay one term in the Short Course.

I haven't said anything yet as to how I made the test. I used an ordinary barrel hoop, swung it in the field, and then counted the total number of stalks encircled; then counted the diseased, subtracted the diseased number from the healthy ones, divided the difference by the healthy ones, which will give the per cent of loss. I made a composite test in each field. I have also noticed that barley contains a high per cent of smut,—fully as much as oats, or more. I have not had any experience in that line yet, but as I understand it the operation is much similar to that of the oats, with the exception of a little stronger solution.

GENERAL DISCUSSION.

Mr. Moore: I made mention in smut bulletin 111 of the best method to destroy barley smut. I have carried on tests at the Wisconsin Station and I find the same solution used for oats is not sufficiently strong to be effective for barley. One pint of formaldehyd to twenty gallons of water is recommended for barley, and even this does not eradicate all the smut. There is something about the barley hull or the smut spore that is more resistant than that of the oat. I think the time is ripe now for a crusade against this barley smut and we must work out a thorough method of eradication of this disease. We had to educate people to eradicate the oat smut, and it will now only take a short time to have them eradicate the smut from their barley.

Wisconsin has become a great barley growing state, as you may know, and we have several choice varieties. Now, if we want to make Wisconsin the great seed grain state of America, we have got to work together and we must not put a thing on the market that is not up to the standard. Calls come in nearly every day for Manshury barley, Swedish oats, etc. When I refer them to growers of these grains, my reputation is at stake, as well as that of the college. If I tell a man in California or Ohio that he can get barley from certain members of the Association, I must have faith in the grower in order to refer purchasers to him.

R. A. Gillette describes his method of treating oats:

In speaking of treating seed oats for the prevention of smut, will say that I use two barrels, which I will call No. 1 and 2 respectively. Barrel No. 1 sets upon a box high enough from the ground so that an ordinary pail can be set under a spout which leads from the base of the barrel into the pail. The opening in the barrel into which the spout is fitted is covered by a screen on the inside of the barrel to prevent the oats running out through the spout. The barrel is then filled nearly full of oats and formaldehyd solution from barrel No. 2 is poured into barrel No. 1 until the oats are covered. It will take about 25 gallons of the solution to cover the oats in an ordinary kerosene barrel. Allow the oats to remain covered by the solution for the required length of time, then remove the plug which has previously been inserted in the tube and allow the solution to drain off. The oats may then be poured upon the floor to dry and the operation repeated until all the oats are treated. Several barrels may be used if preferable, and as rapidly as the solution drains from one pour into the next and so continue. The advantages of this method are ease of operation, rapidity, efficiency, and the simplicity of the outfit.

Mr. Moore: In former years when we took up the oat smut work, I cautioned parties treating oats to be very careful about letting any of the oats come in contact with the sacks or bins which had held smutty oats for fear of being contaminated with the smut spores. The smut spore is underneath the hull of the

grain and is practically the only germ we need pay much attention to, except those in closely adjoining fields.

The fact that formaldehyd would kill smut germs was discovered by a German and was put into practical use by Prof. Bolley, now of North Dakota. Professor Goff of this Station tried it on oats. Their method was to sprinkle. When the oat smut work was turned over to my department, I tried the sprinkling method to a certain extent. It would leave one or two per cent of smut in the oats under the most favorable treatment by this method. It seemed very essential to do a thorough job, and I observed that by sprinkling the oats the water would just run off and consequently the formaldehyd did not kill the smut germs. I concluded that the hull should be soaked with plenty of formaldehyd solution in order to eradicate all smut, so I put into practice the submersion method, which is familiar to you all and used almost exclusively throughout the state.

By doing a good job in treating our oats, we wipe out the smut in a single year. We have it pretty well under control at the present time.

The first year we made general tests throughout the state we found the oat crop affected to the extent of seventeen per cent. We issued 75,000 bulletins and sent letters all over the state, urging the farmers to treat their seed grain. Many of the farmers treated their seed grain and were pleased with the results.

The introduction of the Swedish oats not only put an improved variety of oats on the market, but it has helped to eradicate the smut also. Millions of bushels of these seed oats that were smut free were grown the past year.

Last year I found that no less than forty-five per cent of the parties I visited had treated their seed oats for the prevention of smut, or purchased from parties who had treated.

In regard to treating in the fall and then storing after treatment, will say that we did that here to advantage, although I think the most preferable time is just before sowing.

I have found certain sections of the state where farmers have not treated their oats for smut, but when they learn of the great good it is doing, they will either treat or purchase seed from

those who have treated, until we will have this work entirely under our control.

Mr. Beule: I have had experience in treating seed oats. I was convinced of the good that could be accomplished and wrote home about it. My people had trouble in treating thirty bushels, and concluded they would not treat any more seed. Later on I went out to see how much smut we had in the treated and untreated. The renter concluded that he would treat all oats sown hereafter.

Mr. Joos: I had some experience last summer that convinces me that it is necessary to treat our seed oats, and those should treat who raise seed oats. A short time before I got home, my father had ordered some oats from a firm in New York, the variety was Silver Mine. They were not treated with the formaldehyd solution. Well, the oats grew nicely and we thought they were all right. After they grew, I never saw oats so badly affected with smut. If we were to send out seed oats and have our customers receive such stuff as I got, we surely would not be doing justice to ourselves or the state.

EXPERIMENTS WITH SOY BEANS.

P. A. DUKLETH, MUKWONAGO, WAUKESHA COUNTY.

Observations have been made during the past three seasons on our farm in Waukesha county for the purpose of determining the value of soy beans as a farm crop when mixed with corn that is planted to go into the silo. The last season a trial was made by inoculating the soil with earth that contained the bacteria with which to start the growth of nodules upon the roots.

The soy bean, the chemist tells us, is very rich in protein and is one of the leguminous plants that has the ability to take free nitrogen from the air and store it in the so-called nodules that develop on the soy bean root. Knowing this to be true, we are deriving two benefits from one operation by raising the soy bean

on our farm, namely: first, to obtain protein for feeding stock, and second, to obtain some of the abundant nitrogen that is floating or passing over our fields every day during the growing season. And this is not all, we are securing two of the most expensive elements (if they had to be bought on the market), that make up the best food ration and that which is hardest to retain in our cultivated soils.

When the Secretary of our Association introduced this bean to the members it appealed to me very strongly that if this plant could be cultivated, matured, and harvested in our climate without extra and expensive machinery, we would have a plant that would help to obtain the much needed protein on our dairy farms, and also aid in raising the standard of our farms in soil fertility, which is to be considered of so much importance by all who endeavor to make the best and most out of the soil. Not only is the quantity of feed in the farm crop the sole value to be considered, but also the cost of labor, and the fertility that the farm crop exhausts during the growing and harvesting period.

Facing these conditions fairly and squarely we find that the plant that will give to us a quantity of feed that is high in quality and will not materially increase the cost of production from the labor standpoint, and, at the same time is restoring such plant food to our land that is of vital importance to success in growing any kind or variety of farm crops, is one of the crops that is the most profitable to grow. The clover is not only valuable for its high feeding quality to dairy stock, but mainly its value lies in the fact of its being capable of restoring and preserving our worn and hampered fields. This is brought about by the same method as in case of the soy beans, only to a less extent when such plants are grown with corn in rows. They will not cover so many square feet to the acre as the clover plant does when it is sown broadcast, but nevertheless, they will plant the same element in the soil wherever they are allowed to grow, providing the soil contains the proper bacteria to develop the nodules on their roots. All soils do not contain this species of bacteria for developing the nodules which was fully demonstrated in this year's experiment.

On a field where soy beans and corn had been grown the previous year two plots were inoculated with soil from this Station that had been treated or previously inoculated with soy bean bacteria. After the soy bean and corn mixture had been planted about ten quarts of this inoculated soil were sown broadcast by hand on these plots, covering a strip from one end of the field four corn rows wide and about ten rods long and the other in the center of the field about two rods long and four corn rows wide. The distance between rows being four feet. At this rate of sowing, the nodules were found developed in large clusters on the soy bean roots taken from the plots that had been inoculated whereas not a single nodule could be found on the many hundred plants that were examined through the field that had not been inoculated. In the row next to the treated one, only a few plants of those examined had developed nodules. This, however, may have been due to the fact that some of the treated soil may have been pulled over with the drag, as a smoothing harrow was run over the field after the inoculated soil had been sown, and possibly also some may have been scattered when the soil was sown.

During the first two years of the experiment the Ito San variety was grown with corn, this being the earliest variety of the soy bean family. The objections found with this variety have been mentioned in the previous reports of this Association, viz., that the bean matured too early, and practically all the leaves had dropped off before the corn was sufficiently matured to be cut for the silo.

The Medium Early Green was grown the present season. This variety proved to be better adapted for our climate and conditions as the bean reached maturity at the same time as the corn, grew a larger foliage and was fully as well podded as the earlier variety.

One part soy beans and four parts corn were mixed and planted with a two-horse Deere corn planter, dropping the seed about four inches apart in the row. The seed was planted at medium depth, germinated rapidly, and was above ground before the corn.

It should be remembered, however, that when the soy bean is to be planted on stiff clay soil, there is a danger in getting the seed too deep into the ground, especially if the soil has the nature of forming a crust. This is because the large cotyledons characteristic of this seed must be lifted above the surface before it becomes a plant.

When the corn and bean were sufficiently large to allow the man to follow the row, the cultivator was started. Some trouble was found when the shields were raised to allow some of the finer soil to be thrown towards the plants in order to cover over the tiny weeds that possibly had reached above the ground, because very frequently it would cover some of the bean plants. For this reason the shields had to be lowered and the best work with cultivators could not be obtained. After the bean plants had attained further growth there was no further trouble in cultivating.

The crop was cut September 21st to 28th at which time the beans had reached a height on the average of about two and one-half feet, were sufficiently matured and only a few of the lower leaves turned to yellow color. A Milwaukee corn binder was used for harvesting the crop and the bean plants were tied very firmly with the corn into bundles. Some of the lower pods, however, were left uncut, but if the power is available the machine can be tilted low enough so that only a small per cent of the pods will be left uncut.

This mixture after passing through the ensilage cutter was put into the silo.

This is the second year that the soy bean and corn silage have been fed satisfactorily to dairy stock.

GENERAL CONCLUSIONS.

1. That some soils do not contain soy bean bacteria for developing nodules on its roots.

2. Fields where soy beans are to be raised can be inoculated with earth that contains soy bean bacteria to start the growth of nodules on the roots.

3. The cultivator cannot be used to its full purpose as early in the mixed crop as it can in corn that is planted by itself;

therefore, fields where corn and soy beans are to be grown should be free from weeds when the plants are making their appearance above the surface.

4. The medium Early Green Soy bean in this year's trial has proven to be a better bean than the earlier varities grown in our locality.

5. That silage from this mixed crop has been very satisfactory.

SOY BEANS AS A FORAGE CROP.

NORMAN OVITT, BLACK CREEK, OUTAGAMIE COUNTY.

I will briefly give my experience with soy beans. I first planted soy beans three years ago on a piece of sandy loam that would have produced about 12 tons of green corn per acre. They were planted in rows 36 in. apart and about 3 inches apart in the row, cultivated and cared for practically the same as corn. The variety used was Early Black. They made a growth of vines about 2½ feet in height but on account of the very unfavorable season for late maturing crops they did not all ripen. However, we secured enough that were ripened for seed. Some of the pods grew so low that it was impossible to cut them with the binder; we pulled them and threshed them by hand.

My second experience with soy beans was two years ago when I planted an acre alongside on a rich, sandy loam. In fact, all the land on my farm is sandy loam. They were planted, cultivated and cared for the same as before, but the result was more satisfactory. We were enabled to cut them with a Deering corn binder and there were very few pods left on the ground. The yield was between 15 and 20 bu. to the acre.

Last season, I planted some with my silage corn inoculating the beans by tarring them the same as we do our corn to prevent the crows from pulling it, but instead of drying the tar with land plaster as we did our corn, we dried the tar

on the beans with inoculated soil sent by the Experiment Station.

We also planted two plots by themselves which were not inoculated, in all other respects the land, care and culture were exactly the same, but from the time the plants were two inches above ground the difference was clearly noticeable—the inoculated plants showed a more vigorous growth, had a better color and seemed to "come on" better in every way, while the yield of the inoculated plot was fully double that of the plot which was not inoculated, nor can this result be accounted for on the supposition that the land is deficient in plant food, for both plots were planted on the potato field where the yield of potatoes was over two hundred bushels per acre.

My opinion is that this being the natural way for leguminous plants to take their nitrogen, they will not do so well when obliged to gather their nitrogen from the soil, and my experience with alfalfa and vetches confirms this belief. .

The beans that I planted with corn the last season made a vigorous growth but was almost too ripe before the corn was fit to go into the silo, but made excellent silage. I am feeding it at present and find it much superior to pure corn silage. I think that the larger growing and later maturing varieties would give better satisfaction for silage. We are planning this year to plant soy beans with all our ensilage corn, also some for soiling purposes, and some for green feed in the winter to save the oil meal bill. I think my past experience justifies my planting them on quite an extensive scale but I will never again attempt to raise them without having the soil inoculated. I will also say that my experience with alfalfa has been a good deal similar to my experience with soy beans in regard to inoculating the soil.

SOY BEANS.

ARTHUR F. ROSENOW, OCONOMOWOC, WAUKESHA COUNTY.

Last spring we planted soy beans in drills and also sowed some broadcast. Those that were planted in drills, were planted

with an ordinary corn drill, and were planted about May 20th, these beans received the same cultivation that corn ordinarily would, and were harvested October 20, they yielded at the rate of thirty bushels per acre.

The beans that were sown broadcast were sown with a grain seeder, and the plants made their appearance in about eight days after sowing. Part of this field of beans was used for hog pasture and part of it was cut for hay. The hay was cut September 1, and after leaving it lay in the shade for a day, it was raked into windrows and cocked up in small cocks, where it was allowed to cure. The yield was from four to five tons of well-cured hay per acre. The hay seemed to be of good quality and was relished by milch cows better than good timothy hay.

The part of the field that was used for hog pasture furnished abundance of green forage. The hogs were turned in about September 1st, when the pods were quite well filled. The hogs ate up the pods, stems, leaves, and even the roots, and from appearances they seemed to make rapid gains and enjoyed the pasture very much.

SOY BEANS AS SEED AND A FEED FOR SWINE.

RUFUS GILLETTE, VERONA, DANE COUNTY.

I have raised soy beans three years and have tried at least six different varieties, with more or less success, and would recommend the following varieties for either swine pasture or for seed: Wisconsin Black, Early Black, and U. S., No. 94107.

These varieties are erect growers with me, bear a heavy crop of seed, and will all ripen in this vicinity. The first two varieties are quite early and on that account suit me best for swine pasture.

It should be remembered that soy beans are very rich in protein and need a large quantity of corn to balance the ration. Turning to the feeding tables in Professor Henry's "Feeds

and Feeding," you will find that 100 lbs. of corn contain enough carbohydrates and ether extract for a daily ration for a drove of hogs weighing 3,000 lbs., while it lacks 5.6 lbs. protein, which can be supplied by adding 20 lbs. soy beans. Taking the average yield of corn at 40 bu., the soy beans at 25 bu. per acre, it would require 4 acres of corn to 1 of soy beans to give a balanced ration if you intended pasturing both off on the field.

My observation leads me to believe that swine will waste very few of the soy beans if allowed to pasture on them (especially if they are an erect growing variety.) While swine take more readily to corn than soy beans, I have had no trouble getting my hogs to eat the beans, even when getting a good corn and middlings ration.

Inoculation Test.

My experience in inoculating the soil for soy beans has been quite limited, but I have tried it in a small way and believe it is one of the cheapest ways to get that highly prized fertilizer—nitrogen. Very few soils in the state will produce the nodules on the bean roots without inoculation. This can be done readily by getting soil from a field that has grown soy beans that produced nodules in previous years.

Summing up their good qualities in a few words I would say that they produce one of the richest protein crops that we can grow on the farm, are adaptable to a wide range of country, owing to the many varieties, suited for different lengths of season, different soils, different uses, and are worthy of a trial on any soil that will successfully grow corn or potatoes.

Soy bean experiments, as our Secretary has said, have not been taken up by very many students this year, but the experiment is one that I think ought to be taken up, as the soy bean is not only a good feed, but a good fertilizer as well.

The soy bean has about the same amount of protein as that of linseed meal.

A good many reports that came in stated difficulty in getting hogs to eat the soy beans, and I think one reason for this is one tries to feed them on too narrow a ration. Make a balanced

ration of corn and soy beans and you will experience no difficulty.

I had soy beans and corn and turned the hogs on the same as soon as the corn was well glazed, I left them in, so they had practically all the corn they wanted. I found the hogs relished the soy beans and did well on them.

I have tried at least eight different varieties in the last three years. The Ito San, Medium Early Green, the Early Black, Wisconsin Black, two or three brown varieties, and the U. S., No. 94107. The 94107 and the Early Black are the best varieties, I think, for our soil.

Question. Mr. Moore: Did you have any difficulty in getting the soy beans to develop the nodules?

Answer. Mr. Gillette: I got soil from the University, and where I used the soil they produced nodules in abundance.

SWEDISH SELECT OATS.

(Wis. No. 4.)

H. J. RENK, SUN PRAIRIE, DANE COUNTY.

Swedish Select oats are, perhaps, one of the best varieties of oats in the United States today. The U. S. Department of Agriculture says that they are probably the best American oats. Our Experiment Station has found them one of the best varieties for the past several years. With us we have found it strong and vigorous as a plant, having a dark green healthy appearance. I well remember the first year we grew it along beside our then best oats. As soon as they were up four to six inches any one could see the difference 80 to 100 rods off. The Swedish oats looked thicker, more vigorous and taller, while our own looked thin, shorter and more sickly, having a light yellowish appearance. I expect they were ashamed of themselves. At least they have had to go way back and sit down. As a heavy yielder it surpasses all other varieties we have ever grown.

An uncle of mine came and got some of the seed a year ago, and after threshing I asked him how it turned out, and he said he wished he had taken all that kind of seed as he would have threshed 500 bushels more oats, and most of the neighbors that helped him thresh wanted to get their seed oats there. He also said it took an extra man when they come to thresh the Swedish oats. He also bought one or two bushels of oats of a traveling agent, paying $2.00 per bushel I believe, and at threshing time he had it dumped in with his old oats, not thinking it worth saving for seed. It is not only a very heavy yielder but has a very thick berry with a thin hull, making it very desirable for feeding purposes. As it has a small percentage of hulls, it also has an advantage over other small berried varieties, as there would be less hulls in a bushel of large berried oats than in a bushel of the small. It also has a stiff straw and comes to maturity early.

Then we have six points in favor of these oats:

1st—They are a very heavy yielder.

2nd—They mature early.

3rd—They have a stiff straw.

4th—They have a thick berry.

5th—They have a thin hull.

6th—They have a smaller percentage of hulls than small berried varieties.

SWEDISH SELECT OATS

(Wis. No. 4).

W. E. BUSSEWITZ, JUNEAU, DODGE COUNTY.

It is a pleasure for me to say a few words in regard to the Swedish Select oats, which we have raised the last three years, with good success, having proved itself a profitable oat, and a heavy yielder over the common varieties. We have treated these oats for smut the last two years a few days before sowing, consequently the oats are smut free. The Swedish oat is a rapid grower and the difference could easily be noticed where grown beside our common varieties. The straw is stiffer, a

more even stand is obtained and they ripen a few days earlier. Two years ago the Swedish oats yielded 10 bu. per acre more than our other varieties.

The neighbors who tried it last year found it to be a better yielder than their common oats and giving good satisfaction.

The demand for seed oats last spring was very large. I sold nearly 1,000 bushels and could have sold many more if we had had them.

Last year the oats in this section were badly hurt by rust, but still the Swedish yielded 50 bu. per acre, while many common oats were from 10 to 20 bu. less per acre.

We will sow all of Swedish Select oats the coming spring the same as last year.

I hope they will be grown on every farm in the state in a few years.

SWEDISH SELECT OATS

(Wis. No. 4).

WM. L. ILLIAN, ADELL, SHEBOYGAN COUNTY.

Fellow Members of the Experiment Association and Short Course Students: I have now grown the Swedish Select oats for three years and can say that they are well adapted for our county and that they are the most profitable oats grown in our community. With us they have yielded as high as seventy and eighty bushels per acre.

We have our seed oats practically smut free, and can keep it so with very little labor and expense. I treat the seed oats for about two or three acres each year and keep the crop for the next season's seed oats. This does away with handling or treating fifty or one hundred bushels of seed oats each year. There is scarcely a trace of smut to be found in our oats.

As the kernels are large I usually sow from 2½ to 3 bu. per acre.

I think it will be the coming oat. Last year I sold over 700 bushels for seed, and this year I had nearly 1,000 bushels which I am again offering for seed.

We find that although the straw is coarse the stock take a liking to it, and eat it very readily, although they get sufficient other feed.

It outyields anything that I have seen.

It ripens early and so is not so apt to get rusty.

The heads are always large, upright and very bushy, kernels thick and plump, which gives the oats a fine appearance.

It ought to be tried on every farm where oats are grown.

TESTS WITH SWEDISH SELECT OATS (Wis. No. 4).

HERMAN OLSEN, CAMBRIDGE, DANE COUNTY.

Mr. President and Fellow Members: In the spring of 1902 I secured from Prof. Moore one sack of Swedish Select oats, which I sowed on one acre of ground. The season was quite wet but the oats yielded well in our locality.

The Swedish Select oats, compared with our former variety and also with the adjoining oat fields belonging to our neighbors, this season showed a marked superiority by a more vigorous growth from earliest sprouting, earlier maturing qualities, and heavier yielders than the other varieties.

The next season (1903) I sowed Swedish Select oats and our former variety again, taking care to keep varieties strictly separate. The season this year was so unfavorable for oats that the crop everywhere in our locality was exceedingly poor owing to a hard drought followed with scorching hot winds, which turned the still immature grain white and dead within a short time. The Swedish oats suffered like the other varieties, the kernels not being filled and when threshing came most of the grain was so light that it was blown like chaff into the straw. Even this year, I noticed the Swedish oats to be so much superior to the other varieties, along side of them, that I decided to carefully reclean this and sow no other variety the following spring; although the kernels were very weak and germination poor.

Last spring (1904) I sowed Swedish oats for the third time. From early spring the season was wet and, as the oats grew quite vigorously at first, about the time of heading out the crop became so badly affected by rust that it might almost be called a failure, but I noticed that all the neighboring oat fields were as badly damaged as the Swedish variety.

I will next spring carefully reclean the best of this variety and sow again, because I am convinced by careful comparison that it is superior to our former varieties in starting from the seed with a more vigorous growth, it has a stiffer and stronger straw, is earlier maturing, and will, under equal conditions with other varieties, yield more bushels per acre.

TESTS WITH SWEDISH SELECT OATS (Wis. No. 4).

E. D. EBERT, TOMAH, MONROE COUNTY.

Fellow Members of the Association and Short Course Students: In the spring of 1902 my brother obtained one sack of Swedish Select oats from Prof. Moore. The seed was sown with a broadcast seeder on one acre of very rich clay loam.

It stooled out well and had very strong straw standing about four and one-half feet high. It stood up well when other oats (the Silver Mine) on poorer soil lodged. The yield per acre was 60 bushels. We sold all we could spare readily at seventy-five cents per bushel.

In 1903 we sowed about 20 acres, which yielded 65 bushels per acre.

Last year we sowed thirty acres which yielded 65 bushels per acre, while other oats in the neighborhood only yielded from 50 to 55 bushels per acre.

The oats are very plump and ripen from three to six days sooner than our other oats. The neighbors that helped thresh said they were the nicest oats they had seen, and many ordered

seed for next year. I think from actual experience with the Swedish Select oats that they are the most satisfactory of any variety we have tried.

SWEDISH SELECT OATS

(Wis. No. 4).

HARRY W. GRISWOLD, WEST SALEM, LA CROSSE COUNTY.

Mr. President and Fellow Members of the Association: My experience with Swedish Select oats has been short and to the point. Hearing of the good qualities of these oats we bought 10 bushels in the spring of 1904. We sowed them with a broadcast seeder April 25th at the rate of 2½ bushels to the acre. On the remainder of the field we sowed oats common in our community. Before the oats had been up a week one could easily see the difference between the two fields. The Swedish oats were a dark rich green color and perfectly even, while the other oats were of a much lighter color and not nearly as even. People passing along the road constantly remarked that they had never seen a finer piece of oats. Both pieces rusted some and both pieces went down in the wind and rain. The No. 4 oats were ripe about three days before the other oats or 97 days after sowing. Both pieces were stacked and cared for in the same manner until threshed. The common oats yielded 48 bushels per acre, the average for our section, while the Swedish oats yielded 61 bushels per acre, or 13 bushels per acre more than the common oats. The oats were sold at a good figure to enighbors and to The John A Salzer Seed Company. In comparison with the common oats we found the Swedish oats larger and whiter weighing 36 pounds to the bushel. Here I have shown two fields of oats sown side by side at the same time and on the same kind of ground and the Swedish Select (Wis. No. 4) is the winner by 13 bushels per acre.

Field of Swedish Select Oats Grown by J. P. Bonzelet, Season of 1904. Yield, 42 bushels per acre, Eden, Fond du Lac County.

GROWING ALFALFA IN WISCONSIN.

H. F. ROSENOW, OCONOMOWOC, WAUKESHA COUNTY.

CUTTING AND CURING THE HAY.

Fortunate is the farmer who has a well-seeded field of alfalfa, and has succeeded in securing a good stand. In Wisconsin, but little had been done to bring the true worth of the crop before the practical farmer until a few years ago, and now we find in nearly every section in the state farmers who have at least a small field of this valuable hay crop, and one can truthfully say that it is the result of the untiring efforts of the members of this Association in co-operating with the Experiment Station. After securing a good stand, the next question before the successful grower is, which is the best way to utilize the crop and reap the benefits of the first year's outlay in cash and labor, whether to use in the field for pasture, or hay, and if the

latter, then the proper time for cutting and methods of curing the same.

Under Wisconsin conditions we have learned both from experience, and from the experience of others, that to pasture alfalfa means death to the plant, especially if pastured in the fall of the year, for both the hoofs and the grazing of farm animals work injury to the crown of the plant and will make it liable to winter kill. If one desires to feed it green, it should be used as a soiling crop and not for pasture.

Alfalfa grown by H. E. Rosenow, Oconomowoc, Waukesha county. Yield first season after seeding, four tons per acre.

Cutting.—Converting the green crop of alfalfa into hay is no doubt the best and safest way to utilize the crop and still not endanger the loss of the stand. Great care should be exercised in making the cuttings at about the right time, which is when the first blossoms appear, say when about one-tenth to one-fifth of the plants are in bloom. A mistake is often made, and I have made it myself, by letting the alfalfa stand until in full bloom, as this will retard the growth of the succeeding crop for several days, as will also cutting it too low to the ground. Therefore it is best, when cutting, to raise the guards up well from the ground for if alfalfa is cut at the proper stage, and not too close to the ground, it recovers readily, and a second

cutting can be expected in about thirty days. Three cuttings and sometimes four are obtained in a single season. Last season I made three cuttings and it gave a yield of about four tons of well-cured hay per acre. Unless the third cutting has been made quite early, I believe that for Wisconsin conditions the fourth crop should remain standing to insure a better winter protection.

Curing.—The first crop of the season is the heaviest and the stems are coarser, and thus harder to cure than the second or third crops, but the weather is generally more favorable for haymaking at the time the first crop is cut than when the last cutting is made, as hot weather is the best hay weather. If possible, a day that promises fair weather should be selected and the alfalfa cut during the forenoon and left to wilt in the swath, but never cut too early in the day before the dew has dried off. When the plants are partly dry, or if the day is fair, the alfalfa may be raked into windrows and put into small cocks in the afternoon.

Hay Caps.—Hay caps are a great help in the successful curing of heavy crops of alfalfa; besides the advantage derived from them in case of light, or even heavy rains before the cocks are again opened, an advantage is gained by their use, as applied to protect the cocks during the night, because they hold in the raked up warmth and keep the hay from cooling off during the night, thus not only improving it a little as to dryness, but it is ready to dry rapidly when the cocks are exposed to the air and sunshine, on being opened in the morning. The caps also keep the dew from settling upon the hay and thus prevent the loss of aromatic matters that would occur if dew was to dry off from hay. Ex-Governor Hoard remarked at the meeting of this Association last year, that we should not try to cure alfalfa hay without hay caps, and I think there can be no question as to the merits of caps, when properly used. They are nothing but square pieces of stout cotton cloth about forty-eight inches square, which are thrown over the cocks at nightfall. In order that the cloth may be kept in place, it has a string attached to each corner, which may be tied to a wooden peg, which is either pushed into the ground or into the cock itself, or the

strings may be tied to half horseshoes about two inches back from the end where cut is made, and this short end will then stick into the hay and prevent the caps from being blown off in windy weather.

Sources of Waste in Hay Making.—Hay making with alfalfa cannot be taught altogether from books, but growers should carefully study its principles underlying successful practice of handling the crop, as there is no more palatable roughage for farm animals than good alfalfa hay.

The principal loss in handling of alfalfa hay is in the crumbling of the leaves and finer parts of the stems, as they are about equal to bran in feeding value and thus great care should be exercised in curing and caring for the hay in the best possible manner. According to figures from the Colorado Station, we find that the leaves of the average plant will amount to from forty to sixty per cent; as many of the finer stems go with the leaves, the loss may amount to from fifty to sixty, or even more per cent. In a German experiment reported by Wolff, more than 7 per cent of the dry matter of lucern hay was lost during the process of curing the hay in the field. And it has been said in regard to the use of the tedding machine, "One great point in making hay is not to knock it about roughly when half made." Thus we see that in the proper curing of alfalfa or any other hay there is an important factor.

