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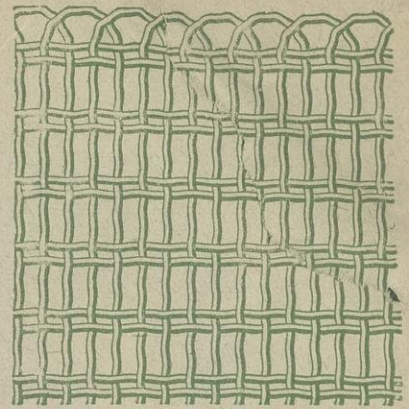
THE CANADIAN HORTICULTURIST & BEEKEEPER

Vol. 26, No. 5, May, 1918
\$1.00 per Year

TORONTO, ONT.
Address all Correspondence to Office at
PETERBORO, ONT.

"Ideal" Lawn Fence, Gates and Flower Bed Guards

Freight Paid Prices To Your Nearest Station



Style 225 "Ideal" Lawn Fence.

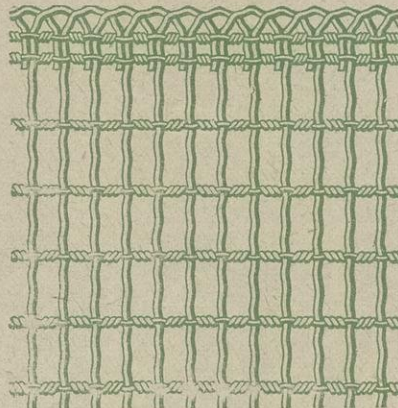
Below we give freight-paid prices to any station (except electric) in Old Ontario on orders of \$15.00 or over. Prices for New Ontario quoted on request.

Quebec and Maritime Provinces

We have opened a warehouse and office at Montreal to handle Eastern shipments and correspondence. Ask our branch, 14 Place Royale, Montreal, Quebec, for "Ideal" prices, freight paid to any station in Canada, east of Montreal.

Style No. 278 "Ideal" Lawn Fence

Uprights No. 9, crimped, securely held in place by two No. 13 gauge horizontal galvanized wires twisted together. Uprights 2 7/8 in. apart, horizontals, 6 in. apart.



Style 278 "Ideal" Lawn Fence.

Price per running foot.

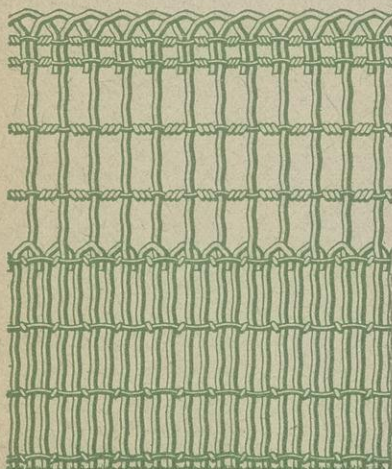
Height	Galvanized	Galvanized and painted
36 inch	10 cents	11 cents
42 inch	11 cents	12 cents
48 inch	12 cents	13 cents

Style No. 138 "Ideal" Lawn Fence

Similar in construction to Style No. 278, but made with pickets 1 3/8 in. apart at bottom.

Price per running foot.

Height	Galvanized	Galvanized and painted
36 inch	14 cents	15 cents
42 inch	15 cents	16 1/2 cents
48 inch	16 cents	17 1/2 cents



Style 138 "Ideal" Lawn Fence.

"Ideal" Lawn Gates

With filling to match any style "Ideal" Lawn Fence.

Length	Height		
	48 inch	42 inch	36 inch
3 feet long	\$3.25	\$3.15	\$3.10
3 1/2 feet long	3.50	3.25	3.15
4 feet long	3.75	3.50	3.25
10 feet long	7.00	6.75	6.50
12 feet long	8.00	7.75	7.50
13 feet long	8.25	8.00	7.75
14 feet long	8.50	8.25	8.00

For Scroll Top Gates, less than 6 feet long, add 50 cents to above same size plain.

For Scroll Top Gates, 6 feet and over, add \$1.00 to above same size plain.

Style No. 225 "Ideal" Lawn Fence

Made throughout of No. 9 hard steel galvanized wire. All wires being crimped, interlaced and locked with each other so they cannot slip. Uprights 2 1/4 inches apart, horizontals 6 inches apart, supplied in any length roll wanted.

Price per running foot.