The other sources of waste in hay making are, First, the risk of washing by rain after the grass is cut and partly dried, whereby sugar, dextrine, and other soluble matters, including a quantity of ash ingredients, are dissolved and removed. Secondly, The development of fungi, if hay has been wet by rain, or if the natural juices have not been properly dried off. Third, during the process of making there is a loss of aroma which seems to be agreeable to cattle, in that the presence of it makes the hay more palatable. Fourth, the fading caused by exposure to direct sunlight, and from chemical consideration it is plain that these influences, which work to destroy the color and remove the aromatic matters would tend to destroy some of the nutritive constituents also.

Importance of Allowing Alfalfa to Sweat.—Although in opposition to the plan of making hay rapidly, many farmers maintain that in order to cure hay thoroughly well, it should be allowed to "sweat" freely while making, and this is especially necessary in the case of alfalfa or clover. The idea is, when mown grass is left in small heaps, the leaves will continue to transpire water, very much as they would do if the grass were still standing uncut.

So long as the alfalfa or grass of any kind remains alive, water will be exhaled from the pores upon the surface of the leaves, and water will thus be pumped out continually from the stalks of the mown alfalfa in a thoroughly natural way, much as if it were still standing. Whereas, if newly cut alfalfa were left spread in very hot sunshine, it might happen that the leaves would speedily be scorched to such an extent that circulation of moisture within them would cease, and transpiration of moisture from their pores become impossible. After the physiological appliances for removing water have been destroyed in this way, the moisture in the stalks can only escape by way of simple evaporation, and as that process is necessarily slow, there would be danger of carrying to the mow hay that really contained a large amount of water in its stalks, although it might seem to be very dry to judge merely from the crispness of the leaves.

In this point of view, the ideal plan of curing alfalfa hay would be as mentioned previously, only the cocks should not be allowed to remain longer than two or three days on the same place, as there is danger of smothering the plants underneath. Hay cured by being allowed to stand in the cocks two or three days, and being turned and thoroughly dried just before hauling, will not only keep better and be more digestible, but is also secured with less waste than hay that is made by spreading and which gets the effects of the elements.

And thus, I hope, that this coming year may mark greater success than ever before in the growing of alfalfa in Wisconsin.

ALFALFA AS A SHEEP FEED.

FRANK KLEINHEINZ, MADISON, DANE COUNTY.

Sheep owners in this state are urged strongly to grow more alfalfa for their sheep, especially in those localities where land is suitable for growing it. Green alfalfa is a splendid forage, because it can be cut about every six weeks. Under favorable conditions we can secure four cuttings in one season. It serves as green fodder for fitting sheep for shows and puts them in very nice shape without any additional grain or other forage.

In the summer of 1903 I saw a Southdown flock of sheep in Canada that was altogether fitted on a piece of nice green alfalfa, and they were in very fine shape for show purposes.

Alfalfa, if cut at the proper time and well cured, makes the best hay for sheep that I know of. Alfalfa stands up well, and will not lodge on the ground as red clover does, and therefore, makes a cleaner and a more desirable feed for sheep than any other clover hay. It is relished by sheep and a good deal of grain can be saved where alfalfa is fed.

Our Station has not as yet carried out any experiments as to the feeding value of alfalfa, but will in the near future.

From personal observation, I can say, that a man can almost see a bunch of lambs grow that are being fed on alfalfa.

In the year of 1903 a pen of five grade Shropshire wether lambs fitted for the International Fat Stock Show, were fed good second crop clover hay, which is one of the best feeds that a farmer can grow as roughage for sheep, won third prize at said show, as a pen of five, and weighed 598 pounds. A similar pen of five lambs fitted in 1904, received good alfalfa hay in place of clover and weighed 645 pounds. These lambs had such handling qualities and firmness of flesh, that they won the Grand Champion prize as a pen of five, over all breeds, grades and crosses shown at the last International. I am not able to give the weights of these two lots of lambs at the beginning of the fitting period, but as near as I could judge, they were about equal. It is barely possible that conditions of the

different years may have had some influence on the weights of these two lots of lambs.

While I believe clover hay is an excellent feed for sheep, yet in my estimation I think there is no other forage that will compare in feeding value with alfalfa.

ALFALFA.

LESTER BATHO, PLUM CITY, PIERCE COUNTY.

One of the first things to consider in getting a good stand of alfalfa is to get good seed. This can usually be done by sending to two or three good seedmen for samples. Then test them and order of the one from whom you got the best seed. The next thing is to prepare the ground in good shape. Commence by plowing deeply in the fall and disk until you have a fine mulch three to four inches deep.

A good seed-bed almost always insures a good stand.

Alfalfa is a plant that under favorable conditions will yield from three to four crops a year, for at least ten years. It seems to me we can well afford to give it careful attention for the first year or two. This can probably be done best by following a crop that has helped clean the ground of weeds, potatoes, corn, or peas are good crops to be followed by alfalfa.

Alfalfa must be on a well drained soil, as it will not grow well with wet feet, and it must not be where the water will stand on the ground, for if water stands on alfalfa from thirty-six to forty-eight hours, it is sure to kill it.

Alfalfa should be cut as soon as about one-tenth of the blossoms are out, for three reasons:

1. The next crop doesn't grow as well, if the first crop is left until in full bloom.

2. You lose more of the leaves in harvesting.

3. Analyses show that when cut when one-tenth is in bloom it contains 18.2 per cent protein; one-half, 17.2 protein, and when in full bloom, only 14.4 protein.

A ton of good alfalfa hay is therefore worth a little more than a ton of bran (wheat).

Alfalfa should not be cut too close to the ground, as you are liable to injure some of the buds. Therefore you should leave the stubble at least 1½ to 2 inches high. This can be easily done by tilting the mower guards up.

In curing alfalfa, do not leave it in the swath, but bunch it up in small bunches, and cover with hay caps for two or three days, then spread out and allow to dry, and then haul into the barn. The first cutting is generally the hardest to cure, as the stalks are usually coarser and harder to dry, and the rain generally bothers more at that time of the year.

Do not allow the bunches to stand too long in one place, as they will kill the alfalfa on which they stand.

GROWING ALFALFA.

J. P. BONZELET, EDEN, FOND DU LAC COUNTY.

It has been proved by repeated experiments that alfalfa can be, and has been successfully grown in our state. There is but little room left for doubt, that alfalfa is the most valuable forage plant that we have at the present time. All kinds of live stock greatly relish it, and do far better on it than any other hay that can be fed to them.

I have had experience enough with alfalfa up to the present time to know that as long as I shall till the soil, I will grow alfalfa. I am sure that it is the most profitable crop for forage that can be grown, as it will yield from two to four cuttings a year, and will produce more tons of good dry forage than any other plant, quality considered. For calves, sheep, and dairy cattle it has no equal, it also is a very good hay for horses, even hogs will relish it and do well on it. It is one of the very best feeds that can be fed brood sows.

I will give briefly my experience as to the best results in growing it in my locality in Fond du Lac county. The soil is

a fine clay loam rather heavy for the ideal alfalfa field, but in spite of that fact it does well and develops the root nodules abundantly, which is very important for its success. The first and most important thing to be taken into consideration is to select a field that is well drained, free from weeds and rich in fertility. After this has been done, the next step is to prepare the seed bed, a task which cannot be done in a hurry, as it requires a great deal of work. Alfalfa should never be sown on ground that has not been worked down fine enough for an onion bed. I have had good success with sowing twenty pounds of seed per acre. Perhaps more would not do any harm, but if the seed bed has been well prepared twenty pounds is plenty.

Alfalfa should not be sown until danger of frosts are over, for the young plants are very tender and would not withstand freezing without serious injury. I think that the most favorable time to sow alfalfa is in the spring. I have never sown any in the fall, so have had no experience as to what the result would be compared with spring sowing, but the Experiment Station warns us against fall seeding and I have followed directions.

A TRIAL WITH ALFALFA.

E. F. HEUER, WAUTOMA, WAUSHARA COUNTY.

I always like to listen to the experience of others, so I will also in a brief way tell about my trial with alfalfa.

Last spring I received a sample lot of seed both of Common and Turkestan alfalfa from the Experiment Association, also a sack of soil from the alfalfa plots of the Experiment Station.

Our soil is a dark sandy loam with a clay-gravelly subsoil and the plot where I sowed the alfalfa seed had raised a crop of potatoes the year before. This potato ground was not plowed but was disced well and was dragged several times making a very good seed bed. On April 28th I sowed the alfalfa seed. I sowed some oats as a nurse crop with a drill and

let the alfalfa seed run out broadcast so that the chains of the drill covered the seed. I did not drag it any more after sowing. The alfalfa came up nice and even. A couple of days after the small plants were noticeable I sowed the sack of bacteria laden soil sent for inoculation purposes on part of my alfalfa plot.

The plants looked very thrifty and grew fine and went into winter with a fairly good growth for winter protection. I could not notice any difference between the common and the Turkestan varieties. But there was a very marked difference between the part of the plot that was inoculated with the soil from the Station and the part which was not inoculated. The alfalfa on the part which was inoculated was always greener and grew more thriftily. When fall came on it was fully 4 inches taller than the part that was not inoculated and was fully one foot tall.

I cut the oats for grain. As a drought-resisting plant alfalfa will stand more dry weather than clover. I sowed clover with oats along side of the alfalfa in oats on soil prepared in the same way. During the two weeks of drought which we had last summer the clover dried out, but the alfalfa did not. I live on the divide between the St. Lawrence and Mississippi Basin in a rather high altitude which seems favorable for alfalfa.

While my experiment is of only one season's duration, yet the results are very satisfactory. The success of my trial still remains to be determined.

ALFALFA.

E. A. BEULE, FOX LAKE, DODGE COUNTY.

Members of the Association and Friends: Alfalfa is grown with more or less success in every state of the Union, I believe, and even with varying success in our own state according to the location, the soil and other conditions. What we are experi-

menting for at present is to determine the conditions which will make the growing of alfalfa a great success in this state, and secondly to give every one a correct knowledge of these conditions and the value of the plant.

The past season I gained my first real knowledge of the plant by carrying on an experiment with the common and Turkestan varieties, although I had watched with interest two plots near my home the previous season. The conditions under which the trial was made were probably more varied than is usually the case. I had selected a piece of land having a southeasterly slope for the trial. The soil is a black prairie loam with a gravelly clay subsoil. One end of the strip or plot was new land that had been cropped the previous year, the balance having been cropped a great many years. Part of it was fall plowed and part spring plowed. The alfalfa was sown May 3rd, 20 pounds of seed to the acre with oats sown 1½ bushels to the acre. The oats grew very tall and quite rank on the new land and finally lodged in two spots. They were left to ripen and when cut the alfalfa varied from two to ten inches in height, looked rather yellow and had made little or no progress since June 19th. Upon cutting the oats the alfalfa began to stool out, took on a healthy green color and grew rapidly. Where the oats had been lodged probably one-third of the stand had been killed. About two weeks after cutting the oats the alfalfa on the new fall-plowed land seemed to be just a little ahead of the rest. A little later our pasture being very short the cattle were turned on the clover seeding adjoining my alfalfa and they took very kindly to the latter. So much so that I thought there would be none left. The cattle were taken off and when the ground froze, my alfalfa stood about five inches high, but I think had been killed out some by the tramping of the cattle.

For the past two seasons I have also watched Mr. Geo. Maden's field of alfalfa quite closely. This field has a southern slope part clay and part loam and with gravel subsoil. The alfalfa was sown twenty pounds per acre without a nurse crop late in June after working the ground several times. The first year it was cut once to destroy the weeds, and this year Mr.

Maden cut three very heavy crops and could have cut a fourth but left this for a winter protection. As a feed for cows and calves he considers one ton worth three of timothy.

The second field is grown by Mr. Morris on blue clay having a southwesterly slope. The field runs to the lake and is from four to six feet above the level of the water. This was sown the same as my patch except that barley was used as a nurse crop. Mr. Morris clipped his alfalfa the first year and left lying on the ground. This year he made three good cuttings and had a good cover crop, but his stand is not quite as even as we should like to see. In my opinion alfalfa will not do its best on heavy clay soil.

GENERAL DISCUSSION.

Question. We had some trouble with rust, which checks the growth of alfalfa. It seems especially true in wet seasons. Is there anything to check this rust?

Prof. Moore. The thing advisable to do when alfalfa turns yellow and looks sickly is to cut it. The new growth will often look green and healthy.

Question. Does the alfalfa grow from the roots or not?

Prof. Moore. Alfalfa differs from other grasses; if cut too short it affects those little bulbs on top of the roots, which seems to retard it very much. The mower should be set so that the alfalfa stubble is left from one to two inches in height. Pasturing is also detrimental to alfalfa.

Question. Can we depend on a large acreage of alfalfa as a general crop?

Prof. Moore. Governor Hoard had thirty acres into alfalfa last year and was successful with his crop.

Waukesha county is an ideal place for alfalfa. I saw some fine alfalfa on the Kieckhefer farm last summer. One of the members of our Association put the alfalfa in there. Mr. Kieckhefer desires to put in sixty acres the coming year, as he is well pleased with it as a feed for his dairy cows. They have a large herd—from three to four hundred cows. We have got

the proper forage plant in alfalfa and there is no feed that you can get such large returns from as you can from this plant. On the Station Farm we procured approximately a ton of protein to the acre. Consequently we know that we have a valuable plant. It is almost equal to bran. Last season we grew five and one-half tons of alfalfa to the acre. It is easy to cut and it grows upright, and the hay is always nice and clean, especially if you use hay caps to properly protect the alfalfa after it is cut. If you want alfalfa for pasture, sow it especially for that.

Question. Has Grimm alfalfa been tried here?

Prof. Moore. I tried the Grimm alfalfa by sowing it on corn land that was not plowed, merely disked. I did not get a good stand. It was decidedly too thin. On the Station plots it did no better than the other varieties.

Question. How many years will a stand of alfalfa last?

Prof. Moore. It would be well to plow up and reseed in four or five years, as blue grass, white clover, etc., will begin to crowd it by that time. I think it well when the alfalfa field is plowed to plant the same to corn and the following year to put back to alfalfa, using barley as a nurse crop. The accumulation of the proper bacteria in the soil seems to assist in securing a good stand.

Question. Are the proper bacteria always present in the soil?

Prof. Moore. In most portions of Wisconsin I think they are already in the soil and the sweet clover has assisted us in establishing them. From careful test carried on at the Illinois Station, Dr. Hopkins found that the nodules growing on the sweet clover are practically the same as those found on alfalfa. Owing to the fact that in the southern part of the state we have an abundance of sweet clover, it seems that it is one of the chief reasons why no difficulty is experienced in getting alfalfa to readily develop the nodules. In the northern part of the state, where very little sweet clover is found, alfalfa does not develop the nodules so readily. Only a portion of the plants in fields throughout Marinette county seemed to have the proper nod-

ules. I wish to say right here that it is very easy to inoculate the ground by the use of bacteria-laden soil.

For soy beans we find that by putting some bacteria-laden earth in the planter after it is thoroughly mixed with the beans and sowing the mixture of beans and soil, we receive good inoculation. Scattering the bacteria-laden soil broadcast before last dragging is a very effective way of inoculating the soil; this should be done just previous to planting the crop. What applies to alfalfa applies also to the other legumes.

I have several tons of bacteria-laden earth for those who desire to carry on tests.

Question. I would like to ask Professor Moore if there has been any experiment along the line of whether the nodules will live in the ground when a crop is not growing.

Prof. Moore. It is known that the bacteria will live several years in the soil after the crop is removed.

CO-OPERATIVE LIVING.

O. M. STRAND, RICE LAKE, BARRON COUNTY.

Active practice of buying in the cheapest market and selling in the highest, without a common religion, common politics or daily association—and the thing is a success in a hundred places or more. The only tie that binds the society together is that of financial need. Aside from financial need each farmer in the association walks his own way. Rockwell, a small place in Iowa, is a place I will talk about and where they have made a success of this kind of a society.

Sixteen years ago the farmers in and about Rockwell decided to become merchants and grain dealers—to unite farmers and business. At that time Felthouse Brothers, reputable merchants of the place, practically owned and controlled all of the stores of the village, the coal and lumber business and the grain transactions. Whatever price they chose to make on

articles sold to the farmers or on grain and cattle or hogs purchased from them, stood. The farmer knew that at other but more distant points he could command better prices, but the long haul was against him, and the virtual monopoly created by these men and other capitalists behind them, prevailed. The situation was not any different than it has been or is in a thousand small towns here in our state, where, after a certain number of years' growth it turns out that one person or combination of persons possess all the wealth and power, and all the others have the experience and cause for complaint. Protestations from the farmers as to what they considered unjust treatment in the matter of prices met with no correction from the Felthouse monopoly.

Efforts of the farmers to place their trade with Mason City, with points on the B. C. R. & N. Railway, east of Rockwell, or in other directions, were unsuccessful, because of the inevitable long haul. The question became one of tamely submitting to a monopoly or of combating it.

There chanced to be a few men in the village of Rockwell who were strong enough in gray matter to have original ideas of their own as to how a monopoly might be opposed and conquered. They did not believe the legislature should be appealed to. They were opposed to theorizing. The idea from the start has been to fight the wrong use of money and power with the right use of money and power. The men and farmers of Rockwell organized on January 30th, 1889, what is, in the law and practice, nothing more than a large business firm, incorporated under the title of the "Farmers" Incorporated Co-operative Society." They gave notice to the monopoly that they proposed to fight, that with this firm they intended to drive it out of existence as a competitive concern. In this the Rockwell society widely departs from all "trust" characteristics. The general nature of the business of the society consists in buying and selling and dealing in all kinds of farm and dairy products, cattle, swine, sheep, poultry, dry goods, boots and shoes, groceries, hardware, farm machinery, lumber, wood, coal, stone, brick, all kinds of building material, grain and real estate, and dealing in all kinds of merchandise and selling

all such kinds of property on commission and otherwise. The capital stock was limited to not less than $7,000 and no more than $25,000. The shares of stock were fixed at $10 value each. No member of the society is permitted to own more than ten shares. Shares are paid for in cash or by giving a note, due in sixty days and bearing six per cent interest. Each shareholder has one vote in the conduct of the affairs of the society. The officers of this society are a president, vice-president, secretary, treasurer, business manager and nine directors. The directors meet monthly and the society annually. The society cannot subject itself to an indebtedness exceeding the amount of two-thirds of the shares of stock actually paid up. The private property of the members and shareholders is exempt from all the debts of the society, except to the amount of the shares of stock held by each respectively. The society can borrow money on the note of two-thirds of the officers and directors, but not to exceed $5,000. Dissolution of the society may be had at any time upon a two-thirds vote of all the shareholders. The by-laws they adopted are fully as interesting as the articles of incorporation. The officers of the society are elected by ballot. The directors and officers have the control and direction of the business of the society, and have the power to assess the shareholders according to the amount of business transacted by each shareholder with the society. An account of the stock is taken annually and a settlement had with shareholders at the same time. The funds of the society cannot be loaned to any person. Any practical farmer who may by purchase of, and payment for, one share of stock become a member of the society, may purchase and own to the extent of ten shares without the consent of the shareholders, but such shares shall not entitle more than one person to membership, and said "practical farmer" shall be defined as one who makes his living by farming, or one who has retired from his farm and is not engaged in any other business that will conflict in any way with the business carried on by this society, but others than practical farmers may, on consent of a majority of the shareholders, purchase and receive as many shares of stock, not exceeding ten, as may be allowed by the shareholders, but

said non-practical farmer cannot become an officeholder, and may be expelled at any time.

At the end of the year a balance of profits be found in the business of the society and sufficient funds are left to meet any and all liabilities of the society. Where accrued profits are not withdrawn at the end of the year they draw six per cent interest in favor of the shareholder entitled to them. The manner in which the salary of the business agent is raised and also payments of commissions insured. Assessments for the payment of the agent's salary is made by a percentage upon the sales or shipments made by members, and also purchases made by members through the agent. Also upon all purchases from, or sales to, or shipments for, those who are not members, each paying in proportion to the amount of sales or purchases, and including all sales made by members to other dealers than this society, and levied and collected by the agent at the time of the transaction, according to the schedule of rates the board of directors may adopt.

When this society started the private merchants fought them hard. They claimed that this society would drive them out of business, but they have not. They have compelled them to sell at a lower profit than before, but have increased the volume of their trade, increased the population of the town, raised the price of grain, brought in trading farmers instead of driving them out, and have not attempted to use the society as a money making scheme in itself. It makes money for the farmer members, but only enough for itself to meet expenses and carry a reasonable surplus for emergencies. They have had all kinds of trouble with the trusts but they have had to come and meet them half way at least. The Kansas City Grain Company is fighting them—that is the grain company backed by the Stickney crowd. This grain company informed the *agent* of this society that they were paying too high for grain. The combine informed him that they wished to maintain at least a two-cent margin on the grain purchased. The agent said that the society would not stand for such a margin—that it was too much—that the farmer was entitled to more profit, not to less. Then the combine said to him, "Very well,

we'll come to your town and pay more for grain than you offer and sell coal and lumber and salt for less than you do.' 'Good,' said the agent, 'that's just what we want you to do. Buy grain high and sell supplies low. That is the object of our society. Come and open up right at the door of the office of our society and we will be there when you are tired of doing it.' Then they changed their tactics, and said: 'Well we will go to competing railroads and through them compel the Iowa Central to shut down on handling your grain.' The competing roads are the Chicago, Milwaukee & St. Paul, the Mason City & Fort Dodge. But the threats have not yet been made good, and cannot be. If the society's price for corn, today, was 31 cents and the price of a competitive elevator, across the street was 33 cents, what would you do? I would send all our members over to the other elevator with the corn. They would receive 33 cents for it. Then they would give me one-quarter of a cent for each bushel sold. The result is they get 32¾ cents for their corn or 1¾cents more a bushel than we could pay; the society nets a quarter of a cent per bushel and the competing elevator foots the bill. Furthermore, before the members would sell to the competing elevator they would weigh their loads on the society scales, the scales which they purchased, scales which had not been tampered with. The business is managed just as a department store is conducted. Outsiders pay a higher price than members do, but still not as high a price as would be paid elsewhere. If an outsider came to this society for a reaper they can ship it and save five ($5.00) dollars for the outsider to pocket it.

Rockwell, according to the Mason City Times Herald, is handling more grain than any other interior point in Iowa. The people are prosperous. The motto of the society is, "Honesty among ourselves, small profits and large sales." Is the last not the key to the success of the Chicago department stores? On the surface there appears to be no reason why a society of this kind should not be organized in every county of the state of Wisconsin.

FARMERS' TELEPHONES.

WM. F. CURRAN, SECHELERVILLE, JACKSON COUNTY.

The farmers' co-operative telephone line is comparatively a new venture, but the benefits and advantages have proved so great that it has passed the experimental stage and is a decided success in many localities. The toll line men discourage any such venture on the part of the farmer, but we certainly can build our own lines cheaper than they will do it for us.

Organization has a great deal to do with the success of a co-operative line. Large companies are not advisable, as the officers, except the manager, are not salaried, and so the duties must not be great.

To show how a farmers' line may prosper, I can do no better than tell you of the experience we have had in my own locality. Two years ago a small company of us (sixteen in all) built about seven miles of line, the first in this county, and in this short time it has grown, till now we have eight companies, having 150 miles of line, 300 phones, connecting nine towns. In the towns referred to nearly all the business men have phones on our lines.

We organized our company in the following manner: First, we had an informal meeting for all who wished to become shareholders. We talked the matter over at this meeting, figured on the cost of building, material, etc. A time was appointed for a formal meeting, at which we elected the following officers: president, secretary, treasurer, and a manager, who was also line superintendent, and paid two dollars per day while at work.

As to cost, in our case each shareholder was to set fifteen poles, pay into the treasury the sum of ten dollars, and furnish and maintain his own phone, the same to be uniform.

On this first line we did a great deal of the work ourselves, hiring an expert to oversee the work and instruct the line superintendent.

We did not think it paid to use cheap material and the following figures will show the approximate cost of line per mile.

No. 1, 5in. 20 ft. cedar poles; 30 poles to mi. at $1.00 per pole	$30.00
170 lbs. No. 12 BB wire, at 4 cents per lb.	6.80
Insulators and brackets at 3 cents each	.90
Cost of building per mile	2.50
Total	$40.20

A line may be built cheaper by using oak or tamarack poles, and having the work donated, but it does not pay to get cheap phones, and it is not well to have more than sixteen on a line.

Our companies have centrals at all the towns connected, and these are paid by each member paying one dollar per year. This, with perhaps forty cents for batteries, is practically all the expense incurred in a year, as a good phone, with up-to-date lightning arrester, does not easily get out of repair.

We charge a small toll fee of ten cents to all outsiders who use our phones, and this toll pays for breakage in wire and switch board repairs.

As to the advantages of having a phone, will say that one must have a telephone in order to appreciate the worth and convenience of it. Surely, the farmer living at a distance from town and neighbors, is the one who needs it most and will use it to best advantage.

We find the phone especially convenient in the case of sickness when a doctor is needed immediately, or a trip may be saved by reporting the patient's condition. Then, there is the opportunity to get the grain and stock markets daily from your buyers in town, you may order repairs for your machinery, groceries from your merchants, hire any extra help, get the weather forecasts, and, last but not least, there is the social side, that is worth considering, especially in stormy weather or bad roads. Therefore, if you wish to make your farm home more attractive both to yourself and family, by all means, have a telephone, for it will surely save you money and help to pass away much dull time.

A CO-OPERATIVE TELEPHONE LINE.

W. J. GHASTIN, TWIN BLUFFS, RICHLAND COUNTY.

A telephone is something a farmer not only ought to have, but also needs. In the first place it puts him in contact with the city market. Second, if he should need some help he can step to his phone and call up his neighbors for information, and in this manner save, perhaps, an hour's time. Then again, he can get the election returns without leaving home.

Now, for the best and cheapest method of constructing a line of this kind. I think you will all agree with me that for the farmers in a given territory to co-operate and build their own line is surely the most satisfactory and also the cheapest in the end.

In starting this co-operation care must be taken not to be too economical. I recall to mind a company of this kind, which was started in my home county, these people were trying to have everything arranged as cheaply as possible so they got two of the farmers to attend the centrals free of charge. This worked very well for a while for it was a new thing for the women folks; but you may know that to operate the switch-board for over eighty phones will soon get to be work, and in about six months or a year you will be able to get central only about half of the time. The poles will commence to break and trees will become entangled with the line.

That is just what happened to the line I have reference to, for they had no one to look after and repair it. In less than two years the line was practically useless. This was one of their weak points, they had the line built, but had no means provided for repairing it. These farmers learned a valuable lesson.

First, never have a central without someone there to operate it day and night. Second, provide some means by which there will be somebody to look after and keep the line in repair. Then have these men make out written statements of their

bill and present them at the annual meeting, then the members will not only share the expense alike but can see for what they are paying the money.

Now, there must be some way of paying these people, who are attending the centrals, and I think that if there is a fixed price for people who want to use the line that are not members of the co-operation, that this will about pay the people who attend central.

The main thing in a farmers' co-operative telephone association or any other, for that matter, is for the members of the company to pull together and they will be sure to win at the end. In summing up the reasons why the farmers ought to co-operate, we have: First, to save expense; second, to make a strong company with some capital behind it. By buying a large number of phones or poles they can be secured at a lower price than when just a few are bought at a time. When it comes to building the line the farmers can donate a greater part of the work, such as hauling the poles or digging the post holes, and by so doing, cut down the expenses about fifty per cent.

CO-OPERATIVE CREAMERIES.

W. H. HANCHETT, SPARTA, MONROE COUNTY.

The days when the co-operative creamery might well be looked upon as a doubtful experiment are certainly a thing of the past, and I think I may safely predict that the time is at hand when it will be next to impossible for any other kind of a creamery to succeed in this state; for farmers are learning that it is not good business management on their part to allow a middleman's profit on the manufacture of their butter product.

From the very nature of the creamery industry, co-operation is made one of the most important factors which are necessary to success, for no creamery can meet with a full measure of

success without the hearty co-operation on the part of its patrons. Is there any good reason then why this necessary co-operation among the patrons should not extend to the full ownership, control, and management of the factory?

To be sure, many costly mistakes have been made and many picturesque failures have occurred, but these have only been the lessons which were necessary to educate the agricultural classes in better business management.

The few words of advice I have to offer regarding the establishment and management of co-operative creameries are culled, perhaps, from a rather limited experience in the business, and I shall therefore have to ask your kindly criticism.

The first subject of consideration in the starting of a co-operative creamery should be the needs of the territory from which you expect to draw patronage, and the number of cows available in that territory.

The professional promoter will tell you a territory with 200 cows will warrant the building of a creamery, but don't listen to this advice, unless there is a prospect for an immediate increase in the number of cows. Five hundred cows is the least number I should want to risk the building of a creamery for, and if several thousand are available, so much the better. A successfully managed co-operative creamery, however, always leads to the building up of the dairy industry in its territory, so it is sometimes permissible to start with less than would otherwise be advisable, provided there is no other creamery in the vicinity that can handle the business.

Never leave a co-operative creamery already established in your territory and build another, just because your advice is not given as much weight in the management of the one already established as you think it should be given. In all probability your advice would be discounted at the same rate in a new organization, should you succeed in establishing one, and one strong organization is preferable to two weak ones.

Regarding the extent of territory covered, a gathered cream factory can successfully gather cream over a territory ten miles in each direction from the factory, provided the roads are reasonably good.

It being decided that a co-operative creamery is to be built, the next step is organization. Let three or more leading farmers file articles of incorporation with the Secretary of State, and a committee of responsible men solicit subscribers of stock. Let the certificates of stock be of small denominations, say from $5.00 to $10.00, and urge patrons to take stock in proportion to number of cows they keep. When the required amount of stock has been subscribed, have a meeting regularly called to organize and elect officers. Employ a competent attorney to see that all necessary legal steps are complied with.

The next step will be the locating of the plant, and this is often the most perplexing question. Where the nature of the territory is such as to make only one point of location permissible, there is no difficulty, but where several points in the territory are equally advantageous, there is liable to be trouble, as the expense of hauling milk or cream to the factory is quite a considerable sum to patrons distant from the factory. In such cases it is generally advisable to have the expense of gathering paid by the factory and prorated to the patrons so that all may fare alike, regardless of location.