Height	Galvanized	Galvanized and Painted
36 inch	13 cents	14 cents
42 inch	15 cents	16 cents
48 inch	16 1/2 cents	17 1/2 cents



"Ideal" Flower Bed Guard.

"Ideal" Flower Bed Guard

Design and construction correspond with the style numbers of "Ideal" Lawn Fence.

Price per running foot.

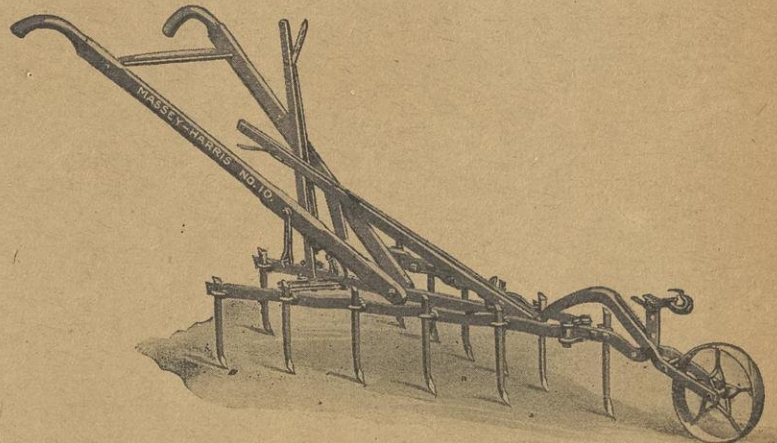
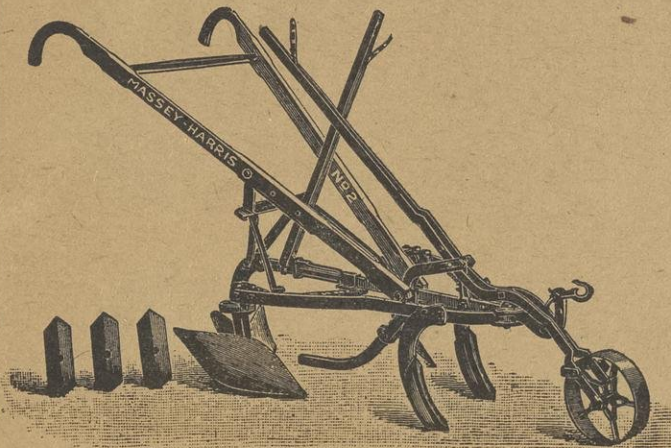
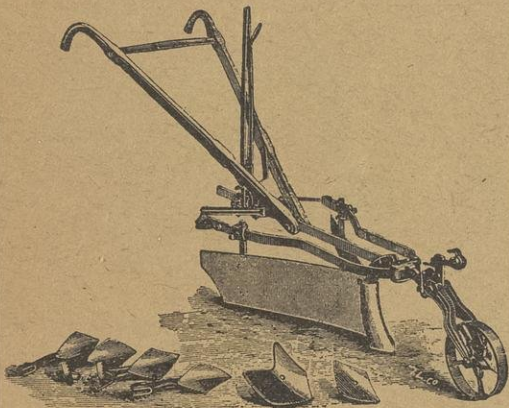
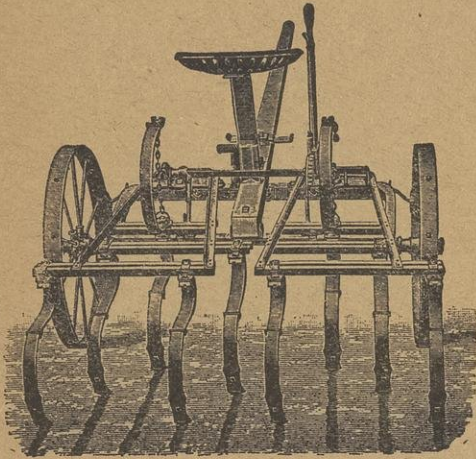
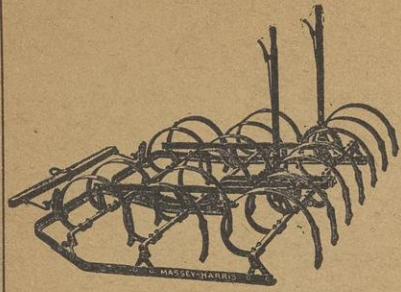
Style—No. 225

Galvanized	Galvanized and Painted
12 in. high. 18 in. high	12 in. high 18 in. high
7 cents. 8 cents.	8 cents. 9 cents.

Place Your Order at Once

"Ideal" Lawn Fence and Flower Bed Guards will be supplied in any style and length of roll wanted. If a more complete description of gates and fence is desired, send for free catalogue. Remit by Bank Draft, Post Office Order or Express Money Order.

The McGregor-Banwell Fence Co., Limited
Walkerville - Ontario



Labor Savers for the Fruit Farm

YOU can cut out a good share of the hard work by the use of suitable implements, and get good results.

Long experience has enabled us to offer you a line of cultivators, harrows, scufflers, grape and berry hoes, etc., correct in design and built in the most thorough manner.

Just as much care is exercised in the building of the smallest implement in our line as the largest, no detail is too small to receive proper attention, and it is this careful attention to the smallest detail that accounts in large measure for the confidence reposed in anything which bears the name Massey-Harris.

See the nearest Massey-Harris Agent or write and tell us your needs.

MASSEY-HARRIS CO., LIMITED

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Montreal, Moncton, Winnipeg,
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Yorkton, Calgary, Edmonton,
Vancouver, Kamloops.

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Everywhere

Almost every patch of ground is good to grow something, either in the small backyard or at the suburban home.

STEELE, BRIGGS' SEEDS

are tested both for Vitality and Purity. Dependable and largest producers every time. The following will give the desired results.

Beet, Crimson Globe. Per 1-4 lb. 85c., oz. 25c., pkt. 5c.
Beans, Black Seeded Wax. Very prolific, 1-4 lb. 20c., lb. 65c.
Cabbage, Early Summer. A good early header, pkt. 5c., oz. 60c.
Carrot, Half Long Danvers. A good yielder of fine quality, pkt. 5c., oz. 35c.
Celery, White Plume. Early, of good size and flavor, pkt. 5c., oz. 50c.
Cucumber, Steele, Briggs' Evergreen. One of the best, pkt. 5c., oz. 20c.
Lettuce, Toronto Gem. Crisp and fine flavor, pkt. 5c., oz. 30c.
Onion, Steele, Briggs' Prize Yellow Globe. Excellent, pkt. 10c., oz. 50c.
Radish, White Icicle. Crisp, brittle, excellent flavor, pkt. 5c., oz. 20c.
Tomato, Steele, Briggs' Earliest of All. The best, pkt. 5c., oz. 50c.
Sweet Peas, Spencer Hybrids. Mixed, pkt. 10c., oz. 25c., 1-4 lb. 75c., lb. \$2.00.
Nasturtium. Tall, finest mixed, pkt. 5c., oz. 20c., 1-4 lb. 60c., lb., \$2.00.

Above Varieties All Postpaid. [Full Descriptive Catalogue Free

STEELE, BRIGGS' SEED Company Limited

Hamilton, Ont.

TORONTO, ONT.

Winnipeg, Man.



White Icicle Radish

FEED THE LAND

By using the best Manure and get

GOOD CROPS

For Nurseries, Fruit Growers and Gardeners.

Sure Growth Compost

(A Composition of all Natural Manures)

Makes poor land fertile and keeps fertile land most productive.

Special low prices for Summer Shipments, May 1st to September 1st.

Supplied by

S. W. Marchment

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Telephones: Main 2841; Residence, Park. 951

Say you saw this ad. In The Canadian Horticulturist.



The Hand Scuffler in Use.

The hand scuffler is 9 inches by 3 3/4 inches; in the small one 6 inches by 2 3/4 inches. The handle is about five or six feet in length. PRICE—Direct to subscribers at 50c. for the small and 75c. for the large size. Express collect.

Special Offer

One hand scuffler (as above)—(1) With one new yearly subscription to The Canadian Horticulturist, Fruit and Floral Editions only, for 75c. Express collect.

(2) With one new and one renewal subscription to The Canadian Horticulturist, Fruit and Floral Editions only, for \$1.00. Express collect.

The Horticultural Publishing Co., Limited
Peterboro, Ontario

The Handy Hand SCUFFLER

The Ideal Garden Weeder

THE handy hand scuffler is an ideal implement for garden weeding, and mulching. It is made of the best saw steel, and has four cutting edges, on both sides and ends. Lying flat on the ground, a slight pressure either in pushing or pulling only is required. It can be used endwise to chop tough roots. It is especially adapted for cleaning around bushes and plants.