The building and equipping of the plant should be left in the hands of the Board of Directors, who would do well to visit several successful creameries and become their own architects, and then buy their equipment of machinery and appliances where they can do the best.

Never allow a promoter to work up the deal for you,—work it up yourselves and save at least one-third of the cost of your plant.

Whether the plant is to be a separator factory or a gathered cream factory may depend somewhat on circumstances, but I firmly believe that the gathered cream factory, rightly conducted is by far the more preferable for various reasons, prominent among which are, a much larger territory can be accommodated by a single plant, the cost of handling per pound of butter is much less, and the greater feeding value of the fresh skim milk on the farm pays the farmer well for the investment in a hand separator on the farm.

The plant once established, the Board of Directors should employ some one of known integrity and business ability, as business manager, whose duty it should be to take charge of all business transactions connected with the operating of the plant, keeping a careful record of the same and submitting it from time to time to the inspection of the Board of Directors, who in turn should render to the stockholders, at each annual meeting, a statement of the financial affairs of the association, with a summary of all the business done during the year.

Although I come before you with steadfast confidence in the co-operative creamery, I do not wish to lead you into thinking that it is all clear sailing and that there are no dangerous rocks and shoals in the path of the co-operative creamery which will at times demand your close attention and all your skill to avoid.

It would be vain for me to attempt to give you directions for avoiding them all, for many of them would be peculiar to your own locality and are questions which you must depend on your own tact and business ability to solve, so I will only give you a general outline in the way of business management.

The leading factor that goes to make success in the management of the co-operative creamery is the tact and business ability of its Board of Directors, so it is very evident that great care should be taken in their selection. As far as it is practicable, let each community from which you expect patronage have a representative. Let this representative be nominated by the community which he is to represent, and let the community be careful to nominate a man of known integrity and business ability, and above all things avoid factional fights, which are sure to come up, by setting aside contestants and electing a non-partisan.

Once you have a board of directors selected, be free to consult with them in matters pertaining to the welfare of the creamery, but leave it to their judgment and accept of their decision in all matters of dispute, remembering that they are human and with the rest of us subject to errors, and that mistakes will be made, and when mistakes do occur, just remember that there are none so hopeless as the man who never makes a mistake, and do not immediately inaugurate a campaign to

turn the rascals out, for if they are men of intelligence they are that much wiser for having made a mistake, and therefore their services will be of more value in the future.

One of the greatest mistakes co-operative creameries have made, I believe, is in turning out old officers because a mistake has been made and putting in a new set, for the most practical part of our education frequently comes to us through mistakes, and if your directors are intelligent men, they are also students, and their school bills you will have to pay, and every time you enter a freshman you have to go back to the starting point of school expenses.

Another important point is to employ only honest men as gatherers, so be careful about awarding a contract to a man for the sole reason that he is the lowest bidder, but first consider his habits and employ industrious, honest men. If possible, employ as butter maker, a graduate of the Wisconsin Dairy School, whom Professor Farrington can heartily recommend.

At your annual meeting quietly pour the cold water of your ballots on the devoted head of the chronic grumbler, who is always on hand with some sort of a partisan fight, which is inspired wholly by his selfish, suspicious jealousy. Nothing will squelch him quite so effectually as to be quietly ignored, while wordy war will add at least a cubit to his stature. Every controversy he can draw you into with his spiteful tongue, is both food and drink to his quarrelsome nature, and if you firmly but quietly withhold it from him, starvation soon reduces him to peace and quiet.

Another difficulty to be overcome is getting the cream and milk properly cared for on the farm. This will require a patient, persistent campaign of education among your patrons. One of the hard propositions to be met with in this regard is frequently the ones who need the education the most never get out to farmers institutes or read our Station bulletins and the only way to reach them is in their homes, and it requires a person of very great tact, sometimes, to reach them there, for the good housewife is liable to be sensitive in the matter of crisicism of her methods.

At Sparta, a little circular, with a few instructions regarding the care to be taken in milking and the care of milk and cream, is spread among our patrons. This is of great value and showed us our patrons were just as jealous of the reputation of the creamery, as were the officers, and were glad of the instructions contained in the circular.

To close with, let me say to you, with emphasis, that if as farmers you cannot successfully operate a co-operative creamery, hide that fact from the knowledge of your fellow men, if possible, for it is a blot on your reputation as peaceful, intelligent citizens of our great American Commonwealth.

SOME PROBLEMS IN CORN BREEDING.

W. A. TOOLE, PANSY HEIGHTS, BARABOO, SAUK COUNTY.

The novice in corn breeding will need first to select a variety and establish a standard towards which he will work. In his selection of a variety he may be attracted by the descriptions of kinds grown south of here, but sooner or later he will find that it requires too long a time to acclimate varieties grown very far south. He will also find that to secure the necessary earliness we cannot as yet grow a variety with as long ears or as great depth of grain as may be grown in a more southern district, so the standard for size of ear and proportion of corn to cob must differ for different latitudes.

As the corn stover is very important to the Wisconsin farmer, a variety which has good foliage should be sought for.

Careful discrimination is needed to select a variety early enough to mature in seasons like the last three, and yet late enough to give the largest possible yield.

The most promising variety in the neighborhood, possibly the one at present grown by the person wishing to improve his corn, will probably give the best results.

After considering the different points, I selected North Star

Golden as the best for the purpose of breeding a variety most suited to our needs. This variety had been grown by the family for over twenty years, without intentional crossing, consequently I was familiar with its good qualities. It is a dent variety of a bright yellow color, a good yielder, leafy fodder, and a small per cent of barren stalks. Its season is from 100 to 110 days. Several of the best ears were selected out of the general lot of seed corn, the seed from each ear being planted separately in a row by itself, the soil, cultivation, etc., being uniform for the trial plot.

So many differences were shown as to yield, time of ripening, etc., that a record was kept of each row, and several of the best ears from each row were saved to continue the breeding the next year.

To insure cross-fertilization, some recommend the detasseling of alternate rows, saving the ears for future breeding from the detasseled rows only. This I believe to be unnecessary, as but few kernels will result from self-fertilization, and the results which might be obtained from some very well-bred pollen on the detasseled stalks will be lost also.

The next year the seed from each ear was planted by hand, three kernels to a hill, in a block of several short rows, instead of a single long row, as some points, such as leafiness of fodder, may be better observed in this way. Some plots tasseled and silked out earlier than others, but this did not seem to be an indication of the relative earliness of the plots. Several of the earliest stalks to silk out were marked; these all formed rather short ears.

I believe the statement is made in a bulletin of the Illinois Experiment Station that barren stalks are more the result of an unfavorable season than of heredity, but from my observation of different varieties grown the same season, on similar soil, I am certain that some varieties are more inclined to a high percentage of barren stalks than others.

Corn which is badly down is very troublesome at cutting time. The first year of my breeding experiments, two rows which grew side by side showed a marked difference in this respect, one row being very badly down, the other with very few

down stalks. Practically no difference could be seen in the size of stalks. The second year the progeny of these rows showed much the same differences. This seems to indicate that a variety of corn may be bred up with less tendency to broken or down stalks.

As has been mentioned before, the corn stover is a very important part of the crop to the Wisconsin farmer. Besides being leafy, the fodder should keep green until the corn is ripe, otherwise it will lose in quality before cutting time. A careful comparison of varieties has brought out this difference strongly. The foliage of some varieties ripens and begins to deteriorate before the grain is sufficiently mature to cut, while the foliage on other varieties will hold green fully up to cutting time. The theory has been advanced that a leafy stalk will better stand extremes of climatic conditions. Though I have not as yet had a chance of especially noting this point, it seems very probable. I find that luxuriance of foliage has no relation to the time of ripening.

In the first year of breeding I noticed one row which had several stalks with two ears on the stalk. Being interested in seeing whether this tendency would be transmitted to its offspring, I saved two of the best ears from double eared stalks for planting the second year. While these gave a greater number of double eared stalks than the parent row, they did not yield any more double eared stalks than single ears of the same parentage. The ears were shorter and did not yield any more per stalk than single eared corn. There does not seem to be much advantage in breeding a variety with more than one ear to a stalk, and a single large ear is most generally preferred to more small ones.

We had always found the North Star to be a safe early kind, so I was somewhat surprised to find about ten days' difference in the time of ripening of different plots. As was touched on before the time of ripening is probably the greatest problem in Wisconsin. We must have a variety that will ripen in a wet, cold season, yet will yield well any season. The length of season which should be bred for can best be determined by experience.

We have noticed at different times where our field of North Star corn joined up to that of other varieties, planted at practically the same time, our own variety would stand a frost which badly injured the variety in an adjoining field. I did not notice any difference in this respect in the different breeding plots of the same variety, but I believe that with careful attention a variety capable of withstanding quite a hard frost might be bred up.

This would be a very valuable quality in seasons of early frosts, as often a damaging frost occurs, followed by good growing weather.

At the Illinois and other experiment stations, much attention is being given to breeding corn with either a high percentage of protein or oil. While this may be desirable in such states as Illinois, where varieties have been better developed as to yield than in our own state, in Wisconsin I believe this should not receive nearly as much attention at the present time as yield, earliness, and quality of stover. The yield of corn in Wisconsin may yet be greatly increased by careful breeding and cultivation, and until the limit is more nearly reached in this direction than at present, it will pay the Wisconsin farmer best to endeavor to increase his yield and seek his protein or oil in other crops.

In husking corn I have noticed that those ears filled out fully at the tips were not usually so long as the best of the ears not thus filled out. This leads to the thought as to whether it is wise to give to this point of covered tip much importance on the score card. The well tipped ear shows that it has reached the limit of its possibilities, while the ear not filled to the tip might be capable of further development in a year when the pollenating season is longer.

As we observe the growth of corn northward, we find that the corn kernels are shallower. In efforts to increase the yield, probably best results might be obtained by following somewhat the natural tendency of corn, as affected by climate, and this thought should be considered in judging corn grown in different latitudes, that all should not be scored from the same standpoint.

Corn judges in the more favorable parts of the corn belt have decided on a certain proportion of circumference to length of ear, which seems to be followed in the different sections where corn shows are held. Of the varieties I have observed grown in Sauk county, this rule of judging could not properly be carried out, the circumference of the ear being greater in proportion to the length than further south.

As the score card is primarily a means of directing our attention to an ideal ear, we should be careful to not attach too much importance to points which simply tend to the production of a symmetrical ear. There is always a tendency to give mere beauty of form more than its proper share of attention, at corn as well as stock shows.

Corn exhibitions will probably never reach the importance in Wisconsin that they do in Illinois or Iowa, as corn is not relatively so important a crop with us as with some other states. The corn exhibit will, however, be given more attention at our state and county fairs in the future than has been given in the past, but before a state corn show may be made the greatest possible success, the state will need to be divided into several districts, from which corn will compete only with other corn from the same district. In the southern tier of counties, many of the larger eared varieties, such as Leaming, may be grown. It is obvious that it would not encourage exhibits from the northern part of the state to be compelled to compete with the more southern grown corn.

Probably more grain would be made in the total yield of corn for the state if better cultural methods were followed with existing varieties, than by breeding better yielding varieties with no change in the manner of cultivation, but if an interest in corn-breeding is aroused among the farmers, more thorough cultivation will follow.

REID'S YELLOW DENT CORN.

A. E. HOWARD, WHITEWATER, WALWORTH COUNTY.

Fellow Members of the Association: I got a sample of the Ried's Yellow Dent from Professor Moore last season. The corn I received had very large ears and most of them were very good. The corn from all the ears except one germinated properly but at least half of the kernels on one ear were molded, so I could use ony one-half. The ground this crop was planted on was a piece of sod sandy loam. After it was plowed, I gave it a nice dressing, dragged it, and planted three kernels in a hill, four feet each way. It came up quite evenly, and I got a good stand. It was cultivated thoroughly all through the summer, weeds were kept out and it seemed in the fall that it did not ripen quite as early as the other varieties, but I left it stand and did not cut it at all and in the fall I kept picking out the ears that ripened first and fully three-fourths of it produced good sound corn. Some ears did not ripen as soon as others and I saved the ears from those that ripened first and showed up true to type. Received one hundred and twenty-seven baskets. When thoroughly dried out fifty-five pounds to the basket. The yield is much more than the common varieties of corn, and I think by selecting the ears that ripen first and those that show the best bred type and characteristics that we can get a variety of corn that will yield a much larger amount of corn and get ripe in the seasons we have in our section of the state.

LEAMING YELLOW DENT.

GEO. Q. EMERY, STOUGHTON, DANE COUNTY.

Having secured ten ears of Leaming Yellow Dent seed corn of the Experiment Association last year, we desired to give it a fair trial, but the position of our corn fields and those of our

neighbors made it impossible lest it become contaminated with other varieties.

However, the first of June a piece of land that had been too wet to plow early was sufficiently dry, and sixty rods from any other field of corn, was plowed and the Leaming corn was planted.

The corn proved to be a large variety, growing about ten feet high, with a luxuriant growth of leaves, but the frost killed it while in the milk. The corn was well eared and the ears were of good size, but my impression is that the variety is too late to be depended on in Wisconsin.

CLARK'S YELLOW DENT CORN.

R. A. GILLETTE, VERONA, DANE COUNTY.

Clark's Yellow Dent corn has given us very good satisfaction. We have found it comes to maturity very early, as early as Pride of the North, which has been the earliest yellow dent variety we have grown. And this alone is a very important point in this location where we have to contend with early frosts. It also is a good yielder, yielding considerable more than Pride of the North, having longer and larger ears. The ears are also very well filled at the tips and butts with a fairly thin cob.

The kernels carry their width well down to the tips giving it a strong germ and filling in well between the rows with a good length of kernel making it a very good sheller.

Have not found a white cob in our crop which has undoubtedly been bred out or nearly so, and do not know of finding two fully matured ears on one stalk. This too has been pretty well bred out and the corn produces only one good ear to the stalk. We find it breeds very true to type making it a very even crop with straight rows, close cobs, well filled at tips and butts, space close in the rows with good length of kernels, with a fair sized ear and a very good sheller.

For the first year's trial I must say that we are more than pleased with the Clark's Yellow Dent, and shall grow a large acreage of it next season.

INDIANA YELLOW DENT.

R. A. GILLETTE, VERONA, DANE COUNTY.

I tried Indiana Yellow Dent corn along with four or five other varieties. I find that it ripened as early with me as any other variety. I secured a variety of corn known as Murdock Yellow Dent. I got this corn from Ft. Atkinson and saved several good ears last year. It proved to be the best corn I had this year.

The Indiana Yellow Dent proved to be somewhat of a surprise to me. I put in one-half acre and thought it would not amount to much, but I secured a very large yield and it showed good breeding.

The best corn of the lot was the Silver King. It is a good corn for my locality, and I will try some another year.

INDIANA YELLOW DENT CORN.

EMIL DREGER, MADISON, DANE COUNTY.

Ladies and Gentlemen: Last year when I was attending the Short Course, I became interested in a yellow variety of corn known as "Indiana Yellow Dent," and at the end of the term I received seven ears of this corn, which I tried the past season, and must say that I was well pleased with the results.

I got two double wagon boxes full off from a little less than one-half acre, or at the rate of about 100 bushels per acre. The stalks averaged about eight feet high, and were very leafy.

The past season was not very favorable for corn in this locality, still this corn matured before frost, and the yield was larger than our native varieties.

EXPERIMENTS WITH SILVER KING CORN (Wis. No. 7).

ADOLPH SUHR, COCHRANE, BUFFALO COUNTY.

This experiment was made to see if the Silver King corn can be grown in the northwestern part of Wisconsin. The character of the soil was of clay loam, following an oat crop, and great effort was made to keep up the fertility of the soil. and great effort was made to keep up the fertility of the soil. cultivated crop five years ago. In the fall of 1903 it was manured and plowed to a depth of five inches, leaving it in such condition during the following winter. On the 20th of April, 1904, the time when the soil was in condition for cultivation, it was thoroughly disked and harrowed, and left until the 10th of May, for the planting of corn.

The seed was obtained from the Wisconsin Agricultural Experiment Association, and consisted of ten ears, each ear to be represented by a row. The rows were three feet eight inches apart and the hills the same distance in the row. The germination of the seed was very even, and appeared above ground the seventh day after planting.

The cultivator was set to work when the plants were from three to four inches high, and cultivated three times lengthwise and crosswise. The weeds that spread up near the hills were removed with a hoe, during the growing period of the corn. During the whole season it advanced in growth, large stalks, green, vigorous leaves, and a large number of suckers appeared, which were carefully removed as they appeared, leaving only three to four stalks to the hill.

Under these circumstances, the corn proved very satisfactory in my locality, both in maturity and yield. The corn was cut by hand and shocked the first of October, but it was slightly injured by September frost. After it was cured in the shock it was husked, and the yield estimated to be 70 bushels of ear corn per acre. It matured the same time our old varieties did, but it was planted ten days earlier.

The conditions were unfavorable for a mature corn crop, for the cool nights during the ripening stage made many farmers fail to select seed corn, and I highly recommend that it has given as good a crop, if not better, than any of the other varieties grown for ten years in my locality in succession. I believe that after growing the Silver King corn for a few years on our farm it will gain a high reputation in my community, for it was greatly appreciated by all farmers who passed by where the plot was located.

SILVER WHITE DENT CORN.
(Wis. No. 7).

FRED P. GREBE, RANDOLPH, DODGE COUNTY.

Last spring I received ten ears of the corn from Prof. Moore of this Station to carry on my experiment. The ground used in this experiment was a timothy sod, which had a light dressing of manure and was plowed in the fall, the nature of the soil being of a fine black loam containing a small portion of black sand. The ground was thoroughly worked up before the seed was planted and was also harrowed a few days after the seed was planted. The seed being tested gave a germinating test of 97 per cent. The corn was planted May 20th with a hand planter in hills 18 inches apart, 2 seeds in a hill, the rows being 3 feet 8 inches apart. The plants were first noticeable above ground six days after planting. The number of barren stalks were few, about 2.5 per cent. The corn was fairly well matured October 3rd when it was cut and put in shocks.

When I husked my corn I found one ear of a dark red color, which, of course, is objectionable in any variety of white corn, and as far as I could learn there was not a field that had any red corn within a mile of my field.

I made an estimated yield of about 135 baskets per acre, and in shelling the corn, taking 72 lb. of ears for a bushel, I got

59¾ lb. shelled corn, which would give me a yield of about 71.6 bushels of shelled corn per acre, while from the rest of the field of the common white dent I only got 56 pounds of shelled corn from 72 pounds of ears. This is due to the greater depth of kernel on the Silver King corn.

In the feeding value of the stalks I couldn't see any difference, as the stalks grew about the same height and had about the same amount of leaves to the stalk.

SILVER KING CORN
(Wis. No. 7).

ARTHUR F. ROSENOW, OCONOMOWOC, WAUKESHA COUNTY.

Last March when our school closed I took home with me ten ears of Silver King corn, which was planted the 16th of May. The corn was planted in drills and harrowed twice after planting. It was cultivated three times with a two-horse cultivator. The corn was harvested September 29 with a corn harvester, and when husked it yielded at the rate of 120 baskets of ear corn per acre. While we had a great deal of rain and cool weather, yet the corn matured well. I believe that this is a very promising variety of corn for Wisconsin, and especially for Waukesha county, and that in a good corn year that, if planted upon good soil, it will easily yield 100 bushels of shelled corn per acre.

TESTS WITH SILVER KING CORN
(Wis. No. 7).

C. H. SCHAFER, WAUKESHA, WAUKESHA COUNTY.

To begin with, I am sorry to say that I have not given the corn a fair chance in my experiment, first, because I planted it too late, and second, I had no suitable place available.

After having planted the other corn, I was at a loss to know just where to plant the Silver King so that it would not

become cross-pollenated. The only place available was a narrow strip of rich, black loam along the west side of an orchard, upon which there had been a crop of potatoes raised the year previous.

I planted it the early part of June in well prepared soil, with a hand planter, in hills three feet apart in the row, and the rows being four feet apart, planting from three to four kernels in a hill. I cultivated it four times with a Planet Junior walking cultivator, also hoed it, so that it was perfectly free from weeds.

The corn germinated well, there being scarcely a kernel that did not grow. It grew very rapidly, but was checked somewhat by the severe drought which we had in July, although it did not seem to affect it as much as some of the other varieties.

The stalks were strong and attained a height of from six to seven feet, having an abundant supply of leaves, thus making good fodder for silage. It ripens rather early, it being about as early as the King Phillip, and at least ten days earlier than the white flint, two leading varieties raised in my neighborhood.

There were one to three ears on a stalk, and three to four stalks to the hill. The per cent of barren stalks was very low. The estimated yield was about 115 bushels ear corn per acre.

DISCUSSION.

Mr. Taft: In regard to Reid's Yellow Dent, will say that I came from the same town as Mr. Howard and it seems to be a good clay loam soil that we have, and I thought my trial with Reid's Yellow Dent was a failure as I do not think I got an ear that was matured. We had a very poor season. I am very much interested to have the trial go on with this corn to see if we cannot acclimate it for our section of the state and get a good crop. I think it would be a good variety if we could only acclimate it.

Mr. Main: I would like to know how you can save seed corn if cut with a harvester.

Prof. Moore. If you are going to make a business of raising

seed corn you must not cut it with a corn harvester. Use your best seed for that portion of the field where you desire to save seed corn and pick this from the standing stalk.

Mr. Hubbard: Is the Reid's Yellow Dent that was sent out by the Experiment Station grown by the same party?

Prof. Moore: Yes. It comes from Funk Bros. and is nearer a pure bred seed corn than any other variety except the Leaming. It has been bred pure for fifty years.

Mr. Hubbard: Grown in Wisconsin?

Prof. Moore: No, in Illinois.

MEMBERS OF THE EXPERIMENT ASSOCIATION AND THE STATE FAIR.

JNO. M. TRUE, SECRETARY AGR'L BOARD, BARABOO, SAUK COUNTY.

The Experiment Association is beyond doubt to become one of the strongest factors in the agricultural development of the state.

Composed of young men who have deliberately and enthusiastically selected agriculture as a business; who have taken advantage of the special advantages offered in preparation of their work by our University Short Course in Agriculture; and who now in different parts of our state, under differing conditions of soil, climate and environment, are testing new methods and unsettled questions of the broadest agricultural interest; the result must be of almost incalculable advantage to our varied agricultural and live stock work.

You should take position, young gentlemen, in the front rank among those who are classed as representative farmers. You should not only be successful as farmers and live stock men, but broad intelligent citizens on public questions as well.

Whatever represents the spirit of progress and better work, you should champion; and your influence should be especially felt in advanced agricultural interests.

I feel that a lively interest on your part, in the State Fair,

would be mutually beneficial. We need you, and you can but be benefited by connection with us. Among our most successful exhibitors we number several young gentlemen from your ranks—Hill, Martiny, Renk, Jones, Moyle and others. Indeed, I have noticeed that when any of our young men enter the field as exhibitors, we seldom have reason to blush on account of their failure.

The Wisconsin State Fair is now in position to do good work. Its financial condition will enable it to largely increase its premiums to be offered next fall. The management will endeavor to make this fair an exposition of the peculiar breadth and strength of Wisconsin's grand resources.

The fair has been greatly aided in the past, by the exhibit of the University Dairy Department. The Horticultural Department has also contributed to our excellent exhibits of fruits. We hope for a continuance of this assistance. We are also anxious that the membership of this Association shall use the State Fair as a means of giving to the public illustrations of the good work it is doing, and we promise you our hearty co-operation in bringing about so desirable a result.

VALUE OF THE WEATHER BUREAU TO FARMERS.

J. P. BARTLETT, U. S. WEATHER OBSERVER, MADISON, WIS.

Ladies and Gentlemen: The weather bureau is a branch of the government about which many people know comparatively little. I will therefore try to give you a general idea of the work of the bureau before I mention the ways in which it is of special value to farmers.

The weather bureau is maintained by the national government at an expense of over one million dollars per year. It has fourteen hundred paid employees; besides these it has thirty-three hundred voluntary observers and, during the crop grow-

ing season, thirteen thousand crop correspondents, who serve without pay, their work being light and of benefit to the communities in which they reside. From its funds and with its employes the bureau maintains about sixteen hundred regular and voluntary weather observatories scattered throughout the United States.

The immense amount of work that is performed by the bureau is divided in several classes each of which is under the supervision of a Chief located in the Central Office in Washington. I will mention some of the more important of these divisions.

The River and Flood Service has charge of observing and fore-casting the heights of the large rivers of the country and of issuing warnings of floods. Along all the principal rivers are located river observers, each of whom has a gauge in the river from which he reads each morning the height of the river. He also measures the rain that has fallen during the past 24 hours, if any. Both of these results he then telegraphs to some central point where there is located a river forecaster. The latter, from the information received from numerous river observers, forecasts the future height of the river at points further down its course. These forecasts are often of much value. River steamers cannot run on many streams after the water falls below a certain stage. Other work along the river may be impeded by high water. Now a river usually begins to rise first in its upper portion. Heavy rains may occur or a thick layer of snow on the ground may melt rapidly under the influence of a warm spell of weather. This water slowly drains into the river tributaries and then flows into the main stream so that it may be a number of days after the rain falls or the snow melts before the high water in the river, or crest of the flood, reaches the lower portion of the stream. It is then possible to forecast these floods some time in advance and to tell almost the exact height that they will reach, so that property and people living on low ground may be removed to higher locations. Some of the larger rivers, as you all doubtless know, have at times very disastrous floods and many lives and much property are saved through warnings.

Another branch of Weather Bureau work about which you perhaps hear comparatively little is the Climate and Crop work. This is performed chiefly by the voluntary observers and crop correspondents each of whom makes his regular weekly report of crop conditions or monthly report of temperature and rainfall conditions to the Climate and Crop center of his state. In Wisconsin this center is located at Milwaukee. Here these reports are tabulated and studied, and weekly and monthly crop bulletins are printed for distribution to all interested persons. This work is of great value in keeping the public informed as to the growth of crops; it also furnishes data for determining the climate of the various sections of the country. From one of the monthly bulletins you may ascertain at a glance how much rain fell and what the temperature was on any day in any portion of the state; from a series of these bulletins, covering several years, you may learn quite accurately the general climatic conditions of any section. This should be of considerable value to farmers. If you wish to purchase a farm in any portion of the country about which you may know little, you do not have to take the word of any dealer in real estate as to how hot the summers, or how cold the winters are there, or whether or not the rainfall is sufficient for certain crops. From these government bulletins you may learn for yourself the exact climatic conditions of the place. For this reason it would not now be possible for that catastrophe to be repeated which occurred years ago in the western portions of Kansas and Nebraska where thousands of farmers, lured there by reports of fine crops, were ruined by several consecutive dry years.

Another very important branch of the Weather Bureau is called the Forecast Division. This has charge of all the weather forecasts and the storm, frost and cold wave warnings which are sent out. The forecasts are issued twice a day, once during the forenoon and again in the evening. The morning forecasts are made public by means of telegraph and telephone messages, weather maps and forecast cards delivered by mail. The evening forecasts are furnished chiefly to the newspapers though they may also be sent out to farmers by rural free delivery slips. Warnings are distributed by about the same methods.

Storm warnings are issued only along the sea coasts and over the Great Lakes where they are of great value. It is estimated that one storm along the Atlantic, if no warning were given, would cause three million dollars worth of damage. On the Great Lakes, before the establishment of any storm warning system, whenever a severe storm passed by many lives were lost and the shores were strewn with wrecks. A wreck there now is comparatively rare.

Warnings of cold waves are also very important. Much perishable property may be saved if people know in advance that there is to be a sudden and severe drop in temperature. In one cold wave in January, 1903, it was estimated that millions of dollars worth of property was saved through the warnings issued.

The frost warnings sent out by the Weather Bureau are also of great value to certain interests. Along the Atlantic coast they plant truck at nearly all seasons of the year. Beginning in Florida in midwinter they plant farther and farther north as spring approaches. This early truck brings high prices in the northern markets. So the growers take risks, by planting before the danger of frost for their section is past, in order to get their crops into market early. When their crops are just above ground, if a frost is predicted, they will go to considerable expense to protect the young plants, and are very glad to obtain warnings from the Weather Bureau a day in advance. Fruit growers are also interested in frost warnings. Here in Wisconsin the cranberry growers in the central part of the state benefit considerably from the frost warnings issued.

The chief ways in which the farmer may be benefited by the Weather Bureau are through the daily weather forecasts and the frost and cold wave warnings. The forecasts are of interest to almost everyone, and especially to the farmer who is much exposed to weather changes and whose prosperity is largely dependent upon his taking advantage of sunshine and rainfall, each at its proper time. The daily forecast should be of especial value at times of seeding and harvesting when too much or too little sunshine or rain may make material differences in

the crop results. Frost warnings are of much value to certain classes of farmers. Cold wave warnings enable the farmer to protect his stock and to take steps for the comfort of himself and family during the extreme cold.

One of the greatest difficulties that the Weather Bureau has in benefiting farmers is in reaching them with the forecasts and warnings in time to have them be of value. In the city it is very easy to give out weather information, especially through newspapers which, in some cities, come out with a fresh edition each hour; also by frequent mail deliveries. But farmers are often remote from newspapers and postoffices and are therefore difficult to reach. The ideal method of warning them of weather changes is through the farmers' telephone lines over which the forecasts can be given them almost as soon as the latter have been prepared. Rural free delivery slips are much used for distributing forecasts to farmers; about 100,000 of these slips are now printed daily and sent out over the various rural free delivery routes.

Doubtless you are all familiar with the weather maps and card forecasts which we issue. About 25,000 of the former and 75,000 of the latter are distributed daily. The cards furnish a forecast for a definite locality and period of time. The maps are of more value, however; from them, after some practice, one can make a forecast for any section and for as far in advance as they see fit, of course, with the understanding that the shorter the range of the forecast, the more reliable it is. The maps also furnish much information as to the weather over the United States during the past 24 hours.

(Weather maps for two consecutive days were distributed at this point.)