Made in two sizes. The blade on the large

The Canadian Horticulturist

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when in Toronto. We want you to get acquainted with us and our plant. Then you can see for yourself just how efficiently we can handle consignments of

Fruit and Vegetables

There will be a ready market and good prices for

Early Strawberries and Spinach

this spring, and we are preparing to handle large quantities. If you have any, ship them to us. We will guarantee you full satisfaction in the transaction.

Enquire about us and when satisfied send for shipping stamps.

WHITE & CO., Limited

Front and Church Sts. - TORONTO, ONT.

WHOLESALE FRUIT IMPORTERS
AND COMMISSION MERCHANTS

Use the "FRIEND" SPRAGUN

It shoots a revolving cloud of spray, which covers both sides of the leaf, and saves time, labor and material.

Works on any Good Power Sprayer

If you know of anyone who used a Gun in 1917, it was a "FRIEND." Ask him about the results he got from his spraying.

Actual experience has shown that one man with "Friend" Spragun on the rig, will do a bigger day's work than two men with poles, and he will do it better and with less material. The saving in material alone is very important; actual tests show that it saves twenty-five per cent. of what was required under the old system.

The "Friend" Gun Action is Quick

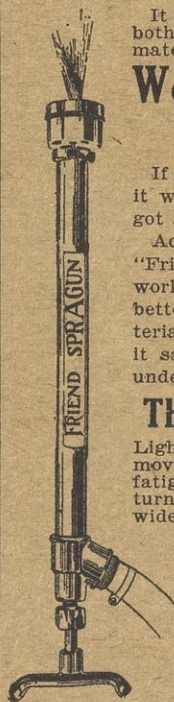
Light enough to be held in one hand, it can be moved here and there instantaneously without fatigue, and without catching or clogging. A partial turn of the wrist projects a long-distance spray, or a wide one for close range.

We are Canadian Sales Agents for the "Friend" Manufacturing Co., of Gasport, New York, manufacturers of the "Friend" power sprayers and the "Friend" Spragun.

Write us for particulars regarding this World-Famous Line.

Canada REX Spray Company, Ltd.

BRIGHTON, ONTARIO
AUSTIN McGLENNON, MGR.





An Open Letter To Horticulturists

Among all classes of Canadian men and women, it is perhaps least of all necessary to emphasize the need for increased food production to Horticulturists.

And when we speak of food production, we do not speak in the narrow sense of growing only vegetables upon small sized pieces of ground. We refer to fruit growers, to bee-keepers and to all those who know that gardening is the purest of human pleasures and the greatest refreshment to the spirit.

Use Your Influence To Stimulate Food Production

What we are most anxious to have you do is, to use your great influence as a Horticulturist to spread among all those with whom you come into contact, the gospel of increased food production. The World faces a Food Crisis. Before many moons we, in Canada, shall be placed upon food rations.

If you have a number of friends whom you think would be benefitted by receiving a good, practical book, free of charge, telling them how to grow vegetables, send their names and addresses to us, and we will send them the book with your compliments; or without mention of your name if you prefer it that way. Address

Organization of Resources Committee

In Co-Operation with Canada Food Board

Parliament Buildings - - Toronto

Long-Stemmed Asters

C. F. Arnott, Port Whitby, Ont.

THESE are few (if any) annuals that can compete with the aster for cut flowers if allowed to grow without pruning. If, however, long stems and large flowers are wanted (and I think most people would like to have them) my method of pruning will produce most beautiful long-stemmed bloom.

The centre or main stem of the aster seldom produces a perfect flower, so when the bloom is being formed I cut it off just above the laterals. The growth is then all forced into the side branches or laterals. These will shoot up and grow rapidly. Several stems and buds will start on each lateral. Keep these all pinched off, just allowing the terminal bloom to develop. It will be necessary to go over them several times, as they keep growing on for a week or two.

To grow still larger bloom and longer stems I allow only three or four side stems to grow on each plant, taking the others off before they get too large. If the grower has a good rich loam, well fertilized the previous fall, gives his plants thorough cultivation, waters them if the season is dry, and follows my instructions regarding pruning, he will be delighted with results.

We used the Canadian box for some years and were reluctant to try the Oregon box, but two years ago experimented with it, and have found that it gives the greatest satisfaction as our clients receive the apples in better condition. We always get the end in one place. We had a great deal of trouble one year in using the box with the end in two places, and will never use that kind of a box again under any circumstances.—Mr. Hinds, Forest, Ont.

BISHOP BETHUNE COLLEGE

OSHAWA ONTARIO

Visitor: The Lord Bishop of Toronto.

A Residential School for Girls.

Young Children also received.

Preparation for the University. Art Department, including drawing, painting, wood carving and art needlework. Toronto Conservatory Degree of A.T.C.M. may be taken at the School. Fine, healthful situation. Tennis, basketball, skating, snowshoeing, and other outdoor games.

For terms and particulars apply to the Sister-in-Charge, or to the Sisters, of St. John the Divine, Major Street, Toronto.

Come As You Are

Albert College is pre-eminently a preparatory school. It takes you just as you are, and fits you for whatever vocation in life you choose. The different classes include Literature, Music, Art, Theology, Physical Culture.

A Complete Business Course

can be taken at Albert. Many opportunities will open after the war for men and women trained for commercial life. Our commercial courses are under the supervision of a trained accountant, and every facility is afforded students of obtaining a thorough, practical business education.

Write us for a college calendar and particulars of course in which you are interested.

Fall term commences September 9th.

ALBERT COLLEGE, Belleville, Ont.

E. N. Baker, Principal.

ACCO SPRAY

THE KING OF BUG KILLERS

Acco Spray will save your potato and other crops by destroying all harmful bugs, moths, fleas, worms or slugs, no matter what kind they may be.

Use Acco Spraying materials. They stand all tests.

ACCO CHEMICAL CO.
Limited
TORONTO

Harold F. Ritchie & Company
Limited

Sole Agents for Canada
10 McCaul St.
Toronto, Ont.



GLADIOLUS and PAEONIES

The finest varieties in the world.

Our valuable cultural directions Free.

H. P. VAN WAGNER

R. R. No. 5, - - HAMILTON, ONT.

CABBAGE PLANTS

Of all leading early and late varieties, 45c per hundred, mail prepaid; \$2.50 per thousand, express collect. Also cauliflower, brussels sprouts, celery, onion and tomato plants. Ask for price list.

HEROLD'S FARMS

FRUITLAND - - - ONTARIO
Niagara District.

Northern Ontario

A vast new land of promise and freedom now open for settlement at 50c an acre in some districts—in others, Free.

Thousands of farmers are responding to the call. Here, right at the door of Southern Ontario, a home awaits you.

For information as to terms, regulations and railway rates to settlers, write to

H. A. MACDONELL,

Director of Colonization,

Parliament Bldgs., TORONTO, CAN.

HON. G. HOWARD FERGUSON,

Minister of Lands, Forests and Mines.

*They're
Growing
Fine!*

From Spring to Fall you'll hear this expression used over and over again, with ever-increasing satisfaction, by gardeners who have planted Ewing's Seeds.

The splendid promise of the first few weeks, marked by good germination and lusty growth, is more than fulfilled as the season advances—for

EWING'S SEEDS

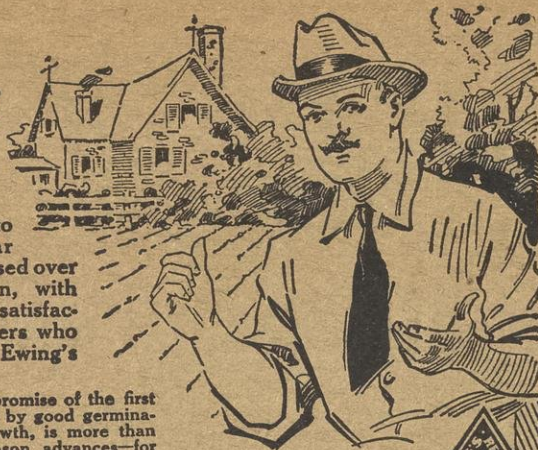
are "thoroughbreds." They come from choice selected plants, and reproduce the same.

Don't take chances—get Ewing's Seeds—the kind that for nearly half a century have been producing bumper crops. Write for our new Illustrated Catalogue, and if your Dealer hasn't Ewing's Seeds, order from us direct.

The William Ewing Co., Limited
Seed Merchants, McGill St., Montreal.