In ordinary conversation people speak of the weather as being fair, sunshiny, cloudy or rainy. From a scientific point of view there are certain properties or conditions of the air which we call the weather elements. These elements are: air pressure, air temperature, air moisture, cloudiness and precipitation. For determining the value of these elements we have certain instruments. For measuring the air pressure we have

barometers, and as the pressure of the air becomes less as we ascend it is necessary, in order to make the observations at points of different elevation comparable, to reduce the barometer readings to some common plane, usually sea level. For measuring air temperatures we use thermometers. We have gages in which to collect any rain or snow that falls. Other instruments are used for determining the direction and velocity of the wind. It is of value to notice the amount and the movement of clouds, but this is usually done with the eye, without the use of any instrument.

In taking an observation we simply measure the various weather elements; we observe the temperature as shown by thermometers, read the air pressure on the barometer and reduce this to sea level, note the velocity and direction of the wind and the amount and motion of clouds (this latter is quite important as indicating the direction of the upper air currents), we measure the rain or snow fall, if any. Observations in the Weather Bureau are taken at 8 a. m. and 8 p. m. (75th Mer. time) daily throughout the country. As soon as the observation at each station is completed it is put into a concise cipher for telegraphing. Here is an example of an enciphered observation: Madison figary huzzzing rigor bugaboo. This telegram would convey the following information in regard to the weather at Madison at the time at which this observation was taken:

Air pressure, reduced to sea level, 30.10 inches.

Temperature, 42 degrees.

Direction and velocity of wind; west, 10 miles.

Rainfall during past 24 hours, .02 inch.

Highest and lowest temperature during past 24 hours, 48° and 42.°

After being enciphered the observations are telegraphed over circuits, each report being copied down at a number of different offices as it passes over the wire. The observation reports are thus exchanged among the Weather Bureau stations so that each station receives cipher reports from other stations all over the country.

When these reports are received at a station they are deciphered and the various weather elements are charted on an out-

line map of the United States, each at its proper place. Lines are then drawn to pass through points of the same temperature; other lines are made to pass through points of equal air pressure. The sections where this pressure is highest are marked with the word "HIGH" and where it is lowest with the word "LOW." By means of the stencil process these lines, words and some symbols to represent weather conditions and wind direction are transferred to the ordinary weather maps with which you are familiar. Now, looking at these maps which we have, the lines indicate to you the temperature and air pressure of the various sections; the arrows show the wind direction; you will notice that the wind blows toward the places where the pressure is low and away from where it is high. Now, these areas of high and low pressure move across the country in a generally easterly direction at a rate of about 600 miles a day, although this rate varies much at different times. High winds, with rain or snow, usually precede the Low area, and come from the south bringing higher temperatures. When the center of the Low passes to the east of a place the wind shifts to the west or northwest bringing lower temperatures. These changes in temperature and wind direction also move across the country from west to east, accompanying the areas of high and low pressure. This is the fundamental principle of weather forecasting; the general movement of weather conditions toward the east. If you wish to know what the weather will be at a certain place tomorrow, study the weather conditions to the westward of that place today. Like all rules, this one has exceptions. Frequently the weather conditions do not move directly eastward but move to the northeast or southeast and at an increased or diminished speed. Also the atmospheric effects which the areas of high and low pressure produce in passing over a place vary in different parts of the country. Men who make a study of forecasting usually have certain rules upon which to work, which they have derived from critical study of the maps. Professor Willis L. Moore, Chief of the Weather Bureau, was at one time Forecaster at Milwaukee, and he developed certain rules for forecasting the weather in Wisconsin

from the weather maps, as follows: "The maximum heat of summer occurs in Wisconsin after the center of low pressure has passed a little to the east, and southwest winds are blowing. The easterly winds from the lake are, of course, cooler than southwest land breezes.

"A Low from the northwest that reaches western Minnesota and western Iowa without rain or clouds will pass over Wisconsin as a dry Low, unless the isobars run closer than five-eighths of an inch.

"Light frost will occur on clear, quiet nights in the cranberry marshes when minimum temperatures at Duluth and La Crosse fall to 40 degrees and 45 degrees, respectively. When these stations record five degrees lower the frost will be killing in the cranberry marshes, and light in the tobacco fields to the south; provided that well distributed rain has not fallen during the preceding 24 hours, and that the wind does not exceed eight miles per hour. If there be an even covering of moist soil, the temperatures at La Crosse and Duluth must fall to about 24 and 36 degrees, respectively, before killing frost will form in the interior of the state.

"No frost will occur in the counties bordering on Lake Michigan unless the temperatures at the Weather Bureau stations fall very close to the freezing point, such is the influence of the lake in slowly radiating heat and in keeping up the night temperature."

The foregoing illustrate what may be learned of forecasting the weather for any section by studying these maps. Of course, it is not possible to always make absolutely accurate forecasts, even with much experience.

I believe every farmer should have some scientific knowledge of the weather, for it has a very great influence on his success and prosperity. If he is unable to take a regular course in the subject of meteorology, he would do well to read carefully some one of the elementary works on the subject, such as that by Waldo. The knowledge that he would thus gain would enable him to better understand the weather map as well as to interpret more correctly local weather signs. We are endeavoring

to supply every community that can be conveniently reached with the weather map or with card forecasts. We are always glad to arrange to furnish these to parties who will agree to display them for the benefit of the public.

DISCUSSION.

Mr. Curran. Now, it seems to me one point that ought to be considered is that the forecasts which are sent out, should be sent out to the farmers, telegraphed to the central and telephoned over the different lines. Now, that was not brought out.

Mr. Bartlett. I meant to say something more definite about the sending out of the weather forecasts by telephone. Here in Madison we have arranged to give the forecasts to the chief operator of the Dane County Telephone Company, who will give them out to parties who call up for them.

Mr. Curran. In my county, Jackson county, we have two telephone companies, about twenty-five hundred subscribers, and every morning about ten o'clock the forecast is telephoned to one of the central stations, and sent out to many places. We get ours from Milwaukee.

Mr. Bartlett. I can say in regard to that that we are very glad to send out forecasts in that way whenever we can reach the central office of a telephone company. If there are any parts of the state not now reached that can be reached in that way, we shall be very glad to do so. This method of distribution of forecasts has been developed a great deal; at the present time there are about one hundred and fifty thousand farmers receiving telephone forecasts each day.

TOPICS OF INTEREST OBSERVED AT ST. LOUIS WORLD'S FAIR.

A. L. STONE, MADISON, DANE COUNTY.

In taking up this subject it has been a question as to where to begin, whether at the commencement of the trip to St. Louis, or to take up only the St. Louis part of it.

There were some observations made on the way which were interesting to me and may be to some of you who failed to take the trip, so I have decided to mention a few of them.

In the first place, it was interesting to note the gradual change from the hilly, uneven region surrounding Madison to the low, level corn lands of Illinois and Missouri. Accompanying the change in the appearance of the surface of the country was as pronounced a change in the crops grown. The mixed grain farming, as followed near Madison, slowly gave place to a system in which one crop, corn, was predominant. When we reached Illinois and were speeding on toward Missouri, the writer's eyes were gladdened by the sight of the vast stretches of golden corn. While one may not approve of a system which is slowly but surely sapping the fertility from the soil—for a large share of the corn is sold either to cattle feeders or to starch and glucose factories—yet to the true farm and nature lover there is something beautiful and inspiring in these immense fields of waving corn.

We passed many fields where the corn picking had already begun and the farmers were in the fields with their double-box wagons, gathering in the golden store. Each wagon box had an addition to one side which rose several feet above the ordinary box and against which the picker threw the corn, and from where it dropped back into the box. This, of course, prevented the picker from throwing over the wagon.

It seems somewhat out of place to one who has been reared in a part of Wisconsin where corn fodder and stover are carefully preserved, to see so much of it going to waste; but each

section follows an agriculture of its own. It seems only a matter of time, however, when the fertility of even these very rich soils will be depleted. This constant cropping with no adequate returns to the soil can result in nothing else.

Another thing that attracted the attention of the writer was the poor and insignificant farm buildings on these large corn farms. Their appearance would indicate anything but a prosperous condition, and they compare very unfavorably with those in the better farming regions of Wisconsin. On the whole, I was not overmuch impressed with Illinois farming.

As we approached the Missouri boundary and the Mississippi river, the lands were very low, but there were corn fields so close to the river that in high water they must have been overflowed. When, at last, just after dark, we crossed the mighty Eads bridge over the great "Father of Waters," I was greatly interested to view the lordly stream of which we hear so much.

Though not my first glimpse of the Mississippi, it was the first time I had ever crossed it, and I assure you it impressed me greatly. Seeing the river steamers and noting the great volume of water which was smoothly but surely moving toward the Gulf of Mexico convinced me that our forefathers reckoned not unwisely when they deemed the possession of this mighty stream an important factor in the future development of our country. I imagine it would stagger us could we know the immense amount of traffic which has moved over its placid bosom in the 128 years of our national existence.

It was dark when we entered St. Louis, and as our train wound around the curves and among the myriads of vari-colored lights that gleamed from every side and were reflected from the shining steel over which our train seemed to glide, one could but stand aghast at the marvels that man's ingenuity had wrought. Finally, after many stops and waits, our train was backed into the station, and we were pouring out and away under the mighty steel arches which supported the outer station roof. This union station at St. Louis is said to be among the very largest and finest in the United States, and we could easily believe it as we wended our way through it and observed the many conveniences furnished for the passengers.

There was a constant stream of people passing through, to and from the trains which were continually arriving and departing. We reached St. Louis at 8:20 on Monday evening and at once boarded a car for the central Y. M. C. A. House, where we stayed while in St. Louis. This fine building is situated almost in the heart of the city and is fitted with all the modern conveniences such as our Madison Y. M. C. A. hopes to have in a short time, viz.: Gymnasium, baths, offices, dormitories, etc.

You will notice that I am writing in the plural. Perhaps, I should have said before that Mr. Fuller, the instructor in the Animal Husbandry Department, and four of the Long Course men were on the same train and stopped at the same place.

We were so late in getting to our stopping place that we did not attempt to go to the fair grounds that evening, but went to bed early so as to get well rested before the next day's hard work, for sight-seeing is hard work, as any of you who have done much of it will be free to acknowledge.

The next morning, bright and early, we took a car for the grounds, which were some four miles from our stopping place. I might say, before going any farther, that St. Louis is a city of 700,000 inhabitants, and the fourth largest city in the United States. The street car service was excellent, much better than at Chicago in 1893.

We arrived at the grounds shortly after the gates had opened and proceeded directly to the Congress Hall, where my friends were to take part in student demonstrations, and where part of my work was to be done.

Here we found Dean Shepard of the North Dakota Agricultural College, who had charge of the demonstration work the week we were there. That forenoon we listened to a talk on judging and grading wheat in which the students were told how to detect foul seeds, bin-burned and musty grains, and grain that was infected with smut. We were also told something about the various varieties of hard and soft wheats and of spring and winter wheats.

In the same building I found Professor Hays of the Minnesota Agricultural College. He and his assistants were there

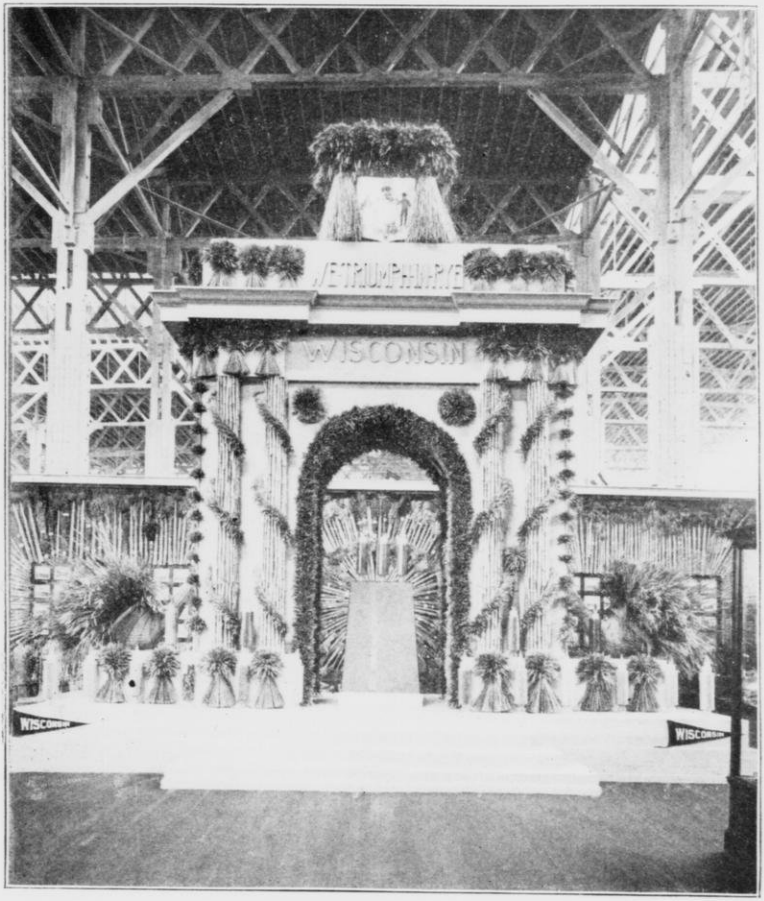
prepared to show the students and visitors how the process of breeding up grains and forage plants was conducted, and to demonstrate the means used to determine the best varieties of grain, as shown by milling and baking tests.

The arrangement of the breeding plots in the plant nursery was shown and the manner of planting the grains. Then the process of selection, where five plants out of one hundred were chosen as best, and seed saved from them to continue the breeding another year. This process of selection is carried on year after year until the grain is improved sufficiently for distribution. But physical appearance is not all that decides whether or not a grain shall be selected. The threshing and fanning mills were there, and also a bolting mill, where the grain was made into flour. Then there was the oven where sample loaves of bread from each variety of wheat were baked. Some varieties of wheat were found to make better bread than others, as well as to have a better physical appearance.

These were the grains selected for further experiment or for raising in quantities which would allow of their distribution to the farmers of the state. But I need not dwell longer on this, as practically the same process is followed by the Agronomy Department at this Station, and is described in the last annual report of the Station.

While we have not as yet made any baking tests of wheat flour, we have carried on the breeding work and will soon have several varieties of grain which we hope will go a long ways toward increasing the yield and improving the quality of Wisconsin grains. When the time is ripe for the distribution of these grains, rest assured this Association will bear an important part in the work. The Wisconsin No. 4 oats and the Manshury barley are good examples of this breeding.

It was in this same building that I heard Professor Bolley of North Dakota give a talk on disease resistant plants. He claimed—and had plants with him to attest the fact—that plants could be bred to resist rust and smut. He had samples of wheat, flax, barley, and oats which were claimed to be rust resistant.



WISCONSIN'S GRAINS AND FORAGE PLANTS EXHIBITED AT THE WORLD'S COLUMBIAN EXPOSITION, ST. LOUIS, 1904.

He said that the way to breed grains to be rust resistant was not to grow them far removed from rust and where they were never exposed to disease, but to select plants which showed little or no sign of rust, even when grown under the very worst conditions. This was the system he had followed.

When he first began, there were but a very few plants on a large plot that did not succumb to rust. The rust spores had been scattered on the ground and seed taken from grain that had been very rusty the year before, so you see the environment was about as bad as it possibly could be. The few plants which stood up and produced seed despite the rust were carefully harvested. The seed of these few plants was sown the second year, under the worst conditions obtainable, and any plants that survived were again carefully saved. Professor Bolley has continued this process until now he has varieties of flax, wheat, and barley that are practically rust resistant. If this can be carried out on a large scale, and I see no reason why it can not, the importance of it can hardly be over-estimated. Many were the complaints throughout our own state this last year concerning the ravages of rust. Smut we have largely under control, and if we can now be relieved of rust, many millions of dollars will be saved to the state every year.

I also listened to a talk by Professor Zavitz of Guelph College, Ontario, on plant breeding in Canada. He gave some interesting figures and instances.

In their grain testing he said that the Siberian oat had proven the best of something like a hundred varieties through several years' test. This oat had a wide distribution, as they have an association similar to ours, to aid in the distribution, and gave an average yield of 80 bushels per acre. The Banner oat was next to the Siberian the best yielder with them. They had tried the No. 4 oat, thus demonstrating that an oat that will do well in Wisconsin may not do well in Canada.

When questioned by Professor Hays as to the value of grain breeding, he said that he believed it was easily possible to increase the yield of oats at least 15 per cent by a careful and systematic selection and breeding of the grain. He estimated

Canada's oat crop at 2½ million acres and valued it at $12 per acre, making the crop worth 25 millions of dollars. Could this be increased 15% by breeding there would be a gain to the farmers of 3¾ millions of dollars, annually, no small item. There is no reason why the same result can not be obtained in Wisconsin. It should be as easy for us to increase the yield and quality of our grains and forage plants as for any other state, or for our neighbors on the north.

The United States Department of Agriculture estimates the oat crop of Wisconsin for the year 1904 to be 86,730,000 bushels. Could this be increased 15 per cent, it would increase the income of the farmers of the state 35 million dollars.

Nor need we stop with oats. The same thing could be done with other grains. Think what an enormous sum would be added to the aggregate wealth of the farmers of the United States were this same process followed with all our grains and forage plants. Surely the field is wide and our Association must bear an important part in its proper cultivation and tillage.

The first three days of my stay at the fair I spent largely in the Agricultural building. This was a monstrous building, covering some 20 acres and having several miles of aisles. I went through it aisle by aisle and thought I covered it pretty thoroughly. To begin to name a thousandth part of what was contained in the building would need more time and space than I have at my command. I shall therefore tell only of those things that seemed to me especially interesting.

The displays of grain from different states were simply marvelous. I thought I had some knowledge of grain production, but I found I knew very little concerning the vast resources of some of our sister states.

As might be expected, Illinois made her principal exhibit in corn. She stands pre-eminent in the quality of corn raised. There had been conducted last year a boy's contest, in which 8,000 boys took part. Two varieties of corn were used in the test, viz: Boone County White, which originated in Boone County, Indiana, some years ago, and Reid's yellow dent, which has been bred pure for fifty years. The results of competi-

tion, which is in itself an impetus to intelligent breeding, were very apparent.

There were two great pyramids of corn samples which had been raised by these boys and the surprising result of concerted effort could be plainly seen in the trueness to type and uniformity of the thousands of samples.

The Corn Breeders' Associations of Illinois have also aided greatly in this work and many of these boys were undoubtedly sons of the men who were members of the Associations. They are learning early the value of a rigid selection of seed grains and if the present rate of improvement continues, Illinois will soon lead the United States in grain and forage production. This is a lesson we need to learn, and to learn thoroughly, that there is a mighty power in concerted action along any line of effort.

While from its situation, Wisconsin may never hope to equal Illinois, Iowa, Indiana, and Missouri, in corn production, there is no reason why we should not obtain the same uniformity of product. We have no pure bred or standard corn in Wisconsin today and it is time we had. As soon as Professor Moore, with the Association's aid, decides what are the best varieties for Wisconsin, or establishes new varieties especially for our state, this Association must see to it that our corn is kept pure and of as great uniformity as that of any other state in the Union.

This uniformity is only a result of co-operation in which the interest of each grower should influence him to strongly exert himself in the matter, for a better quality of grain commands better prices.

Nor is corn the only crop in which improvement can be made. The lack of co-operation on the part of farmers with any other grain than corn was plainly evidenced by the lack of uniformity in the small grain exhibits of the various states. There is a great work to be done along this line in which our Association may well, and undoubtedly will, be a pioneer. Why can we not do the same thing with oats that Illinois has done with corn?

In the exhibits of corn, Illinois, Iowa, Indiana, Kansas, Nebraska, Tennessee and Missouri were pre-eminent, that of the latter being especially large and noteworthy, although in uniformity it was not equal to Illinois. The arrangement was especially fine, corn in the shape of ears, sections of ears and kernels being worked into the decorations in the forms of fringes, curtains, pictures, etc.

It may be interesting to know that in 1902 Missouri ranked first in corn production.

We often hear the statement that yellow corn is more nourishing than white, but this is an erroneous idea. In fact, in the southern states, where corn is used so largely as an article of food, the white corn predominates and there was as much red and calico corn in the exhibits as there was of yellow.

To the one uninitiated to the great importance of the crop, the corn exhibits must have been a mighty revelation. Corn is indeed king in America. The total exhibit covered three blocks of the building and included corn and all its by-products, mattresses, canned corn, whiskey, cob pipes, glucose, starch, oil, corn meal, syrup and corn rubber. Not only is the corn itself of vast importance but its by-products are numerous and valuable.

The absence of any corn in the Wisconsin exhibit was particularly noticeable and convinced me that our Association has a great task before it to place Wisconsin where she properly belongs as a corn growing state. Should there be another exhibition ten years hence, we hope to make a better showing of Wisconsin's resources in corn production.

But if Wisconsin did not make a great exhibit in corn, it did make a good exhibit in grains and forage plants. While the showing was not large in comparison with some others, it made up in quality what it lacked in quantity, as was shown by the medals and prizes awarded.

The exhibit of small grains and forage plants shown by Oregon was exceptionally fine and very extensive, but this shows the danger of judging a state's resources by comparative exhibits at an exposition of this kind. All of Oregon's fine display con-

sisted of grains which had been raised on irrigated soils, which form only a small portion of the whole state. There are larger portions of the state which will never be available as agricultural territory. But in the irrigated districts they raise fine grains and forage plants. Alfalfa grows four feet tall and yields in exceptional cases 20 tons per acre in four cuttings.

Oats and wheat grow six feet tall. Wheat yields 40 bushels to the acre on fields of 2,000 acres. Barley, presumably Manshury, yielded 75 bushels per acre on 150-acre fields. This is a good demonstration of the producing power of virgin soil where the proper amount of water can be furnished.

The exhibits of the other grain producing states, like Minnesota, Kansas, Nebraska, Ohio, etc., while large and interesting, were so similar as to merit no especial attention.

Of the distinctly southern states, Georgia, Alabama and Texas made good exhibits of cotton, sugar cane, tobacco, sweet potatoes, and peanuts, and Florida had a good exhibit of rice.

The cotton crop also showed itself as of great importance and also occupied three blocks. Everything was there from the plants in bloom to the finished cloth as it came from the looms which themselves were shown in operation. Methods of growing, harvesting and baling were shown and all the by-products.

Kentucky exhibited hemp 15 feet tall, corn equal to Wisconsin's, millet, sorghum, clover, especially crimson clover, very fine wheat, tobacco, blue grass, and other grasses galore. Their oats, however, were very poor. The tobacco from different states was grouped together and covered 20,000 square feet of floor space. The exhibit was a fine and very extensive one, the main feature being a vessel of the olden style surmounting a great globe. This vessel was builded entirely of tobacco and bore the date 1585 when tobacco was first introduced into the Old World.

California in the west, showed a very fine and extensive exhibit of fruits of all kinds, dried, canned and fresh, as well as splendid exhibits of grains.

North, South, East and West were represented, and the enormous producing capacity of the United States in agricultural

lines must have astonished some of our European neighbors, who have the idea that they can go from New York to San Francisco and back between two nights.

I have thus far mentioned only the exhibits from the United States. But the United States made not the only creditable display along agricultural lines. Japan had an extensive and very fine display of agricultural products. She showed rice on the stalk, in the husk and in market condition. Teas were fragrant and numerous, and there were beautiful exhibits of silks. Altogether Japan made a showing of which she might be proud, even if she had no war to prosecute. As I may not refer to Japan again, I wish to say here that she was splendidly represented in every department, agriculture, manufacturing, mining, lumbering, and fine arts. The amazing versatility of this island people fairly confounded one. Surely Japan is teaching the Christian nations a great lesson.

From New Zealand and Australia came exhibits of grain and wool that were remarkable. Some of the finest and heaviest grains I ever saw were in the New Zealand exhibit. I tried to beg a few grains of each variety, but the man in charge would allow none of it to go, saying it was to be presented to the experiment stations of the different states. I told him to be sure and remember the Wisconsin Station, but I fear he failed to do so, for we have as yet received none of the grain.

Canada furnished a fine exhibit of grains and forage plants. Her exhibit of wheat was especially noteworthy. There can be no question about the existence of fine agricultural territory in Canada. Why should there not be? Canada is only a misguided portion of the United States. We hope she will some day see clearly that her best interests lie in union with the United States.

In this building was also exhibited the larger part of the agricultural machinery. All the makes of binders, grain and corn, were shown. There were combined corn harvesters and shockers, but these did not seem to me to be practicable. The shock was built and tied on the machine, but the machine had to stop and the shock be lifted by a rope and pulley before it could

be swung off the machine. There were all kinds of corn planters, listers, and cultivators, plows, hay presses, threshing machines, and in fact all kinds of farm machinery, none of which was especially noteworthy.

I have confined this paper largely to grains, because that is what we are especially interested in at present. You may, however, be interested somewhat in other things. I have not mentioned live stock particularly because I did not see much of it.

The cattle and horses had been removed and the hogs and sheep just brought in when I reached there, so I did not see any horses and only a few cows which were remaining to finish tests. I did go through the barns and gaze on the fine specimens of sheep and hogs, but knowing so few of the exhibitors I did not take as much interest as I would otherwise have done. I saw the prize-winning sheep of which our Superintendent of Farmers' Institutes, Mr. McKerrow, is so justly proud and which carried off $4,800 in premiums and awards.

I also saw Loretta D, the prize Jersey, and her competitor. Otherwise my time was occupied so fully elsewhere that I learned little about the prize winning live stock.

Before I leave agriculture entirely, I wish to mention the agricultural map of the United States which covered five acres and that was a part of the exhibit of the United States Department of Agriculture. In this exhibit a plat of ground was laid out to resemble the United States and each state was outlined in its natural form by the use of gravel walks and the United States boundaries and coast lines were formed of the same material. Then the territory included within the borders of any state was sown and planted to its natural grasses, grains and forage plants, the plants changing with the season's advancement. Although many of the crops were matured when the writer was there, this exhibit was still very interesting, cotton, sweet potatoes, peanuts, etc., were still green in some of the southern states.

But to pass on. Just west of the Agricultural Building was located what was called the floral clock. This was a monstrous

affair, the dial of which was composed of different colored foliage plants. The hands were 50 feet long and very heavy, the minute hand weighing 1,800 pounds. The clock itself was housed in a glass case. On the right side of the above-mentioned clock case was another smaller case in which was a large hour glass in which the sand ran steadily back and forth. On the left of the clock case was a big bell weighing 5,000 pounds which tolled at the half hours and hours in a tone that could be heard in nearly all parts of the grounds unless the din were too great. It could be heard at a distance of 2 miles.

A short distance to the right was the pool where the United States life saving station gave exhibitions of life saving every day at 2:30 o'clock. The work was very realistic and showed the progress that has been made in this, as in other things.

Up on a hill a short distance away was the receiving tower of the De Forrest wireless telegraphy, which the inventor claims to be superior to the Marconi system.

The Philippine village was a very interesting sight, with the natives eating dog meat and living in their bamboo huts. While gazing at them I was convinced that our democratic friends were unwise in urging independence for the Filipino at this time. And yet when I entered the United States Government Philippine exhibit I was amazed at the size and excellence of the showing made. Surely the time will come when people who have shown the ingenuity and intelligence that the Filipinos have will be fit for self-government.

There were educational exhibits that our American schools could not excel. There were beautiful cloths and fabrics that made one long to possess the wealth of a Croesus. There was a display of fire arms from the primitive bow and machete to the modern gun and rifle.

There was as beautiful a collection of useful woods as it was ever my good fortune to witness and the polish some of them were capable of sustaining was dazzling.

There were table tops ten feet in diameter, sawn from a single log and polished to a degree of which but few of our native woods are susceptible.

WISCONSIN FRUIT EXHIBIT AT WORLD'S FAIR, ST. LOUIS, OCT., 1904.

Then there were coffees and teas and medicinal herbs, barks and roots of various kinds and in large quantities; also animals, birds, etc. Surely these islands are well worth possessing and I believe the time will come when the United States Government will receive back many fold everything the islands may cost her.

I cannot close this paper without telling you something of the horticultural display. The exhibits of fruit were extensive and very fine and included the full representation, from Minnesota and Wisconsin on the north, to Florida on the south, and from Maine in the east, to California, Washington and Oregon in the west.

The showing of fruits from the Northern states, such as New York and Wisconsin, were much alike. Of the Southern states, Florida showed bananas, lemons, oranges and persimmons, as well as cocoanuts.

California's exhibit was fine and very extensive, both of canned and fresh fruits.

Missouri had a fine fruit exhibit and was the only state, I believe, which excelled Wisconsin in its fruit display. Of course the Missourians had the advantage of being close to their supplies and could furnish larger quantities and keep them fresher possibly, than could Wisconsin. That Wisconsin carried off as many prizes as she did is a source of much congratulation and the State Horticultural Society deserves a great deal of credit for the excellent exhibit furnished and maintained.

I have confined the topics discussed in this paper almost wholly to agriculture. To attempt to tell of much outside would take up, I fear, the whole of our next annual report.

There were great and interesting exhibits in the Halls of Education, Machinery, Electricity, Liberal and Fine Arts, Manufactures, etc., which it would not be wise to attempt to describe in a paper of this kind.

While the Exposition was scattered over a little too large a tract to allow one to make the most of his time in sightseeing, it was a magnificent show and well worth visiting. The grounds occupied 1,240 acres of land, 250 acres of which were under

cover. Even if one has seen such a fair as the one at Chicago in 1893, there would be a great deal to interest him here, as the world of invention and progress has produced many new and interesting objects.

All in all, one could but feel greatly repaid in every way for a trip to this greatest of all expositions.

SEPARATING OATS FROM BARLEY.

RUFUS GILLETTE, VERONA, DANE COUNTY.

My seed barley of the crop of 1904 had a sprinkling of oats in it and I have been looking for some effective method of separating them from the barley. Professor Moore suggested that oats could be separated from barley by using water as a separating medium. I have made a few trials of this method and think it is a very easy and efficient method, as well as a fast one, if gone at systematically.