Ewing's superb blend of mixed Giant Spencer Sweet Peas

Composed exclusively of Giant Waved Spencer varieties, blended in proper proportions of bright colors and including several new hybrids of exquisite shades, many of which, when sufficiently tried up will be introduced as new named varieties. Pkt. 10c; oz. 35c; ¼ lb. \$1.00; 1 lb. \$3.35. Sent postage paid—Cash with order. 54



Good vs. Poor Seed Potatoes

Experiments have been conducted at the Central Experimental Farm, Ottawa, to compare seed of the same varieties of potatoes from various sources, in order to learn whether potatoes were better for seed from one part of Canada than from another. The results were very striking in 1907, the first year the experiment was tried, and the results each year since have shown more and more the great importance of planting seed of strong vitality and free from disease.

The yields of potatoes had been good at Ottawa up to the year 1906 from home grown seed, but in that year and the two succeeding ones the yields were poor, owing to unfavorable weather conditions. Since 1906 Ottawa seed has shown great inferiority to that grown in some other parts of Canada. Seed from Nova Scotia yielded from two to five times as much as Ottawa seed in 1906, 1907 and 1908, and Saskatchewan seed, in later years, gave differences just as great. Following are some of the results obtained:

Yields of Green Mountain potatoes from various sources, in 1917, grown side by side at Ottawa: Northern Ontario seed, 400 bushels per acre; New Brunswick seed, 341 bushels per acre; Ottawa seed, 85 bushels per acre.

Average yields of eleven varieties at Ottawa: Saskatchewan seed 368 bushels per acre; Ottawa seed, 96 bushels per acre. Seed from other parts of Canada will give just as striking differences in results.

Wherever potatoes grow vigorously, as a rule, until the tops are cut down by frost in the autumn, there will good seed potatoes be obtained, provided they are free from disease. Such sources of seed can be found in all the provinces of Canada where the days and nights during the growing season are relatively cool, and where there is usually a good supply of moisture in the soil.

There is, however, a great difference in the quality of seed stocks of the same variety in the same districts, and it is important to learn, if possible, what kind of a crop the seed came from. It has been shown by experiment at Ottawa that the best results were obtained from immature seed, where home grown seed was used, but immature home grown seed has not been found as satisfactory as seed from those parts of Canada where, as a rule, the main part of the crop is immature, though of good marketable size when the plants are cut down by frost.

Potato growers living in those parts of Canada where the potato plant dries up prematurely owing to heat or drought; or is weak in vigor from disease, will find it very profitable to obtain seed from other more favorable sources, and from the results at Ottawa it will repay them to obtain new seed every year. Even if seed is not obtained from a distance it will, it is believed, pay to use potatoes for seed which have been grown on the heavier and moister soils near home, than those which were grown in the light soils which become very hot during the summer. Experiments conducted at the Ontario Agricultural College, Guelph, Ontario, confirm the results obtained at Ottawa, both in regard to the importance of obtaining seed potatoes from the cooler parts of Canada, and in regard to the value of immature seed.—Experimental Farm Note.

The Annual Report of the Dominion Experimental Farms, including the report of the Division of Horticulture, is being distributed by the Department of Agriculture, Ottawa.



Fresh Strawberries all Season

Send card to-day for McConnell's 40-page Free Plant catalogue. Tells you about the great Everbearing Strawberries and Raspberries; also standard varieties of Strawberries, Raspberries, Currants, Gooseberries, Grapes, Asparagus, Seed Potatoes, Fruit Trees, Shrubs, Ornamentals, Roses, Etc.

H. L. McCONNELL & SON

Port Burwell, Ontario

Spraying Insures Profitable Crops

You know that as well as we—no need to argue that point. The only question for you to consider is, which sprayer is the best and most satisfactory for your purpose. Listen—

Our experts made a careful, personal study of the actual spraying requirements for every possible condition, and then designed a sprayer for each need—not one for all.

The result is, that Spramotors will give greater satisfaction and longer service in your particular field than any other sprayer you can possibly buy. Made in many different styles—both hand and power. Write for free descriptive booklet and treatise on Crop Diseases.

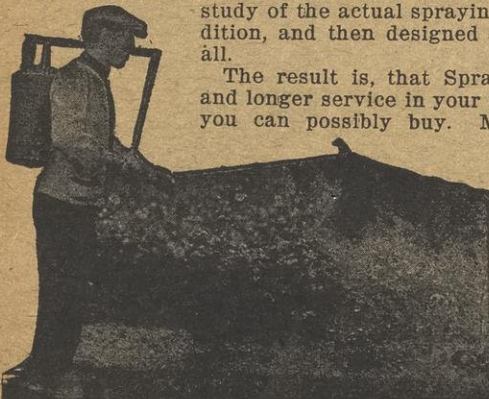
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Made in Canada. No duty to pay.