While treating my barley for smut I used two kegs that held about ten gallons apiece and filled them about two-thirds full of solution, and then poured the barley in slowly, allowing the light barley and oats to rise to the top and the heavy barley to sink to the bottom. I then skimmed off the grain that had risen to the surface of the solution, drained out the solution after a sufficient length of time to kill all smut germs, and then emptied out the heavy barley.

This method, as I operated it, is somewhat slow, but I found it very efficient, and it can be improved, and I believe, with an especially constructed apparatus, could be made very thorough and done very quickly. I treated enough by this method to sow four acres and have sown as much untreated for the same amount of ground, and will know more of the efficiency of the method at threshing time.

This method can be used to separate any light grains from heavy grains. I think it could also be used to advantage in im-

proving any variety of grain that will settle in water, as there are some light kernels in all grains that will grow, but will not produce a good stalk, or stool out as much as plumper grain that has more vitality.

I expect to have a plan for a faster method of treatment in our next report.

SHOULD AGRICULTURE BE ADDED TO THE CURRICULUM OF STUDIES IN THE PUBLIC SCHOOLS.

STATE SUPT. OF PUBLIC INSTRUCTION C. P. CARY.

Members of the Association: I appreciate the honor of being called upon to speak to you this afternoon for a little while in regard to matters that pertain to our schools. I have been sitting here listening to your addresses and noticing in the program the things that you are discussing here these two or three days. It makes my imagination very active. When I think of the conditions that existed in the state of Wisconsin less than fifteen years ago, it does seem to me that the opportunities are opening up for young men—for all people—in Wisconsin almost beyond the power of imagination to conceive. When we think what we are doing in agriculture, that is, in the raising of crops and in the feeding of live stock, it tempts a professional man to get back on the farm. I want to congratulate this Association upon the work that it is undertaking.

I want to direct your attention for just a little while this afternoon along certain lines which are a little different from the lines which you have been pursuing in your discussions thus far.

We have been in this State of ours for a number of years endeavoring to get the school teachers and pupils interested in the study of the environment, in the study of things that lie immediately about them. My notion of the matter is that there are too many weaknesses in our schools so far as the

instruction is concerned. I might say, though, before I speak of these weaknesses, that it is a fact that a surprisingly large number of the men and women who have done things worth doing and who are doing things today, are men and women who have grown up on the farm. It seems to develop in a man who grows up on a farm, the ability and power to actually amount to something in the world. A larger percentage it seems to me of the young men who have had a farm training and a common school education, become men of note and power, than we have any reason to expect at first thought.

As I said a moment ago, I think there are some vital defects in the teaching of our rural schools and it is about them that I intend to speak. In the first place, these schools, as a rule, do not develop that power in the common branches, as we ordinarily call them, that they ought to develop. It too often happens that a boy or girl from the country school is unable to solve an arithmetical problem with skill and ease. There seems to be in the work of the country schools in arithmetic, and in writing, and in reading, and in spelling, and the other branches that we speak of as common branches, a defect in the instruction so that practical results are not obtained as they ought to be.

I want to talk of another side in which the work is defective, and that in studying the environment. A boy or girl who is really interested in the things about him or her learns a great deal. He learns a great deal by his own unassisted observation, but the boy or girl who is not naturally bright and alert learns but little from the environment. If the teachers were sufficiently alive to the surroundings to give such pupils the turn of mind necessary to make them observant, much would be gained.

It seems to me that the best teaching I ever did in my life was teaching that I did in a certain school a number of years ago, a small school, where the pupils had this country environment. It was in a small town, but a large number of the pupils came from the country, and the pupils in the village were practically in the country. Those pupils of mine learned during

the five years I was with them to know what was going on on the farms round about them; if the farmer was planting corn, they observed how deep he planted it, whether he practiced rotation of crops or not, observed how large the farm was, and a thousand other things of interest to the farmer.

Without taking time that was appreciable those children were learning lessons and observing things about them, which to my mind were of very great value to them. I know some of those boys worked on the farm in the summer time during their vacation. I heard at many times that they were of use to the farmer upon the farm in a degree beyond what the ordinary boy would be. A farmer would say to me that "I never knew how many acres there were in that lot of mine until those boys made calculations and told me." "I never had my attention called to the matter of rotation of crops until your boys talked to me about it." "They talked about hog raising, and told me how to take care of my stock in ways I did not know before."

Now, all these things were done without any detraction whatever from the ordinary lines of study. A boy came in the school one day in the spring when the robins were first appearing and said he had seen a robin. I asked the question, "Did you ever see how a robin builds his nest?" They all wanted to tell me about the nest, but I said, "Wait until you look carefully and see." They began to watch as they went to and from the school. Finally from observation they could tell me all about the nest and the manner of building. Many questions would turn up in connection with the recitation which could be answered only by observation outside the school. The boys went out and measured corn cribs to see how many bushels of corn they held. They measured piles of wood, etc. They would estimate distances, how far it was from the corn crib to the house, how far it was from house to house, or tree to tree, and by practicing that sort of thing they became wonderfully expert in measuring distances and doing a thousand and one things that a person on the farm is called on to do almost every day.

If we could have these things go on in connection with our

school work, how greatly it would improve the quality of the work and add interest to that which ordinarily is but slightly interesting, because it is dull and of a routine sort.

My pupils, not working on the farm, came to the school during summer, and kept gardens, raised vegetables, and we had our lessons on nature, and every Saturday morning we would talk and chat about what was going on in the home, and then went about our business for another week.

Whether you are members of the school board, or are simply interested in schools, you should use your best endeavors, in the various communities, to get your schools turned into these two lines I have spoken of. Many schools are simply grinding away trying to memorize a few facts out of text books and I can assure you that the memorizing of these facts in the text book is often very blindly done. Now, you know very well that what we simply take into our memories and do not digest is of little value. It cannot stay with us long, unless it is in relation with some practical thing we have to do. I fear in our schools there is a great effort made to remember merely what the book says.

EXTRACTS FROM SUPERINTENDENT'S BIENNIAL REPORT ON TEACHING ELEMENTS OF AGRICULTURE.

INSTRUCTION IN THE PRINCIPLES OF AGRICULTURE.

Instruction in agriculture has, for the biennial period just closed, received much attention in the Teachers' Institutes. On the first of January, 1902, a law went into effect requiring all applicants for certificates to teach in country schools, to pass an examination in the elements of agriculture. Reports go to show that, generally speaking, the teachers have met this requirement surprisingly well. Except for the fact that every year finds a large percentage of raw recruits in the teaching ranks, it would be comparatively easy to train teachers to do effective work in

this interesting and valuable branch of instruction. The difficulty here met, however, unfortunately does not apply to the teaching of agriculture only but to all other subjects in the curriculum as well. The admitted lack of qualified teachers was the occasion at the meeting of county superintendents in January, 1903, of a quite general expression to the effect that it would be unwise to require at that time formal instruction in agriculture. The same objection, in a measure, holds good today, but it is the opinion of the State Superintendent that the time is quite as ripe now for making the elements of agriculture a required study in the country schools, as it will be for many years to come. It is therefore to be hoped that we may soon have some legislation which shall place this subject on an equality with English grammar and United States history and other common school branches in the common school course of study. Nothing will tend more to prevent the ill-advised rush of country boys to the city than to convince them that farming may be made scientific, and that in no occupation does the application of brains pay better or surer dividend. With the introduction of rural free delivery of mail, the extension of trolley lines, railroads, and telephone lines, farm life is developing more attractiveness year by year. Along with this should go the constant development of the intellectual side of farm life, both for the welfare of the country, and the happiness and content of the rural population, which in a large measure constitutes the backbone of the state.

Not only should there be instruction in agriculture for the advanced pupils but there should be in the school from time to time general exercises which have for their purpose the stimulation of interest of all the pupils in the natural phenomena falling under their daily observation. The common school course of study has in the past been very weak on the science side. The effort has been to get pupils to study books. This is well so far as it goes, and it is much to be desired that even greater success in the future may be secured in this direction, but such study is not the whole of education. There is great need in the training of all young people, of instruction in the laws of nature

through observation, experiment and interpretation. To give young people a bent of mind which will start them on the search for causes when effects are observed, is to give them a bent of mind that will make them students for life. The great need of the city schools is the laboratory of nature which the country school has for its natural environment.

It seems to me that it might be well, if your judgment is the same as mine in the matter of introducing agriculture in the common schools, for you to lend your aid as far as you can with the legislature in bringing this about. I know there are differences in opinion in regard to it, and I cannot say what your opinion will be, but I am disposed to think you will favor it.

Some think the teachers are so poorly equipped for that work, that it would be inadvisable to have them attempt to teach agriculture. It seems to me that with the effort we have made for a number of years to get persons prepared to teach agriculture in the rural schools, by requiring for the past three years examinations in the subject, by work in the institutes, and the work being done in the seven counties of the state in the county training schools, where agriculture is one of the branches of study, and the two agricultural schools that are at work in two of the counties, that the time is really ripe for a move in these lines that I have suggested. Now it may be that the work in the schools would have to be pretty largely book work for some time, but it is of sufficient value to make it worth while for a boy, or girl either for that matter, to take up an elementary book of agriculture and read what is therein written and comprehend it. I believe that this subject should be required by law in our schools in this state.

SPECIAL CROPS.

T. S. BIGGAR, WALKERSVILLE, CANADA.

We are living in an age of specialties. Men who wish to succeed in life as doctors specialize in human anatomy, medicine, etc. Lawyers specialize in law. So it is all along the line. A man to obtain the greatest success must specialize. This being so it is necessary for us as agriculturists to specialize with our crops as well as our stock. In going about from place to place one sees a number of crops that are special in the locality in which they are grown.

With a view of increasing the income of our farm I visited Fennville, Michigan, to investigate peppermint growing, which to many of us is a special crop. Peppermint is put on the market in the form of an oil which is obtained by distillation.

Mint thrives best on low, rich clay loam that is fairly well drained. To start the crop, the roots are dug from old fields and placed end to end in furrows. These furrows are made three feet apart in well worked soil, as early as possible in the spring.

The first year some labor is necessary to keep the weeds down and the surface ground loose. After the first year very little is done except to manure the land. In July when the crop is ripe it is cut and hauled to the still much the same as though it were clover hay, except that it is not cured. Most every large owner has a still of his own, which can be put up for one thousand dollars. The still consists of a boiler and two tanks, also a worm for distilling the oils. The tanks will hold half a load each of the mint hay. When the tanks are filled and the cover screwed down, steam is turned into the boiler for half an hour. The steam for the tanks is run through the worm and the oil is separated by condensation. The tanks are emptied and the hay spread out to dry, being gathered up afterwards for stock feed.

It costs about fifty dollars per acre to procure the roots and cultivate the crop the first year, and about fifteen to twenty-five

dollars for the next three years, when the crop is again renewed. The yield of oil runs from twenty to sixty pounds per acre, and the price ranges from fifteen cents to four dollars per pound. The price of oil of late years has been good. Last season it was about three dollars and fifty cents per pound, the average yield being about fifty pounds per acre.

One man whom I met, grew a large field which yielded sixty pounds per acre, and sold it for three dollars and sixty cents per pound. After taking out thirty-six dollars per acre for labor, rent, and distillation, he had a net profit of one hundred eighty dollars per acre.

Many crops which we hear much of are especially good things to keep out of when one comes to look them up. Madder is one of this class. The roots used to bring a high price for use in dyeing; but the aniline dyes are so much cheaper now that this crop is a thing of the past for profit. After looking into ginseng, a crop that we hear many fancy things about, I feel that that too, is a good thing to keep out of. The people who make the money out of this crop are the ones who furnish the roots to the new and enthusiastic beginner, at high prices. Of course it is to their interest to show this crop up to the best advantage.

The thing for the Wisconsin farmer, is not to look so much for new varieties of crops, as it is to improve the many varieties already grown in the state. This improvement has got to be made if Wisconsin wishes to hold her own. It must be done if you farmers get a fair return for your time and investment.

Every time I come back to Wisconsin I become more and more convinced that the farmers have got to make a change in their methods of farming. Many farms that used to give good returns, today will hardly pay to run. This condition is not due to trusts, freight rates, prices, or any thing else, but that the fertility of the soil has been exhausted to such an extent that many of the farms will scarcely grow a good crop of white beans. Why the people will be so blind as to kill the goose that laid the golden egg, I cannot understand. It costs as much or more for the work on a poor crop, and it is in the difference between the good and the poor crop where the profit lies.

If one man in selecting his crops and seeds for the same, and scientifically farming his land, can grow better crops than those of his neighbor, they are therefore special crops and they will always pay.

Tobacco, while it need not have been so, has done more to ruin southern Wisconsin than any other one thing. Tobacco growers rake and scrape all the fertility from their farms and put in on the same small section of the farm year after year. This can have but one result, and that is, that nine-tenths of every tobacco farm is well nigh exhausted of its fertility. I believe that if every man will look at the matter from all sides, he will say with me, that if people here are going to continue to grow tobacco as they have in the past, and thus rob the rest of their land for the sake of the tobacco, it will be far better for the state if they had never grown a single plant. It is the same with sugar beets. You must not put everything into the one, but pay a goodly attention to the ninety and nine or you will have the round hundred lost.

Every man here today should go away with the determination that he will do all that is possible to help overcome this awful state of affairs that exists in the way of robbing the soil. You not only owe it to yourselves, but also to those that follow you. It is a crime to civilization to rob the soil from whence comes most all the wealth of the world.

Get your farms into shape to grow special crops, and then grow them. Again let me say, return to your homes, ordain and establish a system whereby special crops may be grown by yourselves and your posterity.

WORK OF A BOYS' EXPERIMENT CLUB.

SUPT. O. J. KERN, WINNEBAGO COUNTY, ILLINOIS.

Members of the Experiment Association, Ladies and Gentlemen: I am glad to have the honor of being with you this evening and saying a few words to you. I was glad to be here this

afternoon and hear your discussions and know something of the work of your Experiment Association. You have been growing some since I was here in 1901. As I walked over your experiment farm then, this building was not visible. Surely you have grown, and I congratulate you. I notice in the paper that you have five hundred and twenty-nine students in the College. Again, I congratulate you.

We have been growing a little also in Illinois. There was a time when if we wanted a boy to make better butter or make cheese, or learn to be a better farmer, we had to send him out of the state to Madison, Wisconsin. We do not have to say that any more.

We have a one hundred thousand dollar agricultural building, with a state appropriation of one hundred and fifty thousand dollars a year for the Experiment Station, and with our new eighty-thousand dollar building for the farmer girl, we do not have to go out of Illinois to learn how to be better farmers and housekeepers, and so you can congratulate us. Not very many years ago the Illinois farmer boy thought that an agricultural education was not the true kind of education and so would not attend any agricultural college, but, now we have nearly four hundred students in the Illinois College of Agriculture and we congratulate ourselves. There is another side to look at. There are only four hundred boys learning to become better farmers at the college so let us think of the thousands and thousands of young men on the farms in Illinois who do not know much about the Agricultural College and Experiment Station. I know some farmers say what is the use of putting a five thousand dollar education on a fifty cent boy, but I fear many farmers are putting a fifty cent education on a five thousand dollar boy. I am pleading for the country child. The country boy should receive what President Roosevelt would call "a square deal" as far as educational opportunities are concerned.

I spent nearly two months at the St. Louis Fair in 1904 trying to learn something about two things. First: What is being done in the United States with reference to higher education for the American farmer, and those of you who were at the

Palace of Education and saw the exhibits of the United States Experiment Station and various State Experiment Stations may have a faint idea of what is being done in the way of higher education for the American farmer. Ten million dollars is expended for the higher education of the American farmer. I tried to find out a second thing, viz., what is being done in the United States in the way of better elementary education for the farmers' boys and girls, what is being done to improve the country schools all over the United States? Ninety per cent of the country children get their own education as far as books are concerned in the country schools. I walked over to the Palace of Agriculture and I think over the nine miles of aisles and saw the products from the farm. To me the most significant thing was a little collection down in the corner of the Illinois exhibit that I do not suppose one person out of every five thousand ever stopped to look at, and that was the result of seven years of breeding and developing high bred corn at the Illinois Experiment Station. If every farmer in the United States could raise one bushel more per acre it would mean an increase of twenty-five million dollars, annually. Doctor Hopkins down at Champaign and also the Corn Breeders' Association of Illinois are demonstrating that this can be done and that one bushel to five bushels more to the acre of high bred corn of higher per cent of protein and more oil can be produced. What is being done over the United States to improve the country schools? In my county I have one hundred and six one-room country schools and in these one hundred and six country schools there are fifty-three of them that have fifteen or fewer pupils enrolled, with classes ranging from nineteen to thirty daily, and many classes having only one pupil each. I am getting reports from these schools to find out how many boys are in the school over fourteen years of age. Is it necessary or desirable for our boys to go to the city to be educated?

I sympathize with the country boy for I was a country boy myself in the corn belt of Illinois, where we seem to have almost inexhaustible soil. People are changing their minds about that now and our state legislature made an appropriation of twenty-five thousand dollars for a soil survey of Illinois.

To bring the boys, and through the boys, the fathers in touch with developments in agriculture, I organized what is known as the "Boys' Experiment Club." The club was organized February 22, 1902, nearly three years ago. On February 21st, 22d, and 23rd, 1902, the Illinois Farmers' Institute round-up was held at Rockford and I thought there should be some way to get the boys of the county to thinking along the line of better education and scientific possibilities of the new agriculture. Many do not believe in agricultural colleges and if we could get hold of those people through their boys, we could change their attitude towards agriculture. I think you all agree with me that there is a new agriculture and so I want to get our boys in touch with it. I thought at this Institute if there is a way that we could get the boys together and work for a common purpose, it would mean much for their future work.

I had the boys meet me in my office, February 22, 1902, and thirty-seven boys and a few fathers were present. Since then the membership has increased from thirty to four hundred and fifty boys who range from nine to twenty years of age. I talk to the teachers and farmers, write articles for newspapers, and thus arouse a greater interest. We have not reached that stage where we have a constitution and by-laws. I have the names and addresses of all the boys in my office and send a duplicate list to the Illinois Agricultural College and Experiment Station. Bulletins and reports of the Experiment Station, and the different literature that I have goes to those boys, and so we have four hundred and fifty boys, who are being interested in the new agriculture.

During the season of 1902 we did experimental work in the way of sugar beets. The Illinois legislature appropriated several thousand dollars to carry on experiments to see whether sugar beets could be grown in Illinois with success or not. Several boys grew good beets in 1902. They made their own observations, kept account of what they raised and what they fed to the stock.

This work puts the boys in touch with the Agricultural College, and gives them higher ideals of the farm.

Now, I want to read you just one boy's report on his sugar beets, to show you his method.

REPORT OF A MEMBER OF THE EXPERIMENT CLUB WITH REFERENCE TO SUGAR BEETS.

"My plot of ground was twenty-eight feet wide and twenty rods long, making forty-five square rods of land. There were twenty-six rows of beets planted seventeen and one-half inches apart. The total expense of raising them was as follows:

April 23, plowing	$ 40
April 24, twice harrowing	25
May 10, cultivated with seeder	25
May 10, harrowing	25
May 27, disking	15
May 27, harrowing	25
May 27, twice planking, planker weighed 600 lbs.	25
May 27, planting, three hours, at 15 cents per hour	45
June 4, hoeing and straightening plants, 4 hrs. at 15 cents	60
June 10, raking, three hours, at 15 cents per hour	45
June 28, hoeing with wheel hoe	50
July 7, thinning out, 20 hours at 15 cents	3 00
July 9, hoeing by hand, 12 hours at 15 cents	1 80
July 19, hoeing with wheel hoe, three hours at 15 cents	45
July 28, hoeing with wheel hoe, three hours at 15 cents	45
August 9, hoeing with wheel hoe, three hours at 15 cents	45
Sept. 13, weeding, three hours at 15 cents	45
Nov. 10, harvesting, forty hours, 15 cents	6 00
Nov. 10, team work	1 50
Rent of land at $5.00 per acre	1 50
Total cost planting, cultivating and harvesting	$19 75

The yield of the plot was 12,500 pounds, deducting 1,500 pounds for dirt, leaves 11,000 pounds of beets. Number of tons, 5½; number of bushels (60 pounds), 185. Actual cost of production per ton was $3.58; cost per bushel, 10 cents. Chemical analysis showed 18 per cent sugar, with a purity coefficient of 86.7 per cent."

REPORT OF EDOM BLACK OF WINNEBAGO COUNTY, ILLINOIS, EXPERIMENT CLUB.

Our work for the last two years has been experimenting with high bred corn. I do not want to go into detail here to tell you members of this association about the breeding and development of corn in Illinois. Suffice it to say that the State Farmers' Institute of Illinois in order to encourage our boys gave each boy 500 grains of high bred corn, if he would write for it and send four cents in stamps to pay postage.

There had been selected a high bred leaming corn that was grown by the Corn Breeders' Association in Galesburg. Climatic conditions were favorable and the corn matured fairly well. Each boy was requested to keep records, note preparation of the seed bed, tasseling, select ten ears of the best, and make an exhibit of the same for prizes offered by the Winnebago County Farmers' Institute. We had our last meeting January 10, 11, and 12, 1905. The farmers of the county raised one hundred and fifty dollars in cash for prizes. The boy who took first prize of fifteen dollars in gold was a lad twelve years old.

I urged the boys to write letters to me about their corn. Here is a typical letter from a boy for year 1903:

My corn was planted on a piece of land which was part black loam and part blue clay. The land had been used for corn the year before, but was well manured by using one load for the piece of ground the corn was planted on. It was plowed six inches deep on the 7th day of May and dragged with a two section drag until all the lumps were broken. It was marked off with a cultivator and then it was planted 2 kernels in a hill.

I planted 300 kernels in the middle square and the rest on the south and west. My corn was planted on the 9th of May. There were 2 stalks in every hill, excepting two which did not come up. There were 357 ears, and very few stalks without ears. The total weight was 352 pounds at time of gathering. I gathered it the 22d of November.

The cost of raising it was as follows:

Postage on corn seed	$ 07
Plowing of ground, one hour	20
Dragging of ground, 15 minutes	05
Marking of ground, 15 minutes	05
Planting of ground, 30 minutes	10
Hoeing, 30 minutes, May 29th	10
Hoeing, 30 minutes, June 28th	10
Plowing, 30 minutes, June 24th	05
Weeding and hoeing, July 17th	25
Hoeing, July 24th	10
	$1 07
There were five and one-half bushels at 45 cents, or	$2 48
Cost of raising	1 07
Gain	$1 41

MARVIN BATES,
Winnebago, Ill.
R. F. D. 2.

I print all the letters in my annual report, and this report goes into nearly every farm home in the county.

I thought it would be a good thing to get our boys to go on an excursion to Champaign and inspect the College and Experiment Station. Six carloads of people, boys and adults, went over to the Experiment Station in 1902 and saw alfalfa fields, and all the main things connected with the experiment work at the Station. The girls visited the Domestic Science department. Two hundred and nine went on the second excursion to Champaign in 1903, and only thirteen went the second time of the total number visiting the first year. These are all missionaries for better things with reference to the farm.

In 1904 we went over to Ames, Iowa. Two hundred and one went on this trip. Our fourth annual excursion will be June 2 and 3, to Wisconsin Experiment Station at Madison.

I do believe in the country child and we should do all we can for him, so he can have just as good an education and preparation for life's work as now given to the most favored city child attending the public school.

INFECTIOUS OR EPIZOOTIC ABORTION OF THE COW.

A. H. HARTWIG, M. D. C., WATERTOWN, JEFFERSON COUNTY.

There is scarcely a disease among dairy cows which brings about so great a loss to the owner as does epizootic abortion.

So common is this trouble in the dairy districts in this country, that the practicing veterinarian in these sections is almost daily confronted with these questions:

What can I do for my cows, they are aborting one by one, and the production of milk from my herd is rapidly decreasing? The cows do not thrive well after aborting.

Can anything be done to stop these cows from aborting, or to prevent the disease from going through my entire herd? These complaints have become quite general in dairy districts.

Epizootic abortion has been known to exist permanently on some farms and to cause for many years serious pecuniary losses. All abortions must not be considered infectious or contagious, there are cases where a number of cows in one herd may abort because of an accident, viz., well fed cows or heifers in a barn yard or pasture will often take to violently bunting each other in the abdomen, which may cause death of the foetus and abortion. Acute febrile diseases, cold, poisoning, contusions, ingestion of tainted or moldy food, and unwholesome drinks, etc., may often cause abortion of one or more members of the herd and not be in any way related to infectious abortion. The disease is eminently contagious and may be transmitted directly or by certain intermediaries.

The transmission of the disease of a cow which has aborted to its immediate neighbors is the rule, and it is much favored by the existence behind the animals, of a trench where the excrementious matters accumulate.

The causes to which the disease was formally ascribed—tainted food, bad quality of food, permanent stabling, close breeding, etc., are but predisposing conditions. By weakening

the organism they facilitate the introduction and pullutation of the infectious matter.

Epizootic abortion may establish itself in the best stables, a fact which proves that uncleanliness plays but a secondary etiological role.

At the present time it is not known whether the virus penetrates into the blood through the respiratory or intestinal tracts. Some authorities consider the cause of abortion an infectious inflammation of the serous coating of the uterus. Others claim that the specific agent multiplies between the uterine mucous membrane and the chorion, that it does not exercise any noxious influence upon the former, but that it attacks the envelopes after each new conception; it would thus produce repeated abortions, and lead to sterility by communicating to the uterine secretion an acid reaction which is fatal to the spermatozoids.

Abortion generally takes place from the third to the seventh month of gestation. Sometimes the mother suffers for a long time. She may become entirely sterile.

A cow that has aborted has the tendency to do so again the following two years, but each year this tendency diminishes, and unless new cows are introduced into a herd the disease tends to exterminate itself. Each year the abortion takes place later and the animal seems to acquire immunity in a few years.

Treatment.—The prophylaxis is very important. If once established it is impossible to prevent abortion; medical agents are of no avail.

We must first of all isolate the sick animals; it is advantageous to put the healthy cows at pasture (if grass is in the season). It is also necessary to destroy the placenta, and the dead foetus by fire or burying deeply, and thoroughly disinfect the stable in which the cows have aborted; whitewash the walls and give plenty of light and pure air in the stables. About the best agent to apply to the floor is air-slacked lime. Apply at once, daily after cleansing, covering the entire floor with a thin coat. This is not only cheap and effective, but also adds to the value of manure.

Cows that have aborted should have the placenta promptly removed and then cleansed by irrigating parts with a tepid solution of one to five thousand bichloride of mercury, using from eight to ten quarts of the solution once daily with fountain syringe, until all evidence of the disease disappears. No cow should be bred while in a suspicious condition. The solution should also be applied to external parts that may have been contaminated.

We may also increase the resistance of all the animals by means of food rich in nitrogen, and by administration of tonics.

Subcutaneous injections of a solution of carbolic acid have been experimented with, which have given variable results. Theoretically carbolic acid seems to be inefficient; in the organism it is rapidly transformed into sulpho-phenic acid which is without effect. Feeding carbolic acid and other drugs has also proven inefficient.

The above mentioned carbolic acid treatment has been reported to be successful by some writers, but careful observation and practical experience in the dairy districts of Wisconsin have led the writer to believe that the cases so reported were such, in which the disease had either naturally exterminated itself or were not cases of epizootic, but accidental abortions, and would naturally have terminated favorably without the carbolic acid or other treatment.

If the infectious agents exist and do their mischief within the genital organs, it would appear only reasonable for us to apply our disinfecting agents directly to the seat of trouble (if we hope to effect an extermination), instead of allowing them to go through the circulation or through the process of digestion, where they may never reach the desired spot, and if so they have undergone such chemical changes as will render them powerless to combat with the enemy.

DIVISION OF FARM CROPS.

PLAN OF WORK FOR COMING YEAR.

R. A. MOORE.

Students can get outlines of experiments with farm crops at the office. They can also secure seeds by dropping a line to the Secretary at the proper time. We have seven different lines of experiments that we desire to carry out the coming year.

Experiments on Alfalfa.—Those who sowed Turkestan and common varieties of alfalfa last year will complete the test and report results the coming season, as to yield, etc. I would be pleased to test the value of inoculating the soil this year. Five hundred dollars of the money appropriated by the state will be used for purchasing alfalfa seed. We should fully realize its feeding value. There is more protein in one acre of alfalfa than in nine acres of timothy. The time has come when clover is not a reliable crop any more in the southern part of the state and we are looking about for something to take its place with more certainty. You can get full information concerning the test to be made with alfalfa on the sheets. You will also be supplied with a bulletin which will give general information concerning this forage plant. I wish all the young men present who belong to the Association would come to the office and indicate what lines of experiments they desired to carry on. When I get a list I will know how much seed to purchase. For the inoculation tests in connection with the alfalfa experiment, we will ship bacteria-laden soil to all members making the test. Several tons of this earth were saved for this especial purpose. If bacteria is not in the ground, the plants will not develop nodules.

Tests to Determine if Bacteria-Laden Nodules were Present.—The past year I made several hundred tests to see if the plants developed the nodules naturally in all parts of the state, and in practically all examinations made, the proper nodules

were found on the roots of the alfalfa plants. There may be portions of the state where the plants will not develop the nodules and it is this that we wish to determine. In some instances only a portion of the plants examined had nodules on the roots. There may be an advantage in inoculating the seed or soil so that every plant will develop nodules at the early stages of its growth.

Corn.—I have a variety of seed corn that I can give out this year to all members of the Association living in the south and southwestern parts of the state. I think this variety of corn will do well in the southern half of Wisconsin. It is known as Wisconsin No. 7, a medium early variety of white dent. I expect to grow thirty acres of it the coming season. It will be a variety that we can depend upon after it is properly acclimated.

Next year I will have an early yellow variety which I am improving. The variety which I am speaking of I think will mature readily in the central and north-central parts of the state. If this early corn proves to be what we desire we will get it out as we did the Swedish oats and make rapid strides. Corn has more money value than all other crops in the line of cereals grown in the United States. It represents in cash value 55% of the cereal crop.

Barley.—I would like to have about one hundred members grow the Manshury barley, as I think they would find it a profitable crop to grow. The Station has a barley known as the Oderbrucker, a strong, six-rowed, bearded variety, which is giving excellent returns. It equals and surpasses in many respects the Manshury. As yet it is only grown by three parties: Alexander Krueger, Watertown, J. P. Bonzelet, Eden, and the Station. I expected to give out some of the Oderbrucker barley this year, but sent nearly all we had on hand to the Wahl-Henius Institute of Fermentology, Chicago, in order to make a brewing test. Analyses made by the above Institute show the barley to contain an albumen content of 15%.

Tests with Swedish Select oats (Wisconsin No. 4) and soy beans should be continued. We have a limited amount of soy beans with soil for inoculation purposes that will be given to the members of the Association for further trials. We desire in

Alfalfa at the University farm previous to cutting fourth crop, season of 1904. Yield of alfalfa hay four cuttings, 5½ tons per acre.

particular to experiment on how to harvest soy beans to best advantage. Outlines for this experiment will be given to those who will carry on the test.

WISCONSIN AGRICULTURAL EXPERIMENT ASSOCIATION.

Experiment 1.

Trials With Alfalfa to Determine if it Can Be Grown in Wisconsin Successfully as a Forage Plant and the Relative Value of Soil-Inoculation.

The value of alfalfa as a forage plant in the west is becoming more and more apparent and the area grown, which was very small a few years ago, has gradually widened until at the present time most of the stock producing states west of the Mississippi grow it in abundance. In Wisconsin alfalfa is yet in the experimental stage and until it has been further tried at the Experiment Station and by members of the Experiment Association, it will be well for the farmers of the state to refrain from sowing it in large quantities.

Alfalfa or lucerne is a perennial plant and belongs to the clover family. If not killed by frost, water or some other element, it can be cut the second year after sowing three or four times per season for hay, for many years without re-seeding.

It should be sown in the spring on land that is well drained, with oats or barley as a nurse crop or alone if the land is not weedy, at the rate of twenty pounds of seed per acre.

Having procured good alfalfa seed, proceed as follows: Select land that never overflows and that which is well drained and had grown a cultivated crop the previous season; the richer the soil the better will be the growth of the alfalfa. Fall plowing is preferable to spring plowing, therefore, we should select a piece that has been fall plowed if possible; pre-

pare the seed bed thoroughly and sow oats and cover as usual; then sow alfalfa broadcast at the rate of twenty pounds of seed per acre and drag once. If the season is very wet and the nurse crop lodges, cut the crop for hay and give the alfalfa a better chance to grow. The alfalfa springs up readily after the nurse crop has been removed and if the season is favorable, in from thirty to forty days, it will be fit to cut and should yield from one to one and a half tons per acre. It is well to leave a fair growth as a cover crop for the winter, as like the clover, there is danger of its winter killing.

Do not pasture the first season as it injures the young plants.

By sowing the oats at the rate of one bushel per acre you will give the alafalfa a better chance to grow as the young alfalfa plants will not be crowded as they would be if the ordinary amount of oats was sown per acre. Barley sown three pecks to the acre is preferable to oats as a nurse crop.

After carefully preparing the seed bed, scatter bacteria-laden soil on a portion of the plot before sowing the seed. Mark distinctly that portion on which the soil is sown so as to determine the difference, if any, on that portion of the field where the soil is scattered and that which was not treated.

REPORT BLANK, EXPERIMENT 1.

Getting a Stand of Alfalfa and Testing the Relative Value of Soil Inoculation.

Name of experimenter .....

P. O. .....; County .....; State .....

1. Date of sowing oats or barley and alfalfa .....
2. What variety of alfalfa used? .....
3. Nature of soil? .....
4. How prepared? .....
5. When were the alfalfa plants first noticeable? .....
6. Was the grain crop left to ripen? .....
7. Did you secure a good thick stand of alfalfa? .....

Alfalfa at the University farm properly protected with hay caps while curing.

8. At what rate did you sow the alfalfa seed per acre? ....
.....
9. At what rate did you sow the oats or barley per acre? ....
.....
10. Which seems preferable sowing with or without a nurse crop? .....
11. Did you examine the roots of the plants on both sections of the field for bacteria-laden nodules? .....
12. Were any nodules found? .....
13. Were the nodules as plentiful on the roots of the plants growing on that portion of the field that was not inoculated as where the ground was scattered? .....
14. Could you detect any difference in the growth of the alfalfa? .....
15. Date of making this report? .....
16. Give in a brief way on the back of this sheet your opinion on growing alfalfa in Wisconsin, and the benefit, if any, from the inoculation of the soil.

EXPERIMENT 1. A.

Alfalfa after First Year's Seeding.

Through the encouragement of the Experiment Association many of its membership sowed from one to two acres of alfalfa last year. The Association is desirous to learn the success of those who have sown alfalfa previous to this year and will send blanks and return envelope to any who will agree to send in report.

Report on Alfalfa after First Year's Seeding.

REPORT BLANK, EXPERIMENT 1. A.

To be sent to the Secretary, by October 1, 1905.

Name of experimenter .....

Post Office .....; County .....; State .....

1. Year and season alfalfa was sown .....
2. Was the alfalfa sown with or without a nurse crop? .....
3. Variety of alfalfa seed used .....
4. Amount of seed per acre .....
5. Was crop cut for hay the year of sowing? .....
6. If so, the amount obtained per acre .....
7. Nature of the soil .....
   (Clay, muck, highland, lowland, etc.)
8. Was good stand noticeable before the fall frosts? .....
9. What per cent, if any, winter killed? ..... per cent.
10. How many cuttings did you get the year after seeding?....
11. Weight of hay from all cuttings for the season—
    (actual) ..... (estimated) .....
12. Did you experience any difficulty in curing the crop for hay? .....
13. Did you use hay caps? .....
14. Did the plants develop the proper nodules on their roots?
    ....
15. Date of making this report .....

Please give in a brief way your method of growing alfalfa and your views as to its value as a forage plant for Wisconsin.

Experiment No. 2.

Wisconsin Seed Corn.

Very little has been done in Wisconsin up to the present time in the way of breeding good seed corn or taking care of the season's crop.

We feel that by judicious selection of seed, farmers of the state can increase the yield from ten to twenty-five bushels per acre. We know that members of the Experiment Association can do much for the communities in which they reside by breeding a choice variety of corn. Due care must be exercised in planting, cultivating the soil, harvesting and curing the crop as well as rigid selection of the seed. No matter how good the

seed if planted on weedy or poor worn-out soil and not properly cared for we could not expect a good crop.

We expect to see great strides made in the improvement of corn within the next few years and may not the Wisconsin Experiment Association be the factor to bring this improvement about.

For this experiment ten ears will be used and each ear is to represent a row. Use the ear with the least number of kernels first. Plant in hills three and one-half feet apart in the row and the same distance between the rows. The corn left from the different ears after planting individual rows can be mixed with the corn shelled from the remaining 15 ears and planted in close proximity.

Plant at least forty rods from any other corn, a greater distance if convenient. Avoid having a field of corn near the west or south of the plot as the prevailing wind during the pollenizing season is from that direction and the corn is liable to cross.

REPORT BLANK, EXPERIMENT NO. 2.

Wisconsin Seed Corn—Ten Ear Test.

Name of experimenter .....

P. O. .....; County .....; State .....

1. Variety of corn planted .....
2. Where was seed secured? .....
3. Germinating test, per cent. .....
4. Date of planting .....
5. Nature of soil .....
6. Fall or spring plowed .....
7. Following what crop? .....
8. How planted? .....

.....

9. When first noticeable above ground? .....
10. Did corn germinate evenly? .....
11. Give number of times and method of cultivation? .....

.....

12. Did corn mature well? .....
13. What per cent of barren stalks were noticeable in each row? .....

To find the per cent of barren stalks in a row count the whole number of barren and fruitful stalks present, and divide the number representing barren stalks by the number representing the whole number of stalks.

14. How harvested? .....
15. Yield per acre, actual .....; estimated .....
16. Yield per acre any other variety, actual .....; estimated .....
17. Compare yield with home variety of corn if possible.
18. The yield should be determined on the shelled corn basis, two bushels of ears being considered one bushel of shelled corn.

Experiment No. 3.

Treating Potatoes with Formaldehyd Solution for the Prevention of Potato Scab.

The potato crop of Wisconsin in 1902 is estimated at 25,800,000 bushels, valued at $9,030,000. Only a portion of the yield is retained, the remainder shipped to market, for which the farmers of Wisconsin receive a sum one-third as great as the value of the dairy products of the state. The potato industry has become so important that it needs our immediate attention.

One of the evils the grower has to contend with is the potato scab which often renders the crop of potatoes unfit for market, or nearly so. The market demands a smooth, even grade of potatoes; consequently, where the potatoes have been made rough by the scab fungus they sell at a reduced price. The scab fungus attaches itself to the tuber where it makes the ugly looking scars so often found on the potato, or remains in the soil where it is able to survive varying conditions for several years.

The scab fungus on the seed potato can be killed readily by the formaldehyd treatment here recommended, and if the seed is then planted on land that has not before grown scabby potatoes or has not become contaminated with the scab fungus in any other way, the crop should be entirely free from scab.

Method of Treatment.—Put in a cask twenty gallons of water and pour in one pint of formaldehyd, and after stirring the solution, distribute in several barrels or tubs. Put in the uncut seed potatoes and submerge for two hours. If desired, the potatoes can be left in gunny sacks or bags while being treated.

After removing the potatoes from the solution they can be cut and planted as desired. In this test the experimenter will select a bushel of very scabby potatoes and treat half and retain the other half without treatment. Plant on ground that has never before grown potatoes, and note the result.

Do not let the treated seed come in contact with the untreated seed or any sack which has held untreated potatoes. The seed potatoes for the general crop should all be treated if at all scabby.

REPORT BLANK, EXPERIMENT NO. 3.

Treating Potatoes for the Prevention of Scab.

Name of experimenter .....

Post Office .....; County .....; State .....

1. How much seed treated for the experiment? .....
2. How much seed untreated for the experiment? .....
3. Date of planting .....
4. Did you notice any characteristic difference in the growth of the potato vines during the growing period? .....

   .....

   .....
5. Date of digging potatoes .....
6. Yield from the seed treated .....
7. Yield from the seed not treated .....
8. No. of scabby potatoes found from the treated seed .....
9. No. of scabby potatoes found from the untreated seed .....

Experiment No. 4.

Treating Seed Oats to Prevent Smut.

Smut affecting oats is prevalent in all parts of this and adjoining states. The great loss sustained by farmers and the rapid increase of the smut area suggests that a remedy be found to stop this loss.

The accompanying sheets will give method of treatment to prevent oat smut.

It is the desire of the Association to know the effectiveness of this treatment by many observers, and to publish determinations in the next annual report.

Where smut has been noticeable in the oats the previous year, all seed should be treated to prevent a re-occurrence.

For the following experiment it will be necessary to treat about three bushels, sufficient to sow an acre, in accordance with plan outlined in instructions.

Experiment.—1. Take three bushels, or the usual allowance for seeding one acre, that were threshed from a field that was worst affected with smut the past season, and treat as stated in directions.

If the experimenter has no oats, he probably can obtain some from a neighbor whose grain has been afflicted with oat smut.

2. Take the same quantity from the same lot of oats and do not treat.

3. Sow both quantities on adjoining plots of one acre each. Be sure to have a distinct separation from the plot sown with the oats treated and that on which the oats are not treated.

4. After the oats are fairly headed take an ordinary barrel hoop and make several counts on the plot where oats were treated and on the plot where oats were not treated. This can be done by placing a hoop over the oats and counting all the heads within the circle and then note the number affected with smut, thus getting data to determine the percentage.

Report Blank, Experiment No. 4.

Treating Seed Oats to Prevent Smut.

Name of experimenter .....
P. O. .....; County .....; State .....

1. Did you treat oats according to directions? .....
2. How much treated for the experiment? .....
   Size of plot .....
3. How much was sown on experiment that was not treated? ..
   Size of plot .....
4. Did you treat your seed that was sown for general purposes? .....
   1. Date of sowing seed not treated. .....
   2. Date when smut was first noticeable .....
   3. When were oats cut? .....
   1. Date of sowing seed treated .....
   2. Date when smut was first noticeable .....
   3. When were oats cut? .....
5. Did you make several counts after the oats were headed using the hoop in the manner suggested? .....
6. What per cent. of oats were affected with smut on plot where seed was treated to prevent smut? .....
7. What per cent. of oats were affected on plot where seed was not treated? .....
8. Per cent. saved by treatment .....

The data obtained by counting the heads within the circle of a hoop that are affected and those not affected is a fairly accurate method of arriving at the percentage of oats affected with smut.

Send in this report as soon as the experiment is completed.

Experiment No. 5.

Tests With Swedish Select Oats.

The test made during 1904 with the Swedish Select oats (Wis No. 4) was very satisfactory and shows that the oats are especially adapted for Wisconsin conditions. The desire is now to have them grown as extensively as possible by members of the Association so that the variety will be in reach of all farmers.

In order to be placed on the list of seed growers it will be necessary to comply with certain conditions:

1. All seed oats must be treated for the prevention of smut previous to sowing.
2. Must be sown on land that is free from Canada thistles, mustard or any obnoxious weeds.
3. If possible a comparison with another variety of oats should be made.
4. A report must be sent to the Secretary immediately after threshing.

Report Blank, Experiment No. 5.

Swedish Select Oats.

Name of experimenter .....

Post Office.....; County .....; State .....

1. Date of sowing .....
2. Amount of seed sown .....
3. Amount of land covered (approximately) .....
4. Nature of soil? .....
5. Fall or spring plowed? .....
6. Sown with seeder or drill? .....
7. Were heads of any other grain noticeable within the plot on which oats were sown? .....
8. Were they removed? .....
9. Did the oats stand up well? .....
10. Did you treat the seed for the prevention of smut? .....

11. Did you notice any smut? .....
12. How much? .....
13. Was the ground on which oats were sown free from Canada thistles, mustard and quack grass? .....
14. Did oats rust? .....
15. When were oats cut? .....
16. Yield per acre of Swedish Select oats .....
17. Yield per acre of any other variety of oats grown .....
18. How many of the Swedish oats on hand do you intend to sell for seed oats? .....
19. Please give a brief description of what you think of the Swedish Select oats.

Experiment No. 6.

Tests With Forage Rape.

For several years rape has been grown for soiling purposes on the Experiment Farm with that degree of success which suggests that it is worthy of a trial by Wisconsin farmers in general.

Sheep and young stock are very fond of the plant and fatten readily when pastured upon it. Care should be taken to not let sheep feed upon it while the plants are wet with dew, or when the sheep have been kept for several hours without food, as they then eat so abundantly that it often leads to serious bloating or scouring.

The Variety Used.—The Dwarf-Essex rape has been the variety used most extensively at the Experiment Farm. This variety can be purchased from any good seed house, in five or ten pound lots for about eight cents per pound, and for considerable less in large quantities.

Rape can be grown late as well as early in the year, therefore, it often serves as a good catch crop when other crops have failed, and will afford a goodly supply of green fodder when the pastures are dry and short. If possible, try four experiments with rape.

A. Sow broadcast on one acre or more which you have previously seeded to oats, and which are about one inch in height at the time of sowing the rape. Cover with slant tooth harrow or light drag which will not materially injure the oats. Let the oats ripen and when cut, the rape will come on rapidly and cover the stubble with its wide spreading leaves. It feeds to best advantage when about 18 inches in height or a little over. If hurdle fence is used and changed from time to time, the rape eaten will come on rapidly and soon be fit to pasture again.

B. Sow one acre or more which has been properly prepared with disk harrow or otherwise, to rape, using drill and putting the seed in about 30 inches apart between the rows so as to cultivate once or twice.

C. Sow one acre or more broadcast or with the drill at the time of sowing oats. The rape seed should be mixed with the oats. If the ground is not too rich the rape will not interfere with the oat crop or lessen the yield to any great extent. After harvesting oats, rape will come on rapidly and in a few weeks be of sufficient height to pasture. If sown on rich ground in a wet season the rape will interfere with the grain crop.

D. Sow one acre or more broadcast, without dragging, when oat crop is from two to four inches in height. Sow about four pounds of rape seed per acre and, if possible, before or immediately after a shower. This method is especially recommended on low rich soils.

Amount of Seed Necessary.—When sown in drills, three pounds per acre is sufficient, when broadcast, on small areas, five or six pounds should be used; when sown with oats at the time of seeding use about one pound per acre mixed with the seed oats.

By reserving ten feet square or one square rod and cutting rape when about eighteen inches or two feet in height, then weighing, the amount of green fodder per acre can be readily determined.

Rape should be cut about four inches from the ground in order to get best results for next crop.

If season is favorable you will succeed in getting three cuttings of rape from the same plot if it is sown early and alone.

Where the object is to fatten sheep for the market, a small grain ration should be fed at regular intervals.

REPORT BLANK, EXPERIMENT NO. 6. A.

EXPERIMENT NO. 6. A.

Sowing Rape Broadcast on Oat Field and Dragging Ten or Twelve Days After Seeding With Oats.

Name of experimenter .....

P. O. .....; County .....; State.....

1. Date of sowing oats .....
2. Date of sowing rape, ...
3. What variety of rape used? .....
4. Amount of seed used per acre .....
5. Nature of soil .....
6. How prepared? .....
7. What height were the oats when rape was sown? .....
8. Did dragging materially injure the oat crop from first observation?
9. When were the rape plants first noticeable? .....
10. When were the oats cut? .....
11. How did the yield of oats compare with the yield on land where no rape was seeded? .....
12. How long after oats were cut before rape was fit for feeding purposes? .....
13. How many and what kind of animals did you pasture upon the rape? .....
14. Did you feed a grain ration also? .....
15. Did animals fed upon the rape thrive? .....
16. Approximately, how much green fodder did the rape produce per acre? .....

17. Did you notice any detrimental effects from the feeding of rape? .....
18. Briefly give your opinion as to the value of rape as a soiling crop. .....

REPORT BLANK, EXPERIMENT NO. 6. B.

Sowing Rape With Drill.

Name of experimenter, ...
P. O., ...; County .....; State .....

1. Date of sowing, ...
2. What variety? .....
3. Width between rows? .....
4. Amount of seed used per acre? .....
5. Nature of soil? .....
6. How prepared? .....
7. How long after sowing was rape fit for feeding purposes? .....
8. How many and what kind of animals did you pasture upon rape? .....
9. Did you feed a grain ration also? .....
10. Did animals fed upon the rape thrive? .....
11. Approximately, how much green fodder did the rape produce per acre? .....
12. Did you notice any detrimental effects from the feeding of rape? .....
13. Briefly give your opinion as to the value of rape as a soiling crop. .....

Report Blank, Experiment No. 6. C.

Sowing Rape on Plot With Oats in Accordance With Directions Given on Information Sheet.

Name of experimenter .....
P. O., ...; County .....; State .....

1. Date of sowing .....
2. What variety of rape used? .....
3. Nature of soil? .....
4. Amount of seed used per acre? .....
5. How prepared? .....
6. When were the rape plants first noticeable? .....
7. When were the oats cut? .....
8. Did the rape interfere in any way with the growth of the oats? .....
9. Did you experience any difficulty in cutting and binding oats on plot where rape was sown? .....
10. Did the rape interfere with the drying out of the bundles? .....
11. How long after oats were cut before rape was fit for feeding? .....

Which, in your opinion, is preferable, sowing the rape at the time of sowing oats or after the oats have reached the height of one or two inches? .....

Report Blank, Experiment No. 6. D.

Rape Sown Broadcast Without Dragging When Oat Crop Is From 2 to 4 Inches in Height Immediately Before or After a Shower.

Name of experimenter .....
P. O., ...; County .....; State .....

1. Date of sowing oats, ...

2. Date of sowing rape, ...
3. What variety of rape used? .....
4. Amount of seed used per acre? .....
5. Nature of soil? .....
6. How prepared? .....
7. Did you sow rape seed immediately before or after a shower? .....
8. When were the rape plants first noticeable? .....
9. When were the oats cut? .....
10. How did the yield of oats compare with the yield on land where no rape was seeded? .....
11. How long after oats were cut before rape was fit for feeding purposes? .....
12. How many and what kind of animals did you pasture upon the rape? .....
13. Did you feed a grain ration also?
14. Did animals fed upon the rape thrive? .....
15. Approximately, how much green fodder did the rape produce per acre? .....
16. Did you notice any detrimental effects from the feeding of rape? .....
18. Briefly give your opinion as to the value of rape as a soiling crop. .....

Experiment No. 7.

Soy Beans.

The soy bean was probably introduced into the United States from Japan about fifty years ago and has been cultivated with success in the southern states. In Japan it is used extensively as a human food, but in this country it is grown for the seed, as a forage plant, and as a soil renovator. As a forage, its use as a soiling crop is becoming recognized, by stockmen and dairymen, as it withstands the drought exceptionally well and will give a good cutting of green forage at the time when other feeds

are shriveled and wilted. Soy beans of the late variety gave a cutting of 9.9 tons green forage per acre at the Wisconsin Experimental Farm in 1900 and yielded thirty-eight bushels of seed beans per acre in 1902, and forty bushels per acre in 1903. It makes an excellent hay, and at the Kansas Station a yield of about three tons of cured hay per acre was secured.

Like the clover, the soy bean is a nitrogen gatherer and enriches the soil on which it is grown. It is said to grow on soil quite low in fertility, but a mellow, fairly rich soil is preferable. It requires a well drained porous soil; in no case should the seed be sown on low ground that is saturated with water during most of the growing period or on a heavy clay soil that is inclined to bake.

When sown for hay or a soiling crop, a drill or broadcast seeder can be used to advantage. If sown for seed, use a corn or bean planter and sow in drills about thirty inches apart and about three inches apart in the drill. When planted in drills as described, from two to three pecks of seed per acre will be used.

Soy beans should not be planted while the ground is cold; immediately after corn planting is a favorable time.

Sow in accordance with suggestions above given, for growing soy beans for seed, one-tenth of an acre.

When desired for hay, soy beans should be cut when the pods are partly developed. Try a few square rods sown broadcast for a soiling crop and for hay. When grown for seed they should be harvested and threshed as our common variety of beans and put in a large open bin and shoveled over frequently to avoid heating.

If you have a silo try soy beans with corn. Plant in drills with the corn planter using one-third soy beans and two-thirds corn mixed. When planting with corn for the silo use the Medium Green variety as this variety is noted for its great leaf development. No difficulty will be experienced cutting the soy beans with the corn harvester at the time of harvesting corn. For pasture, hay or seed the Ito San variety will give excellent satisfaction and will usually ripen before the fall frosts.

Secure a sack of inoculated soil from the Experiment Station and scatter on a portion of the field that you desire to plant to soy beans, and note the development of nodules. The roots of the soy bean plants growing on that part of the field where the bacteria-laden ground is scattered will have numerous nodules attached to them which decay in the fall and add much fertility to the soil. When a few square rods of ground are inoculated and soy beans are grown thereon, henceforth ground can always be secured from this source of supply to scatter on other fields where the desire is to have the nodules develop.

REPORT BLANK, EXPERIMENT, No. 7.

Soy Beans.

Name of experimenter, ...

P. O....., County....., State.....

1. Date of planting soy beans, ...
2. Character of soil, ...
3. What crop had been grown the previous year? .....
4. Was the land used, fall or spring plowed? .....
5. Give your method of planting. .....
6. How long after planting were beans first noticeable? .....
7. Give your method of cultivation, ...
8. Did you try a few square rods for forage? .....
9. How many pounds of green forage did you cut from a square rod? .....
10. How many pounds of cured hay did you get from a square rod? .....
11. Did the stock eat the green and cured forage readily? .....
12. What kind of stock did you feed it to? .....
13. Did the beans left for seed ripen evenly? .....
14. Date of harvesting, ...
15. Manner of harvesting, ...

16. Method of threshing, ...
17. Yield per acre of marketable seed beans, ...
18. Did you use any bacteria-laden soil for inoculation purposes? .....
19. Were nodules noticeable on the roots of the soy beans at any time during the growing period where such soil was used? .....
20. Were they noticeable where the soil was not used? .....
21. Date of sending report, ...
22. Give in a general way your opinion of soy beans as a seed and forage plant for Wisconsin, ...
.....
.....
.....
.....
.....

DIVISION OF FARM ENGINEERING.

PROF. G. N. KNAPP.

Members of the Experiment Association: We have a number of lines of work under consideration and before the end of the season I think that we will have definite propositions to offer. When we do we will co-operate with Professor Moore and correspond with members of the Association and see what work can be taken up. There is very little that I can think of that can be offered in the way of a definite line of investigation that can be taken up by the different members. There is a great deal that we want in the way of statistics. We wish to find out how many silos there are in the state. We want new data on the capacity of silos. We would like to co-operate with those who are in position to weigh the corn into the silo and weigh it out again to find out exactly how many tons of silage silos of the different sizes hold. We would be glad to hear from all members of the Association who are in position to take

up work of this sort. Again we want to study the effect of silo walls of different construction on the keeping qualities of silage. We do not know as yet what type of silo keeps the silage the best. We do not know whether wood or stone is the best. Judging from the silos in use, one type keeps silage as good as another.

Last spring I spent a month or two examining the silos and the best silage I saw was in a stave silo. This does not mean stave silos are best, but it is significant. That we can do this in connection with the Experiment Association I am not sure, but if we can have twenty different silos in different parts of the state and have samples of corn as put in and silage as it comes out, it will give us valuable data.

Another line in regard to which we want statistics is in stable ventilation. How many stables in the state are ventilated? How many farmers have made an attempt at ventilation, and what systems are used? The one definite system of ventilating, as you know, is the King system; but the King system is rarely put in correctly. I have not seen two barns in which the King system has been put in in the same way. Usually it is not the King system, strictly speaking, but is the King system, with numerous modifications. We have experimental work going on at present in three different barns; just what we will want to know further we cannot say until those experiments are done. We are getting some interesting results that are likely to modify the method of ventilating by the King system.

Another line of work that we want to take up is in connection with fences. Cement fence posts; corner posts of cement. We want observations in regard to the lasting qualities of wire fences. At present we have no way of testing the lasting quality of wire.

In the line of farm machinery we are not quite so free to experiment as we are in other things, because if we make comparisons between different machines, the manufacturers will feel they have a grievance.

FARM ENGINEERING DEPARTMENT.

G. N. KNAPP AND C. A. OCOCK.

The state of Wisconsin having a greater variety of soils than any other state of the northern Mississippi valley, necessarily calls for a greater variety of farm implements so that the farmer may attain the greatest profits for labor expended. It is not probable, however, that all farmers in the state have all the farm implements which will make their work comparatively easy, yet the greater per cent have those implements most necessary for the preparation of the seed bed, for the planting and caring for the crop, for harvesting of the same and where necessary to prepare the crop for market.

In order then that the department of Farm Engineering of the College of Agriculture may be of greater assistance to the farming classes, it is essential that we know more definitely the types of machines that are now in use in different parts of the state. The Experiment Association can greatly assist in gathering this information. It is with this purpose in mind that the following is submitted.

Report Blank.

Name .....

P. O. ....., County ....., State .....

1. What lines of farming do you follow? .....
2. What kinds of soil in your locality? .....

Please fill out the following blanks so far as possible, with reference to the kind and manufacture of implements used.

	Kind	Manufacture
3. Plows	.....	.....
4. Harrows	.....	.....
5. Disk harrows	.....	.....
6. Grain drills	.....	.....
7. Grain seeders	.....	.....
8. Corn planters	.....	.....

9. Corn plows ....
10. Potato planters ....
11. Potato diggers ....
12. Mowers ....
13. Hayrakes ....
14. Hayloaders ....
15. Hay presses ....
16. Grain binders ....
17. Corn binders ....
18. Grain separators ....
19. Traction engines ....
20. Corn huskers or shredders ....
21. How many farmers out of every ten in your locality house their implements in suitable sheds when not in use?
....
22. How many farmers in your locality do not house their implements at all but leave them out in the weather?
....

This information is desired as an aid in the study of the farm machinery of the state. All information will be treated as strictly confidential and will not be given to outside parties.

DIVISION OF AGRICULTURAL CHEMISTRY.

PROF. F. W. WOLL.

Members of the Experiment Association: I shall not take up much of your time this afternoon for several reasons. First, your Secretary placed my name on the program without asking me whether he might do so or not or without informing me of the fact, so I do not feel that much can be expected of me. In the second place, while I am sure that you have done good work for the state and yourselves in testing varieties of farm crops and in conducting experiments in the culture of different crops, I am not so confident that experiments in the line of agricultural chemistry can be carried on with much profit to yourselves or others with the conditions under which you are working. The culture of farm crops and field trials can be conducted in the ordinary routine of farm work without much extra labor or inconvenience to the grower, but experiments with different fertilizers for the comparison of the value of different feeding stuffs for various purposes call for careful weighings and considerable extra labor, that cannot as a rule be given to it under practical every-day farm conditions. Efforts made in this direction in the past have not, at any rate, been successful. If, however, any of you wish to take up some special experimental work in the study of chemical problems, I shall be glad to assist you individually to the best of my ability.

Professor Moore spoke to you about growing alfalfa, and in this connection I may say a few words as to the possible reduction of the feed bill which may come through a more general culture of alfalfa. The feed bill of the farmers of Wisconsin is very heavy. Many of you may not have given any thought to how much we pay out every year for feed for our farm animals, and especially for dairy cows.

We have in the state of Wisconsin one million dairy cows. It is impossible to tell with any degree of accuracy how much feed is purchased for these cows during the year, but we may

estimate the amount at a minimum of about two pounds per head per day for two hundred days of the year. We know that many good dairymen feed eight to ten pounds of grain a day to their cows, while others feed only a little bran or corn to cows in milk; we may safely assume, however, that two pounds per day per head is considerably below, rather than above, the actual amount fed daily by Wisconsin farmers and dairymen to their cows. Now, two pounds of grain a day for two hundred days to one million cows means four hundred million pounds, or two hundred thousand tons during the year. If we assume that wheat bran is used, since this is the most common concentrated feed purchased by Wisconsin farmers, which is found in every feed store in the state, two hundred thousand tons represents at least three million dollars worth of money. This vast sum is certainly not too high an estimate of the amount paid out every year by our farmers for concentrated feeds to our one million milch cows alone.

It has been shown that the feed bill can be reduced by the use of leguminous crops, especially alfalfa. We have in alfalfa an excellent substitute for at least a portion of the grain ration.

CHEMICAL COMPOSITION AND DIGESTIBILITY OF ALFALFA AND WHEAT BRAN.

Alfalfa hay does not vary greatly in chemical composition from wheat bran. If we consider first the crude nutrients, we note that alfalfa contains 14.3 per cent protein and bran 16.1 per cent and the non-nitrogenous organic substances (i. e., starch, sugar, fibre, and oil, this last component being multiplied by 2¼ to reduce it to its starch value) in alfalfa 72.7 per cent and wheat bran 71.6 per cent. Of the protein in alfalfa hay 74 per cent is digestible, against 79 per cent in bran. The other digestible coefficients are as follows:

	Alfalfa	Bran
Fibre	43	22
Nitrogen-free extract	66	69
Fat	39	68

By considering these figures in connection with the crude components in the two feeds we find that alfalfa contains 11.00 per cent digestible protein, against 12.9 per cent in wheat bran, and 42.3 per cent digestible carbo-hydrates and fat, against 47.8 per cent in bran. Alfalfa hay, therefore, contains in all 53.3 per cent of digestible matter and bran 60.7 per cent.

The results of comparative feeding experiments that have been conducted during the past few years corroborate these findings and show that alfalfa hay is nearly equal to wheat bran, ton for ton, as a food for farm animals. We are justified, therefore, in making comparisons on basis of the approximate figures given, which would suggest that wheat bran may be partly replaced in feed rations by feeding about ten per cent more alfalfa hay than the amount of bran to be replaced.

We shall refer to some experiments in this line that will give some specific information as to the nutritive effect and relative economy of these two feeds.

EXPERIMENTS WITH ALFALFA.

In experiments conducted during five years at the New Jersey Experiment Station they obtained an average yield of 19⅓ tons of green alfalfa from an acre of land, per year, including the first year, and when cured into hay this made 4.8 tons per acre, costing on the average $5.50 per ton. If we figure that bran is worth ten per cent more than alfalfa, ton for ton, this would mean that a saving of over fifty per cent might be effected by replacing bran by alfalfa hay in the rations fed to dairy cows. It would not be advisable of course in feeding heavy producers to do away with the grain feed entirely, but a partial substitution is advantageous and would reduce the feed bill in proportion to the amount of grain replaced.

At the Tennessee Experiment Station it was found that a ton of alfalfa or cow pea hay can be produced at the cost of from three to five dollars and that three to five tons of alfalfa can be produced on an acre of land; with prices as they have to pay, ten dollars for a ton of alfalfa hay and $20.00 a ton for wheat

bran, the saving effected by substituting alfalfa for wheat bran would be $2.80 for every one hundred pounds of butter and 19.8 cents for every hundred pounds of milk. These figures are not directly applicable to our conditions, but they corroborate the conclusions drawn from theoretical reasoning and from practical feeding experiences at other Experiment Stations and on dairy farms.

It seems entirely feasible, by feeding alfalfa, to reduce the feed bill which our farmers have to pay by a considerable amount. If we figure that one-half of the bran fed our dairy cows is replaced by alfalfa hay, it would mean a saving of at least twenty-five per cent in the cost of grain feed for the cows, which at a very low estimate would represent something like three-fourths of a million dollars a year.

OTHER LEGUMINOUS CROPS.

Other crops than alfalfa are of importance and value for this purpose, like clover, soy beans and cow peas, but alfalfa is the most advantageous for Wisconsin farmers. All these plants belong to the botanical family known as legumes. By feeding crops of this family, either as green forage, hay or silage, it is then possible to largely decrease the amount of grain which it is necessary to feed farm stock, especially dairy cows, and by so doing the production of milk and butter may be greatly cheapened.

At the New Jersey Experiment Station a ration which can be readily grown on most farms, composed of soy-bean silage, alfalfa hay and corn meal produced more milk and at a cost of 8½ cents less per hundred than another ration in which the protein was largely supplied by wheat bran, dried grains and cotton seed meal. In another experiment the gain from feeding a home-grown ration of cow-pea hay and corn silage to thirty cows for one month would amount to $37.20 more than a ration in which ⅔ of the protein was supplied in the form of purchased feeds, when milk is selling for one dollar per one hundred pounds.

The advisability of reducing the grain feed by supplying an abundance of rich leguminous feed like alfalfa is apparent from what I have said. There are, however, other factors in favor of feeding leguminous crops. These crops increase the supply of nitrogen in the soil through their power to fix the atmospheric nitrogen so that this costly fertilizer component becomes of direct value to plants. Legumes are furthermore of value to farmers because they are high in protein compounds and produce a rich manure, through the large amount of valuable fertilizing ingredients which they contain.

CHEMICAL COMPOSITION OF ALFALFA AND OTHER CROPS.

The chemical department of our Station last year co-operated with the department of agronomy in making chemical analyses of samples of the crops grown at our Station farms, viz., different cuttings of alfalfa and clovers, and of other forage plants. Some of the results of this co-operative work have been published by Professor Moore in Bulletin No. 121 of our Station. It will be noted from the tables there given that the different cuttings of alfalfa hay contained from 15.9 to 21.3 per cent of protein, and on the average 18.7 per cent, against 13.3 per cent for clover, 4.7 per cent for timothy and 6.1 per cent for brome grass.

When the weight of hay obtained from an acre of land is considered, we find that alfalfa furnished in the four cuttings, 8,900 pounds of dry matter and 1,996 pounds, or nearly a ton, of protein, against 4, 237 pounds of dry matter and 661 pounds of protein in the two cuttings of clover; that is, alfalfa yielded about three times as much protein per acre as clover, and over twice as much dry matter.

In conclusion, I wish to thank you for the kind and patient attention you have given me and to express the wish that the advantage of growing alfalfa in Wisconsin wherever possible may have been brought before you with sufficient emphasis by the preceding figures and by the facts to which I have called your attention in the preceding remarks.

BUSINESS MEETING.

Business meeting of the Wisconsin Agricultural Experiment Association, Thursday, February 9th, 1905, 8:30 A. M., Agricultural Hall.

Called to order by the president, A. L. Stone. The minutes of the last meeting were read and adopted, after which the following officers were elected:

President—A. L. Stone, Madison.

Vice-President—Wm. F. Curran, Sechlerville.

Secretary—R. A. Moore, Madison.

Treasurer—P. A. Dukleth, R. D. 40, Mukwonago.

Resolutions:—The following resolutions were reported by the committee, and unanimously adopted:

Resolution No. 1:

WHEREAS, It appears that the many fraudulent, inferior, and adulterated products on our markets at the present time, compete unjustly with those of high quality and merit, and, furthermore, that these deceptions work direct injury to the people and markets of our State and Nation and undermine the reputation thereof, therefore,

Be it resolved, By this Association in convention assembled, that it is the duty of each of its members to exert his influence against such abuses, and to earnestly support and encourage such measures, legislative or otherwise, as may at present exist or be later proposed, which tend to abate or correct the same.

Resolution No. 2:

WHEREAS, The people of the United States have received no relief in the matter of a parcel post delivery and

WHEREAS, The spread of the Rural Free Delivery system is making this a matter of vital importance to our agricultural communities, therefore,

Be it resolved, That this Convention re-affirm the resolution of last year favoring the enactment of a Parcel Post law.

Resolution No. 3:

WHEREAS, It appears to us that the development of our agriculture is of equal importance with that of our Navy and Foreign Possessions and

WHEREAS, Our Agricultural Experiment Stations are of the utmost importance to the development of our agriculture, therefore,

Be it resolved, That this Convention re-affirm its support of the bill in Congress increasing the appropriations to the Agricultural Experiment Stations.

Resolution No. 4:

WHEREAS, The people seem to feel the need of government authority over railroads sufficient to promptly abolish unjust rates, wipe out discriminations, that now breed monopoly, and to insure that railroads be conducted with such ability, economy and honesty as to serve the public well at equitable rates which will pay a just return upon capital actually invested.

Resolved, That we give state and national measures of the above nature our earnest support.

Resolution No. 5:

WHEREAS, The people of the United States are greatly inconvenienced by sending money orders of small denominations. This inconvenience could be easily remedied by the post check currency bill, now pending in congress whereby one dollar, two dollar and five dollar bills, also certificates for fractional parts of a dollar, may for postal and mailing purposes be converted at will into checks payable only to the party whose name is written upon the face thereof,

Resolved, That we heartily approve of the purpose and scope of this bill.

A resolution was offered by W. L. Ames and unanimously adopted favoring amendments to section 1, chapter 52 of laws of 1903 of Wisconsin, relative to camping on highways, making it unlawful to camp in tent, wagon or otherwise on the highways of the state of Wisconsin.

Committee on resolutions—Sherman Hubbard, chairman, Roy T. Harris, R. B. Snyder.

Report of Membership Committee—The membership committee recommended that honorary membership be conferred upon Dr. W. A. Henry, Madison; Dr. S. M. Babcock, Madison; Supt. Geo. McKerrow, Pewaukee; Hon. J. M. True, Baraboo; and Hon. G. E. Newman, Ladysmith, which was unanimously adopted.

SECRETARY'S REPORT ON STATE APPROPRIATION.

R. A. Moore, Secretary of the Association, made the following financial report which was duly adopted.

Receipts.

1904.	
Money in state treasury, February 4, 1904, time of making last report	$231 72
State appropriation for 1904	1,000 00
Total	$1,231 72

Disbursements.

1904.		
Feb. 5.	Certificate books, Tracy, Gibbs & Co.	$3 25
Feb. 26.	Am. alfalfa, $72.84; Turkestan, $75.64; 3 sacks, $.54, L. L. Olds	149 02
Feb. 26.	To services rendered by Miss Bibbs	5 00
Mch. 1.	Programs, $4.75, letter heads, $11.00, envelopes, $10.00, Democrat Prtg. Co.	25 75
Mch. 13.	Bags, printing and freight from Milwaukee Bag Co.	18 28
Mch. 16.	Bags, printing and freight from Milwaukee Bag Co.	12 60
Mch. 24.	Bags, printing and freight from Milwaukee Bag Co.	15 50
June 20.	Stamps and postal cards, Post Office	100 00
Aug. 27.	To Miss Bibbs for services	5 00
Sept. 1.	Letterheads and envelopes, Democrat Prtg. Co.	12 50

Sept. 28.	To Miss Bibbs for services	5 00
Oct. 12.	To Secretary for traveling expenses	10 86
Oct. 20.	To A. L. Stone, traveling expenses	25 50
Oct. 28.	To Miss Bibbs for services	5 00
Nov. 28.	To Miss Bibbs for services	5 00
Dec. 28.	To Miss Bibbs for services	5 00
Dec. 31.	To Burdick & Murray, for record book	2 50
Jan. 5.	3,000 two-cent and 4,000 one-cent stamps	100 00
Jan. 14.	Certificate books, Tracy, Gibbs & Co.	4 25
Jan. 20.	500 badges, Whitehead & Hoag Co.	60 00
Feb. 5.	To Miss Bibbs for services	5 00
	Total	$575 01
Feb. 4, 1905.	Total receipts in state treasury	$1,231 72
	Total disbursements from state treasury	575 01
	Balance in state treasury	$656 71

TREASURER'S REPORT.

P. A. Dukleth, Treasurer of the Association, made the following report which was duly accepted.

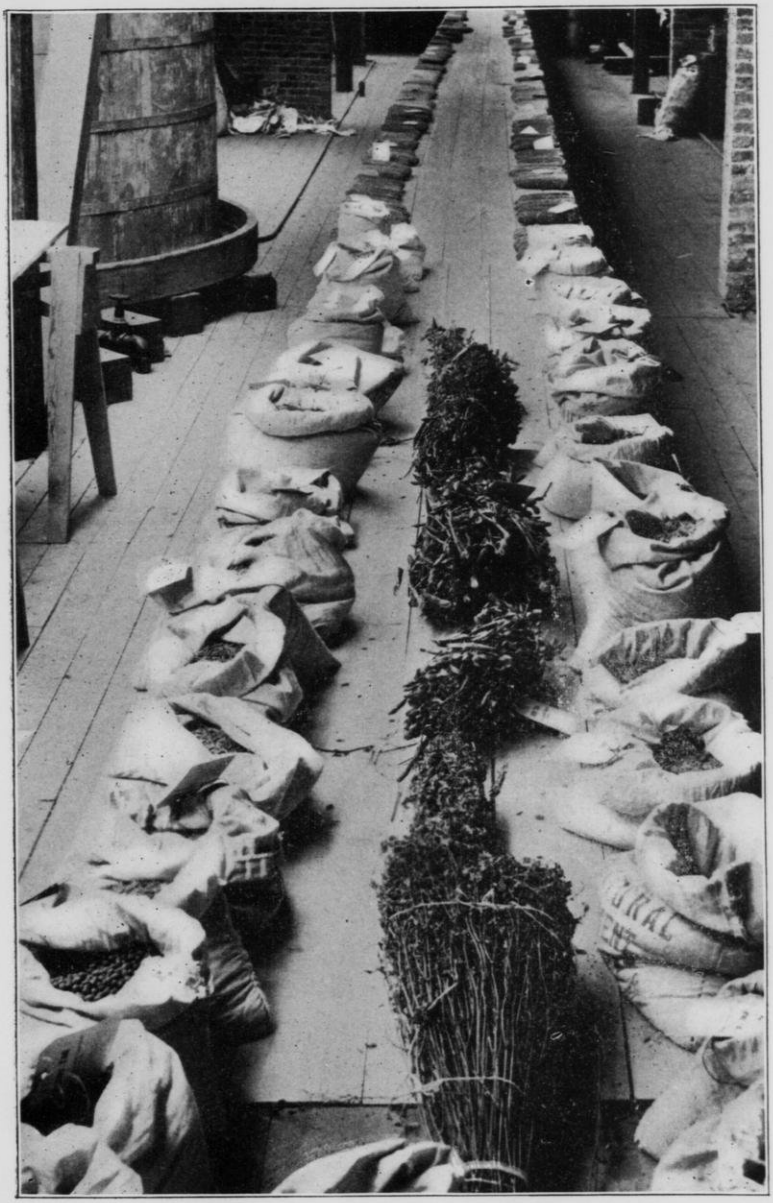
Report as rendered by Treasurer, February 9th, 1905.

Receipts.

1904.			
Feb.	4.	From H. J. Renk, former Treasurer.....	$2 00
Feb.	4.	From former Treasurer as membership fees	67 50
Feb.	4.	From member as fee	50
Feb.	4.	From members as fees	4 50
Feb.	5.	From President as membership fees	2 00
Feb.	6.	From members as fees	1 00
Feb.	12.	From President as membership fees.....	5 50
Feb.	23.	From President as membership fees.....	25 00
Mar.	3.	From President as membership fees.....	2 70
Mar.	31.	From member as fee.....	50
Apr.	6.	From member as fee	50
Apr.	11.	From member as fee.....	50
Apr.	12.	From Secretary as membership fees.....	59 00
Apr.	13.	From members as fees	1 00
Apr.	13.	From members as fees	1 00
May	3.	From member as fee	50
June	13.	From Sec'y as membership fees and stamps	17 18
June	13.	From Secretary as membership fees.....	13 00
Aug.	29.	From member as fee	50
1905.			
Jan.	23.	From Secretary as membership fees.....	40 00
Feb.	2.	From Secretary as membership fees	30 00
Feb.	8.	From members as fees	79 00
		Total receipts	$353 38

Disbursements.

1904.		
Feb. 5.	To Ella Menn, expenses attending meeting	$3 80
Mar. 4.	To money order returned to President	50
Mar. 4.	To J. M. Keys for corn	6 00
Mar. 10.	To Pantagraph for 40 copies of Feb. 12, Nos.	1 20
Mar. 31.	To Idalyn Bibbs for clerk services	5 00
Apr. 6.	To F. P. Hoopengardner for 4 bu. seed corn	8 10
Apr. 22.	To Chicago N. W. R. Co. for freight on Grain Grader	1 53
Apr. 22.	To Eureka Mfg. Co., for Grain Grader	23 57
Apr. 30.	To Idalyn Bibbs, clerk services	5 00
May 3.	To Mort Charles for services rendered	1 50
May 3.	To Clarence King for services rendered	1 50
June 1.	To Idalyn Bibbs for clerk services	5 00
June 1.	To E. J. Delwich for 5 hrs. labor @ 15c	75
June 17.	To Secretary's office for stamps	17 18
June 17.	To W. M. Hays, Sec. Am. Breeders Assn. fee for Exp. Ass'n.	1 00
June 24.	To Secretary's office for stamps	30 00
June 30.	To Idalyn Bibbs for clerk services	5 00
July 30.	To Idalyn Bibbs for clerk services	5 00
Sep. 5.	To Edward C. Nielson for photos	6 00
Sep. 5.	To Hirsch Bros. for sieve	75
1905.		
Feb. 4.	To Secretary for traveling expenses	15 48
	Total disbursements	$143 86
Fwd. Total receipts		$353 38
Total disbursements		143 86
	Balance in hands of Treasurer	$209 52



GRAINS AND FORAGE PLANTS GROWN BY MEMBERS OF THE WISCONSIN AGRICULTURAL EXPERIMENT ASSOCIATION, SEASON OF 1904.

Competing for premiums at the Fourth Annual meeting of the Association, February, 1905.

DISPLAY OF GRAINS AND FORAGE PLANTS FOR 1905.

Perhaps one of the most attractive features of the last annual meeting was the display of grains and forage plants. Nearly two hundred dollars had been set aside for premiums to be paid for the best exhibit of pure-bred seed grains. The quality of the grain displayed was of a very high standard and the interest taken in the exhibit was such that the Association deems it advisable to continue this line of effort.

We feel that much can be done in the way of encouraging the disseminaton of good seed that has been grown in our own state.

As soon as the Experiment Association demonstrates to the seedsmen and farmers of Wisconsin that good seed can be grown within our borders which is acclimated to our home conditions, it will not be necessary for them to place their orders with growers from other states. The seedsmen of our state and of adjoining states will be only too pleased to assist in the dissemination of home grown seeds if they can be shown that the quality is equally as good or better than they can get elsewhere. Realizing the great improvement that can be made in the growing of farm crops we trust that every member of the association will do all in his power to assist in every possible manner in the production of choice grain and forage plants for our next display.

MEMBERS AWARDED PREMIUMS ON PURE-BRED GRAINS AND FORAGE PLANTS AT THE WISCONSIN AGRICULTURAL EXPERIMENT ASSOCIATION MEETING, FEBRUARY 8 AND 9, 1905.

CLASS 1A.—*Best ½ peck Swedish Select Oats (Wisconsin No. 4).*

First	premium	—Otto Toepfer, Madison, Wis., R. F. D. No. 6....	$3 00
Second	"	—Gottlieb Muehleisen, Alma, Wis.....	2 00
Third	"	—Renk Brothers, Sun Prairie, Wis.....	1 00
Fourth	"	—W. E. Markey, Sullivan, Wis.....	50

CLASS 1B.—*Best ½ peck any other variety of oats.*

First	Premium	—O. C. Feathers, Manawa, Wis.	$3 00
Second	"	—Howard Capener, Baraboo, Wis	2 00
Third	"	—Ray West, Ripon, Wis.	1 00
Fourth	"	—Clyde Spaulding, Oconomowoc, Wis.	50

CLASS 3A.—*Best ½ peck Manshury Barley.*

First Premium	—Otto Toepfer, Madison, Wis., R. F. D. No.6	$3 00
Second "	—R. J. Schaefer, Appleton, Wis., R. F. D. No. 1..	2 00
Third "	—Ray West, Ripon, Wis.	1 00
Fourth "	—A. B. Hicken, Waukesha, Wis., R. R. No. 7....	50

CLASS 3B.—*Best ½ peck any other variety of barley*

First Premium	—Ray West, Ripon, Wis.	$3 00
Second "	—R. B. Snyder, Clinton Jct., Wis.	2 00
Third "	—J. M. Keys, Richland Center, Wis.	1 00
Fourth "	—Arthur Rosenow, Oconomowoc, Wis.	50

CLASS 5A.—*Best ten ears Reid's Yellow Dent Corn.*

First Premium	—Samuel J. Stienstra, Galena, Ill.	$3 00
Second "	—George Morris, Ridgeway, Wis.	2 00
Third "	—Arthur Howard, Whitewater, Wis.	1 00

CLASS 5B.—*Best ten ears Leaming Yellow Dent Corn.*

First Premium	—J. M. Keys, Richland Center, Wis.	$3 00

CLASS 5C.—*Best ten ears Clark's Yellow Dent Corn.*

First Premium	—Renk Brothers, Sun Prairie, Wis.	$3 00
Second "	—Melvin Thompson, Mt. Horeb, Wis.	2 00
Third "	—J. M. Leach, Hilbert, Wis., R. R. No. 1	1 00
Fourth "	—T. S. Hamilton, Westfield, Wis.	50

CLASS 5D.—*Best ten ears Iowa Silver King Corn.*

First Premium	—W. H. Stantorf, Barnum, Wis.	$3 00
Second "	—Adolph Suhr, Cochrane, Wis.	2 00
Third "	—Arthur Rosenow, Oconomowoc, Wis.	1 00
Fourth "	—William Raichle, Frenchville, Wis.	50

CLASS 5E.—*Best ten ears any other variety of corn.*

First Premium	—Arthur Cooper, Elizabeth, Ill.	$3 00
Second "	—C. H. Nevens, Winnebago, Ill.	2 00
Third "	—A. W. Saxe, Whitewater, Wis.	1 00
Fourth "	—J. M. Keys, Richland Center, Wis.	50

CLASS 6A.—*Best ½ peck of Medium Red Clover Seed.*

First Premium	—Renk Brothers, Sun Prairie, Wis.	$3 00
Second "	—J. H. McNown, Mauston, Wis.	2 00
Third "	—Ray West, Ripon, Wis.	1 00

CLASS 6B.—*Best ½ peck of Mammoth Clover Seed.*

First Premium	—J. H. McNown, Mauston, Wis.	$3 00
Second "	—Ray West, Ripon, Wis.	2 00
Third "	—J. M. Larson, Wautoma, Wis., R. R. No. 1	1 00

CLASS 6C.—*Best ½ peck Alsike Clover Seed.*

First Premium	—J. H. McNown, Mauston, Wis.	$3 00
Second "	—Ray West, Ripon, Wis.	2 00

CLASS 7A.—*Best ½ peck Soy Beans.*

Frst Premium	—H. E. Rosenow, Oconomowoc, Wis.	$3 00
Second "	—Arthur Rosenow, Oconomowoc, Wis.	2 00

CLASS 8A.—*Best bundle of Soy Beans.*

First Premium	—H. E. Rosenow, Oconomowoc, Wis.	$3 00
Second "	—O. C. Feathers, Manawa, Wis.	2 00
Third "	—R. A. Gillette, Verona, Wis.	1 00

CLASS 9A.—*Best sample of Alfalfa Hay.*

First Premium	—Arthur Rosenow, Oconomowoc, Wis.	$3 00
Second "	—W. L. Illian, Adell, Wis.	2 00

PREMIUM LIST 1905.

(Awards to be made February, 1906.)

DEPARTMENT OF FARM CROPS.

Class 1. Oats.

Best ½ peck Swedish Select oats (Wis. No. 4) $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best ½ peck any other variety, $3.00; 2nd, $2.00; 3rd, $1.00; fourth, 50 cents.

Class 2. Oats in Sheaf.

Best bundle Swedish Select oats, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best bundle any other variety, $3.00; 2nd, $2.00; 3rd, $1.00; fourth, 50 cents.

Class 3. Barley.

Best ½ peck Manshury Barley, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best ½ peck Oderbrucker Barley, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best ½ peck any other variety, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Class 4. Barley in Sheaf.

Best bundle of Manshury Barley, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best bundle of Oderbrucker Barley, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best bundle of any other variety, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Class 5. Corn.

Best ten ears, Clark's Yellow Dent (Wisconsin No. 1), $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best ten ears, Silver King (Wis. No. 7), $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best ten ears, Minnesota No. 13, (Wis. No. 8), $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best ten ears, North Star Yellow Dent, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best ten ears, Yellow Flint, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best ten ears, White Flint, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best ten ears, any other variety, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best single ear of corn, any variety, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Class 6. Clover Seed.

Best ½ peck of medium red clover seed, $3.00; 2nd, $2.00; 3rd, $1.00.

Best ½ peck of mammoth red clover seed, $3.00; 2nd, $2.00; 3rd, $1.00.

Best ½ peck of alsike clover seed, $3.00; 2nd, $2.00; 3rd, $1.00.

Class 7. Soy Beans.

Best ½ peck soy beans, $3.00; 2nd, $2.00; 3rd, $1.00.

Class 8. Soy Beans in Sheaf.

Best bundle of soy beans, $3.00; 2nd, $2.00; 3rd, $1.00.

Class 9. Alfalfa Seed.

Best ½ peck of alfalfa seed, $5.00; 2nd, $3.00; 3rd, $2.00.

Class 10. Alfalfa Hay.

Best sample of alfalfa hay, $3.00; 2nd, $2.00; 3rd, $1.00.

RULES AND REGULATIONS UNDER WHICH PREMIUMS ARE GIVEN.

1. The exhibitor must be a member of the Wisconsin Experiment Association.
2. Grain or forage plants must have been grown the season previous to exhibition by the exhibitor.
3. No fees will be charged for exhibiting in any classes.
4. The samples of grain and forage plants exhibited are to be retained by the Experiment Association unless a special permit is given to the exhibitor to take his sample away.
5. Exhibits are to be brought in by members of the association. If sent by express or freight all carrying charges should be prepaid.
6. Varieties of grain or forage plants not specifically named in the list can compete as "any other variety" in which case these different varieties compete against each other and not as an individual class.
7. Exhibitors cannot compete for two premiums on the same variety of grain or forage plant.
8. A proper entry of all grains, seeds, etc., must be made in the entry book at the Secretary's office before placed on exhibition tables.
9. Expert judges will be secured to place the awards.
10. The meeting of the association will be held at Madison in Agricultural Hall and rooms have been secured in that building for the exhibits.

WISCONSIN CORN STUDY.

PROF. R. A. MOORE.

The importance of the corn crop to Wisconsin is such that we are justified in putting forth a great deal of energy in the improvement of that valuable forage plant.

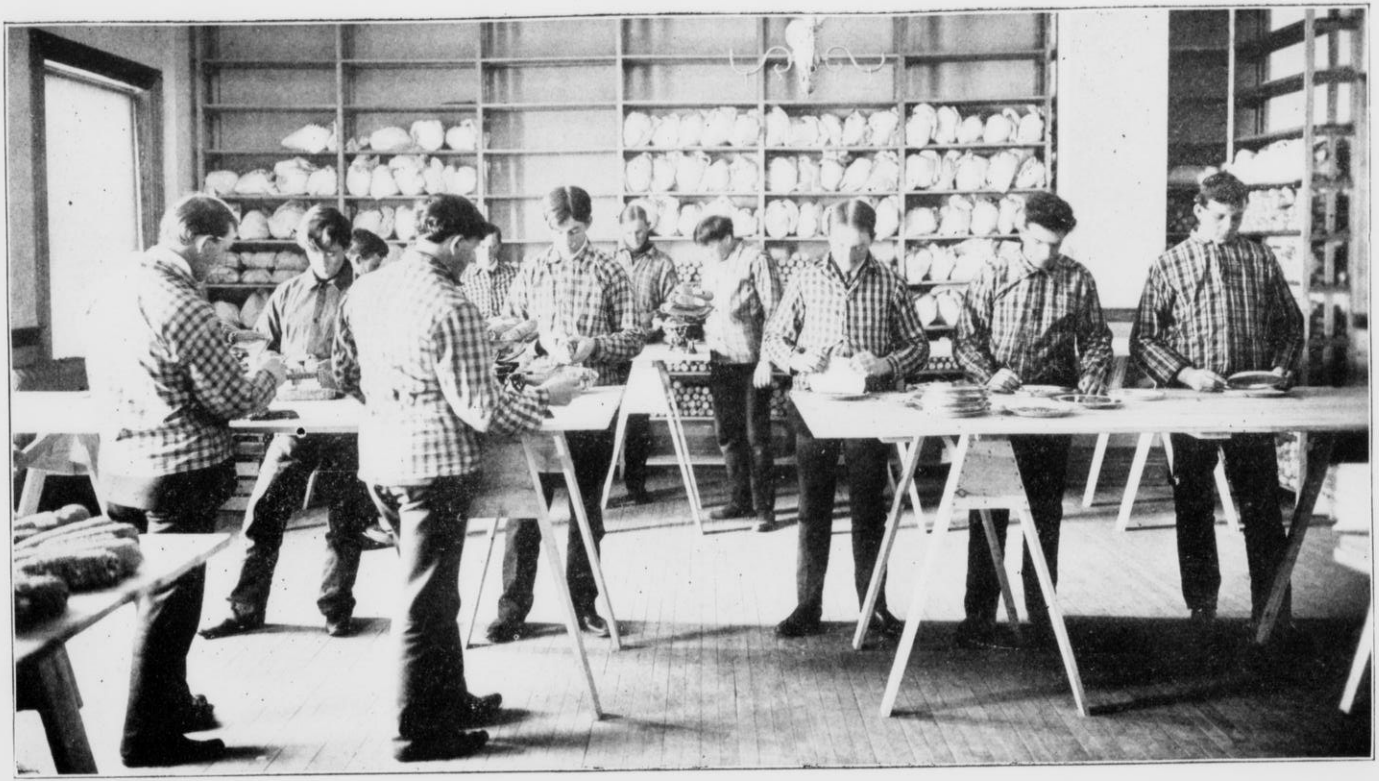
The corn crop of the United States in 1902 was two and one-half billion bushels and was valued at over one billion dollars. The corn crop exceeds the value of all the grain producing crops combined and is rightfully called "King Corn."

If the farmers of the United States could but increase the crop one bushel per acre it would increase the yield approximately one hundred million bushels. It has been fully demonstrated by corn-breeders and various Experiment Stations that the yield by careful selection of seed and cultivation, cannot only be increased one bushel per acre but can be made to double the yield per acre now received. Realizing the marked improvement that could be brought about by judicious selection of seed corn and care in growing and harvesting the crop many of the colleges of agriculture have been quick to see the importance of giving their students all the information possible bearing upon this important subject.

Wisconsin grows approximately one and one-half million acres of corn which gave an average yield of twenty-eight bushels per acre in 1902. Owing to the importance of the corn crop to the farmers of the state, the Wisconsin College of Agriculture introduced the subject of corn study in the Farmers' Course and the Short Course in Agriculture in 1903.

Important stress is put upon the selection of good seed corn. Other topics relating to testing the seed and selecting for high oil and high protein content receive careful attention.

Students are drilled by means of the score card in corn-judging which system is practiced in Illinois, Iowa, Indiana, Nebraska, Kansas and some other states.



MAKING A GERMINATING TEST OF SEED CORN—WISCONSIN COLLEGE OF AGRICULTURE.

Sacks of seed corn in the background ready for shipment to members of the Experiment Association.

SOME HELPFUL HINTS IN CORN STUDY.

As an aid to members of the Experiment Association, who will not have an opportunity to take up the systematic judging of corn, I will herewith give the score card used by the students in the college together with explanations and suggestions to emphasize corn improvement in Wisconsin.

OFFICIAL CORN SCORE CARD.

		1		2		3		4		5	
1 Trueness to Type or Breed characteristics	10										
2 Shape of ear	10										
3 Color: a. Grain	5										
b. Cob	5										
4 Market condition	10										
5 Tips	5										
6 Butts	5										
7 Kernels: a. Uniformity of	10										
b. Shape of	5										
8 Length of ear	10										
9 Circumference of ear	5										
10 space: a. Furrow between rows	5										
b. Space between kernels at cob.	5										
11 Proportion of Corn to Cob	10										
Total	100										

EXPLANATION OF POINTS IN CORN JUDGING.

1. *Trueness to Type or Breed Characteristics:* The ten ears of the sample should possess similar or like characteristics and should be true to the variety which they represent.
2. *Shape of Ear:* The shape of the ear should conform to variety type, tapering slightly from butt to tip, but approaching the cylindrical.

3. *Color: a. Grain; b. Cob.* Color of grain should be true to variety and free from mixture. White corn should have white cobs, yellow corn red cobs.
4. *Market Condition:* The ears should be sound, firm, well matured and free from mold, rot or injuries.
5. *Tips:* The tips of the ears should not be too tapering and should be well filled with regular uniform kernels.
6. *Butts:* The rows of kernels should extend in regular order over the butt, leaving a deep impression when the shank is removed. Opened and swelled butts are objectionable.
7. *Kernels: a. Uniformity of; b. Shape of.* The kernels should be uniform in shape, size and color, and true to the variety type. The kernels should be so shaped that their edges touch from tip to crown. The tip portion of the kernel is the richest in protein and oil, and hence of the highest feeding value. For this reason the tip portion should be full and plump.
8. *Length of Ear:* Northern section 8 to 9 inches, central section 8¼ to 9¼ inches, southern section 8½ to 9½ inches. Long ears are objectionable because they usually have poor butts and tips, broad, shallow kernels, and hence a low percentage of corn to cob.
9. *Circumference of Ear:* Northern section 6 to 6½ inches, central section 6¼ to 6¾ inches, southern section 6½ to 7 inches.
10. *a. Furrow between rows; b. Space between furrows at Cob.* The furrow between the rows of kernels should be small. Space between kernels near the cob is very objectionable.
11. *Proportion of corn to cob:* The proportion of corn to cob is determined by weight; depth of kernels, size of cob and maturity all affect the proportion.

RULES TO BE USED IN JUDGING.

1. *Length of Ear*—The deficiency and excess in length of all ears not conforming to the standard should be added together, and for every inch thus obtained a cut of one point be made.

2. *Circumference of Ear*—The deficiency and excess in circumference of all ears not conforming to the standard should be added, and for every two inches thus obtained a cut of one point be made. Measure the circumference at one-third the distance from the butt to the tip of the ear.
3. *Proportion of Corn to Cob*—Per cent of corn should be from 85 to 87. In determining the proportion of corn to cob, weigh and shell every alternate ear in the sample. Weigh the cobs and subtract from weight of ears, giving weight of corn. Divide the weight of corn by total weight of ears, which will give the per cent. of corn. For each per cent. short of standard, a one-point cut should be made.
4. *Color of Corn and Cob*—A red cob in white corn, or a white cob in yellow corn, should be cut at least two points. For one or two mixed kernels, a cut of one-fourth point, for four or more mixed kernels a cut of one-half point should be made. Kernels missing from the ear shall be counted as mixed. Difference in shade or color, as light or dark red, white or cream color, must be scored according to variety characteristics.
5. *Scoring Tips*—Where the full diameter of the cob is exposed, a cut of one point should be made, and a proportionate cut as the cob is less exposed. Regularity of the rows near the tip and the shape and size of the kernels must also be considered in scoring tips.
6. *Scoring Butts*—If the kernels are uniform in size and extend over the butt in regular order, give full marking. Small and compressed or enlarged or open butts are objectionable, as are also those with flat, smooth, short kernels, and must be cut according to the judgment of the scorer.
7. Ten ears of corn constitute a sample for scoring.

CORN JUDGING. LESSON I.

Trueness to Type or Breed Characteristics.

The study of corn like the study of stock is now taken up from a practical and scientific standpoint, and we trust will be carried forward to a successful issue. Score cards have been adopted by colleges in different states where the subject of corn judging is taught, with slight variations. By following the suggestions accompanying the score card and the general discussions given therein on the different divisions under which corn is judged one may become quite familiar and proficient in judging corn under the score card system.

Fairs and other associations where prizes are given for best display should provide that ten ears should be considered as a sample, as that number is now used at exhibitions in other states and should become uniform throughout Wisconsin. This number is taken as it furnishes an easy basis for calculation. The samples of corn should be arranged on tables so that the judge can have easy access to the same and pass judgment in a comfortable position and leave abundant space for comparison.

The first subject to be considered in judging a sample is trueness to type or breed characteristics, for which ten points are allowed if the sample is perfection. Corn like cattle belongs to a great family, this family being subdivided into species or breeds. We are interested in particular with the flint and dent species of corn which are grown generally. Other species we might mention are pop corn, pod corn, sweet corn, and soft corn. Each of the above species are divided into numerous races or varieties, which is brought about by the ingenuity of man combined with variation in climate, soil, cultivation, etc. The Dent corn is the great commercial corn of the United States, and that with which so much progress has been made by breeding during the past five or six years, consequently we will consider this corn specifically and the other groups generally.

The score card is arranged for Dent corn, and the rules and

suggestions given in connection with the score card refer to the Dent in general.

Different breeds of corn, like different breeds of cattle, have distinctive characteristics by which they are recognized. Those races having a particular color are easy to distinguish between, as Boone County White from Reid's Yellow Dent or either of these races from the Calico or Strawberry Dent. When one wishes to distinguish between races of the same color it is more difficult, and it is only by actual experience in handling and studying the markings that one can become proficient. The markings of pure bred races are quite distinct as the breeder working for improvement has been trying to make prominent one or more desirable characteristics. This is plainly noticeable in the Reid's Yellow Dent and the Leaming, two of the pure bred yellow races of Illinois. These varieties differ in the shade of color, the Reid's being a pale yellow while the Leaming is more highly colored, approaching an orange color. In other characterictics the Reid's Yellow Dent has a very cylindrical ear and furrows running from butt to tip, while the Leaming has more of a tapering ear and occasionally drops one or more furrows at the middle of the ear. Different seed coats are allowable in the Reid's Yellow Dent, which may be either rough or smooth with a variation in the indentation from a round dimple dent to a wide narrow dent. The Leaming has a roughened seed coat which is characteristic of the race. The races of the white corn like the yellow have certain characteristics peculiar to each race, and are readily distinguished after an acquaintanceship is formed.

The corn breeders of Wisconsin by becoming acquainted with the desirable characteristics of seed corn will work with a common interest of producing and improving these desirable qualities in the different breeds of corn that are to become standard varieties in various portions of the state. By several hundred working with the same purpose in view a race of corn will be bred having the characteristics which will be known on account of those similar traits, and the more nearly the corn conforms to this type the higher the marking can be given to it in uniformity and breed characteristics.

CORN JUDGING. LESSON II.

Shape of Ear, Cob and Kernels.

In judging the sample of ten ears of corn after considering trueness to type and breed characteristics we next examine closely the shape of the ear. Ten points are allowed if the ears are perfect in shape, but it is as difficult to find an ear of corn perfect in shape as it is to find cows, horses, and sheep perfect in shape.

The shape of ears of the different varieties of corn differ as widely as the shape and form of the different pure-bred breeds of cattle. Each race and variety has a characteristic shape peculiar to the variety to which it belongs. For example, the Boone County White corn has a long cylindrical ear, very large in circumference, while the Leaming has an ear considerably shorter, finer in cob and a general taper to cob and ear.

If the characteristic shape described in the Leaming corn were found in Boone County White, or Reid's Yellow Dent, it would be scored severely as it would not be characteristic of those breeds.

The shape most desirable to be found in corn is a cylindrical ear from butt to tip, and corn breeders are trying to secure this shape in all varieties, consequently we may expect to find in the future more uniformity in shape in the different breeds of corn.

Where ears are inclined to taper it will be noticed that one or more rows, as a rule, are dropped near the middle of the ear, otherwise the kernels on the cob are irregular being deeper and larger at the butt than at the tip. This makes the kernels vary in size throughout the ear, and renders the corn almost totally unfit for seed. No planter can plant kernels of this type so as to give a uniform stand, one of the desirable characteristics of a field of corn.

In scoring corn on shape one must take in consideration the soil and climatic conditions, under which the corn is grown.

The shape of an ear desirable for central Illinois would differ in many respects from the shape most desirable for central Wisconsin. Our shorter season demands a shallower kernel which will carry with it a different characteristic shape than that grown further south.

The characteristic wedge shape of kernel is the most desirable and this should receive consideration in judging samples or in the selection of seed for the season's crop. The wedge shape kernel carries with it a greater depth, more rows to the ear, and a greater proportion of corn to cob.

Prof. A. D. Shamel, former instructor in corn judging at the University of Illinois says: "It has been found that there is a correlation between the shape of the kernel and the composition. For instance, a kernel having a thin tip is low in per cent of oil and protein and high in per cent of starch. It is usually true that such pointed kernels are low in vitality or lack constitution. The most desirable shape is plump tips, having about the same thickness as the upper portion of the kernel."

No set rule can be given as to the exact number of points to be taken from the full score on account of any particular weakness in regard to shape. The scorer after carefully noting the deficiency in shape will rely on his individual judgment in marking the score and not be dependent on any set rule.

CORN JUDGING. LESSON III.

Color of Grain and Cob.

Having already considered breed characteristics and shape of ear, the next essential to examine is color which we consider under two heads, viz., color of grain and color of cob. Five points are allowed on color of grain and five on color of cob where each is perfect.

Yellow corn should have a red cob and white corn a white cob in pure-bred varieties. Anything to the contrary would show defectiveness in purity of breeding and should be cut severely by the corn judge and rejected as seed by the corn breeder.

The color of the corn varies with the breed, the Reid's Yellow Dent has a pale yellow color, while the Leaming has a brighter shade of yellow and these shades predominate and are characteristic of the breeds. Other breeds vary slightly in color from a pale yellow to a deep orange, and are only known by a thorough acquaintance with the variety of corn under consideration and are then cut accordingly.

The cob in yellow corn should be a bright cherry red and as the color of cobs vary from this standard, a cut should be made by the scorer. A bright cherry red cob denotes health and vigor in corn and a pale or dark red cob denotes lack of constitution or vitality. The white cobs should be a glistening white, and not a dead pale color. The above points should be considered when scoring corn at fairs or when the corn breeder is carefully selecting seed for the season's crop.

General questions, however, are often asked as to whether it is preferable to grow white or yellow corn, and which is the richest in the food elements, and which will produce the most grain and forage per acre, etc.

From tests made by careful breeders of corn and experiment stations, it has been found that in general, color makes no difference as far as quality is concerned, and it is merely a matter of taste to the grower as to the color of corn he desires.

White or yellow corn through careful breeding of one variety and neglect of the other would soon show a marked difference in regard to yield and quality in favor of the variety to which attention has been given regardless of color.

Like the breeder of live stock, the corn grower had better select that breed of corn that suits his ideal taste best, keeping in mind that the quantity and quality of marketable corn per acre are the essential characteristics sought for.

CORN JUDGING. LESSON IV.

Market Condition.

Ten points are allowed on the score card where market condition is perfect. By market condition we mean that degree of ripeness or maturity that is taken note of from the growers or feeders standpoint. Corn that shows immaturity and a tendency to be loose on the cob with wide space between the kernels should be cut severely on the score card under market condition. Where market condition is perfect or nearly so the kernels are firm on the cob and the ear gives a rasping sound when twisted. The kernels fit closely together lengthwise upon the cob between the rows and crosswise between the kernels of each row. Corn when scored from the feeders standpoint is not cut so severely as from the grower's or seedman's standpoint. When we consider that a bushel of corn plants approximately seven acres and the importance to be attached to uniformity of stand we will fully appreciate the value of considering the market condition from the grower's standpoint in a very critical way.

No one head under which corn is judged is so important to Wisconsin farmers as market condition, and all farmers of the state should not only be able to judge corn from that standpoint, but should understand how to work for the perfection of that characteristic.

Several standard varieties of corn will have to be established in various portions of the state that will ripen properly under the conditions peculiar to that section. This can only be done by securing seed corn having those desirable traits that would naturally adapt it to a certain section of the state and put it through a test. If farmers were to try this plan individually it would be many years before known varieties would be established, but Wisconsin is fortunate in the fact that it has an association of six hundred young men who are working on the corn problem, at the present time, and definite results may be looked for in a reasonable period.

The utmost importance is attached to market condition in carrying on trial tests as a variety of corn would be of little value to a community or division of the state, if it would not properly mature. Much can be done in the way of planting and cultivating the crop to hasten maturity, and this should be resorted to.

The check-row system of planting admits more sunlight and a freer circulation of air through the corn than the drill system.

The cultivator can be worked more effectually to withhold moisture, and keep down the weeds which enables the corn to gain several days in the race for maturity over corn of the same variety that has been planted in drills. Corn will gradually become accustomed to its environments and will adjust itself to varying conditions. By selecting those ears for seed that show good market condition, even if there be but few in the entire field, the earliness of the corn can be improved upon materially.

It is possible to mature the Illinois dent corns in certain portions of Wisconsin by giving them special conditions, such as location, and planting merely one kernel in a hill the ordinary width of the planter. Much good through careful work may yet be derived from the seven standard varieties of corn that have recently been established for Illinois. It seems that Wisconsin with her 1½ million acres of land annually devoted to corn should propagate in the shortest possible time, varieties best adapted for various localities, and then to hold to those established strains that annually show good market condition.

CORN JUDGING. LESSON V.

Butts and Tipps.

In scoring butts and tips we allow five points for each if perfect, but cut down in accordance with imperfections. A well filled butt that is symmetrical and not bulging is desirable. The corn should come well over toward the shank so when snapped a rounded hollow space would be plainly noticeable. The corn breeder desiring to get a large proportion of corn to cob often goes too far in breeding for a small shank and nearly a full covered butt. Where the shank is too small the ears drop off during the ripening period or readily tear off while harvesting. Where this weakness is noticeable the butt should be cut accordingly on the score card. Poorly filled butts are caused by the first silks developing too far in advance of the pollen and dried to such an extent that they do not become fertilized when the pollen ripens. All ears, where the butts are partially filled, should be rejected or this characteristic may become permanent or partially so. If an earlier variety of corn or corn more advanced should be in an adjoining field the butt kernels are liable to be mixed by being fertilized with this foreign pollen instead of the pollen from its own variety. It is largely on account of chance crossing that occurs to the butt and tip kernels that those kernels are rejected when planting. Their peculiar formation makes them non-uniform which interferes in planting evenly and they also seem weaker in germination and more tardy in growth than kernels from the middle or intermediate parts of the ear. The tip kernels are apt to be flinty and pop corn shape which is undesirable in dent corn.

A perfect tip which has a center kernel termed a cap is hard to find, but occasionally a few are found where large quantities of corn are handled. In a perfect tip the rows of corn should come over the tip in regular order and meet near the apex. The kernels should be uniform in size and shape and should

not be mixed or shallow. Where bare tips are noticeable to quite an extent, throughout the field, we allude the same to the fact that the silks formed last which represent the tips were too late for the pollen, and as a result were not fertilized.

By planting ears having defective tips that undesirable characteristic would soon become permanent or nearly so. Open tips have a tendency to increase the shallowness of kernels on the tip half of the ear which makes the corn on that portion of the ear undesirable for planting on account of the lack of uniformity compared with the kernels on the butt portion of the ear.

From the standpoint of the corn judge, butts and tips that do not meet the standard should be scored quite severely, and should carefully be rejected by the corn grower where the defect is too prominent.

CORN JUDGING. LESSON VI.

Kernel Study.

The seventh division under which ear corn is judged is kernel study for which 15 points out of 100 are allowed; 10 for uniformity and 5 for shape.

The kernels should be uniform in shape, size, and color and true to the variety type. The shape should be such that the edges of the kernels touch from tip to crown. The tip portion of the kernel, that part attached to the cob and which contains the germ, is the richest in protein and oil and hence of the highest feeding value. For this reason the tip should be full and plump. A plump tip also denotes vitality and constitution. Corn growers should regard with suspicion corn that has weak and shriveled tips no matter how well the outside of the ear may look. At least 85% of all the oil in the kernel is in the germ which extends from within the tip upward, hence corn of

high oil content is preferable for factories where the manufacture of corn oil is emphasized. The time is approaching when corn may be purchased on a basis represented by its chemical constituents instead of by the pound or bushel. Milk and cream are now purchased almost universally by their butter fat content and grains will be the next in order. Tests by the Illinois Experiment Station show that the oil content in corn may vary from 2½ to 7½ and protein from 6½ to 16. Protein is valued at 5 cents per pound while starch is less than 1 cent. It does not seem fair for a farmer who has used care in selecting high protein seed corn to be obliged to take the same price per bushel for his crop as one who is raising only ordinary corn. When Wisconsin farmers market more corn we feel confident that the matter of selling by the test will be carefully investigated. At the present time nearly all the Wisconsin corn is marketed through farm animals which undoubtedly is the best possible way of marketing farm crops. By so doing we put our animals in proper condition for the market and save middle men's profits on our crops as well as retaining the fertilizing elements contained therein to keep up the fertility of the farm.

A single kernel of corn is a fair index of the quality of all corn grown upon the cob from which it is taken, very little difference has been found in the chemical constituents of kernels taken from the same ear. A farmer with the use of a pocket knife and some knowledge of the kernel parts to examine, can judge the high and low oil and protein content nearly as well as a skilled chemist.

If seed high in protein and oil content is planted the progeny will be high in those desirable characteristics. One bushel of seed corn will plant about seven acres. Will it not then pay Wisconsin farmers to carefully select seed corn that is high in oil and proteins.

CORN JUDGING. LESSON VII.

Selecting Corn of High Oil and Protein Content.

From careful experiments carried out by the Illinois College of Agriculture extending through a series of years it has been determined definitely that the composition of the corn kernel can be materially changed. From many thousand tests at the Chicago Glucose factories it has been found that the composition of whole corn is approximately as follows:

Starch	70.0%
Water	11.4%
Protein	10.5%
Oil	4.5%
Fiber	2.2%
Ash	1.4%

It will be noted that the starch content is extremely high compared with the other elements, hence the claim that corn is a one sided ration for farm animals.

The farmer is particularly interested in the oil and protein content of the corn, consequently the richer the corn is in these elements the more money value per bushel the corn is worth for feeding purposes. Plants, like animals, do not improve if left merely to nature's laws but strive to maintain a certain standard. It has remained for man to step in and by changing environment and following certain definite principles accomplish beneficial results.

In the improvement of corn the farmer can by the proper selection of seed materially change the constituents, most desired, from a lower to a higher degree thus growing a corn of higher value for feeding farm animals. The composition of different kernels of corn taken from the same ear are approximately the same, hence a single kernel from an ear is a fair index of the composition of all the remaining kernels of that par-

ticular ear. By planting corn that is high in oil and protein the crop grown from that select seed is also high in those desirable elements.

By a physical examination of one kernel from each ear the relative composition as to oil and protein can be fairly accurately determined. No difficulty will be experienced in distinguishing between ears that are high and low, in protein and oil after a few comparisons are made.

To make these determinations all the apparatus necessary is a pocket knife. Remove at least two kernels of corn from the ear and examine closely, if that portion of the kernel next to the cob known as the tip is pointed, shriveled and has a very small face mark covering the germ, discard the ear at once, as it will be found not only low in oil but low in vitality as well. The face mark under which the germ is found should be broad and extend from the tip well up toward the top or crown of the kernel. This indicates a large germ beneath. Practically 85% of all the oil in the kernel is found in the germ which is also rich in protein, hence the desirability of a large and well developed germ. The kernel has to be cut in order to determine the protein content as that is noticeable within. The kernel should be cut from tip to crown through the narrow and broad dimensions, this will bring plainly to view the germ which is of a dark gray color; the starch which is white, and a flinty composition which is of a gravish white in white corn, and a dull yellow in yellow corn. The large portion of the protein contained in the kernel is found in this flinty matter. If the flinty portion of the kernel fits closely to the germ and crowds the white starch matter into comparatively small space, the corn upon the ear from which the kernel was selected is high in protein. After the examination of a few kernels one will make note of the relative size of the parts at a glance.

It seems that it will amply repay any farmer to select a few bushels of seed corn in this way from year to year until a high standard of corn is obtained.

SEEDLING APPLES AND THEIR PLANTERS.

A. J. PHILIPS, WEST SALEM, LA CROSSE COUNTY.

The above is a subject that has occupied my attention more or less for the past thirty years of my life, and casting about for a theme for a short address before your Society, made up as it is of the bright young men of the present generation, I choose this, as it brings to the surface interesting and useful facts and remembrances of past generations and, while as I have given it much study and thought, never has it so impressed my mind as during the past year while I have been reading and contemplating the life work of that seedling hero in horticulture, to wit, John Chapman, or "Apple Seed Johnny," as he was familiarly called by the natives of Ohio and other western states. Said facts have been gathered and the history written by the Rev. Newell Dwight Hillis of New York and to me the work is teeming full of good and valuable points. It states that Chapman first appeared in the role of a public benefactor about 1879 in Pennsylvania, where he collected seeds. That the next season, 1790, he drifted down the Ohio river in a boat filled with apple seeds. His plan was to plant these seeds in favorable places so that future settlers and their families would find orchards awaiting their coming. Around these primitive orchards he built or wove brush fences to keep the deer away and then drifted further down continuing this work without money and without price, year after year, until over 100 orchards were planted and cared for for the sole purpose of doing something to benefit posterity. Once for a long time he was lost in the forest, and when found his clothing consisted of the sacks his seeds were formerly carried in. He was dazed and nearly lost his mind, but later he recovered and spent the remainder of his life in planting seeds in summer and teaching the children of the new settlers in the winter, stamping himself as the patron saint of the American orchards. Starting his work in the 18th century, Mr. Hillis

says three motives alone can explain his strange career,—love, duty, and God. His life was full of inspiration and encouragement to the youth of to-day and for their benefit I will continue this introduction by giving some facts about the seed planters of the 19th century, with whom I have been acquainted, though at the outset I feel my inability to do the subject justice or clothe it in language like that of Mr. Hillis, and, like the Star of our Empire, wending its way westward, so my narrative will deal with planters west of Ohio and the great lakes, to-wit, Iowa, Minnesota, and Wisconsin.

From Chapman's death in 1839, until I began to be acquainted with apple seed planters in 1865, there will be a blank in these narratives, unless other hands should fill the gap. The heroes among our 19th century planters I will mention, as their memory comes to me. Some have finished their work and are gone, others are still working zealously, though they have stepped over into another century,—the 20th. Some, like Chapman, planted seeds; others, like the speaker, spent years hunting out the most valuable productions of those seeds and brought them to public notice. First, while Chapman is spoken of as the Horticultural Hero of the 18th century in the American states, I will give Peter M. Gideon the same title in the 19th century in the northwestern states, and while the benefits of Chapman's work were largely confined to the states where he so faithfully and unselfishly planted his seeds, I will say, for your benefit, that the great results of Gideon's work have taken a greater scope. His Wealthy apple is known and is being largely planted from the Atlantic to the Pacific and has produced more health, wealth, and satisfaction than any other one variety that ever originated in the northern states. I quote from the Rev. O. S. Harrison of Nebraska, whom I heard say that no diamond or gold mine was ever discovered so valuable as Gideon's work in bringing out the Wealthy apple. While Chapman dressed in summer in old sacks while planting seeds, his co-worker Gideon braved the cold of the Minnesota winters, with an old vest for a coat, with the legs of an old pair of pants sewed in for sleeves, that he might save money to buy apple

seeds. I could talk to you all evening of Gideon and his work, but I will close with one incident.

I slept with him one night and he related his experiences until nearly morning, and after breakfast we started through his large orchard, and he took me about six rods out of our way to avoid disturbing a toad that had a resting place beside the path. He said the toad was afraid of strangers, young men; that made an impression on me. I looked in his sweet, kindly face and thought a man who will do such a kind act to one of God's creatures will never be a criminal.

Only a few miles from Gideon's was another seed planter that I loved and respected for his unselfish work—H. M. Lyman. He planted the seed that produced the Lyman's Prolific, the most beautiful apple tree I ever saw, the branches of which now have a spread of over 44 feet, and has produced over thirty bushels of apples in a single year. He also planted seeds of the Wealthy that are now producing fine apples, the most promising of which are being exhibited every winter at the Minnesota meeting and state fair by his son, Mr. A. B. Lyman.

Another veteran of the Minnesota planters, whose genial face was familiar at our Wisconsin meetings, was the late J. S. Harris of La Crescent. The best of his life was spent in this work and are monuments to his memory.

In Wisconsin I well remember the genial, broad-shouldered and warm-hearted Peter Peffer, who originated the Pewaukee apple. He, too, was a horticultural hero and gave a large share of his life trying to produce something new, hardy, and valuable.

Drifting into Waupaca county, two men stand out prominent, Mr. J. J. Hatch of Iola, who planted the seeds that produced the Northwestern Greening, one of our most valuable winter apples, and Mr. E. W. Daniels, who propagated and scattered through the north the trees of that variety. Then when you look at these large specimens of handsome apples, your thoughts revert to Uncle Springer, who planted the seeds that produced the Wolf River, whose services were always available to go and help find new seedling apples.

J. C. Plumb of Milton is another pioneer whom it was my pleasure to be acquainted with. He placed the beautiful Windsor winter apple before the public. It had its origin in Dane county.

Another of the veterans who are gone was S. I. Freeborn of Richland county, who was instrumental in bringing to public notice the hardy and handsome McMahan. This originated in Richland county from seed of the Alexander.

Three other veterans who are gone that assisted in this work are Joseph Zettle of Sturgeon Bay, J. S. Stickney of Wauwatosa, and Mr. Townsend of Baraboo.

Now, to the ladies present I will say that women, too, have been heroines in this work. Mrs. E. W. Perkins of Red Wing, Minnesota, planted Malinda seeds that produced 140 varieties of apples, which received the Wilder gold medal at Boston in 1903. Mrs. Thompson of Iowa planted the seeds that produced those valuable seedlings that were grown by the Jewell Nursery Co. of Lake City. Mrs. McMahan of Richland county planted the seed that produced the apple bearing her name, and Mrs. Miller of Waupaca county, Wisconsin, planted the seeds that produced the Granite Sweet, a nice winter apple.

I cannot close without stepping over into Illinois and speaking of Mr. Minkler, who planted and introduced the seedling bearing his name, and the late A. R. Whitney, who planted seeds that produced the great and valuable Whitney No. 20, an apple largely planted in Wisconsin, also planted in the Old World.

My father, who has gone, planted in 1866 the seed of Tolman Sweet, that produced the Eureka, the beautiful sweet apple that I hold in my hand.

In closing I will speak of the seed planters who are still busy and have brought their work over into the 20th century.

First, of C. G. Patten of Charles City, Iowa, who took apple seeds from Wisconsin many years ago and produced the hardy and productive tree called Patten's Greening. He is still at work with apples and plums. The veteran, O. M. Lord of Minnesota City, who from seed of the Wealthy produced the Lord's L. apple, and who introduced the Rolling-Stone Plum;

my friend, Martin Penning of New Ulm, Minnesota, who planted the seed that produced the great and valuable Surprise plum; my friend, Yahnke, who at Winona, Minnesota, has produced the seedling that after years of care, is, in my opinion, today, the nearest to the $1,000 prize offered by the state of Minnesota for a new apple as hardy and productive as the Duchess, good in quality as the Wealthy, and that will keep as well as the Malinda, one of those apples I now hold in my hand, and that with a dozen others I have before me is the text I am talking from to-night.

I might give you personal reminiscences of all the men I have mentioned, but it is too late. Suffice it to say all were men of sterling character and though Chapman taught Sunday School in Ohio in connection with this work, so Brother Yahnke has taught Sunday School in a house he built for the purpose for the past twenty years, without money and without price, a fair example of the work of all these useful and unselfish men I have mentioned. I have visited at the homes or with the men and have seen the old trees of all the apples I have mentioned, except Chapman and Winkler, and am safe in saying to you young men that their characters are worthy of your imitation.

I thank you for your attention.

Mr. Philips enlivened his talk with some of his pleasant stories. Ed.