Spramotor Works

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A WAR GARDEN for EVERY HOME

The Best Seeds That Grow! Steele, Briggs Seeds

Nothing better to sow or plant for good results. Tested on our own grounds—and proved also at experimental farms.

Send for our new catalogue. It is free. It tells all about them. If you cannot get them from your local dealer, send to us direct.

Steele, Briggs Seed Co.

Limited

"Canada's Greatest Seed House."

HAMILTON TORONTO WINNIPEG

It is recognized by our public men and leaders that the food situation is graver than at any time since the beginning of the war. If Great Britain and our Allies are to be kept supplied with food the utmost efforts must be made to secure a larger production. Thus the food supply becomes a vital factor in the final decision.

Too much emphasis cannot be placed on the value of vacant lot and back yard gardens. Every citizen who can possibly produce food will render a great service, no matter how small his contribution may be. If every home had its war garden this year, what an enormous amount of food would be produced collectively. In Port Arthur last year the Garden Club produced \$26,527 worth of vegetables. One plot, 50 x 100 ft., grew \$203.36 worth of food.

Financial gain is not the only profit, for gardening inculcates lessons of industry and thrift. The pleasure, too, of eating vegetables grown in your own garden is something to be remembered.

CULTIVATION—When preparing your garden be sure to cultivate it well. Well cultivated ground is essential to success. It must also be carried on throughout the summer to keep down weeds and conserve the moisture in the ground.

GOOD SEED—Above all things, secure good seed—with the best germinating qualities. Labor and soil count for little when poor seed is used.

FERTILIZER—For best results most soils, particularly vacant lots and back yards need at least some fertilizer. A quantity of commercial fertilizer will go far toward ensuring a satisfactory crop.

INSECTICIDES—Do not let the insect pests and blight take the cream off your crop. By spraying your vegetables at the proper time you will secure healthy, growing plants.

Any of the leading seed, fertilizer and insecticide firms are always only too pleased to supply special information regarding any crop.

Your valuable time and your valuable labor will bring the best results only when you sow reliable seeds.

KEITH'S SEEDS

Are Proven Reliable

before they are sold to you.

Over half a century of public confidence.

GEORGE KEITH & SONS

124 King Street East

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SPRAY-SPRAY-SPRAY

— TO —

Increase Production

— BUY —

**SOLUBLE SULPHUR
LIME SULPHUR
ARSENATE OF LEAD**

(Paste or Powdered)

EVERYTHING FOR SPRAYING

Highest Quality New Stock
Immediate Shipment

Niagara Brand Spray Co.,
Burlington Limited Ontario

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CLASSIFIED ADVERTISEMENTS

Advertisements in this department inserted at the rate of 15 cents a line, each line averaging seven words. Part lines count as whole lines, minimum of two lines accepted. Strictly cash in advance.

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CAL-ARSENATE

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Books and Bulletins

During the past few months a number of unusually fine books and bulletins dealing with the fruit, flower and vegetable growing have reached The Canadian Horticulturist. Among them are the following:

The Principles and Practice of Pruning, by M. G. Kains, Lecturer on Horticulture in Columbia University, is a book of over 300 pages, well illustrated, that deals with the whole subject of pruning in a practical, comprehensive yet simple manner. The illustrations are particularly valuable. It may be purchased through The Canadian Horticulturist for \$2.

The World Book Company, Yonkers-on-Hudson, New York, has compiled a farm diary which is a business record and account book that has been prepared after the plan outlined by E. H. Thomson, of the United States Department of Agriculture. It contains suggestions for keeping cash accounts, and is so ruled and arranged as to greatly facilitate the keeping of accurate records of farm sales and expenditures. The price is \$1.50 post paid.

A very complete bulletin, well illustrated, dealing with the Control of Diseases and Insect Enemies of the Home Vegetable Garden, being Farmers' Bulletin 856, may be had on application to the Division of Publications, the United States Department of Agriculture, Washington.

People desiring to encourage boys and girls to take an interest in gardening, should secure a report of the "Potato Growing Contests for boys in Carleton and Russell Counties," which is being distributed through the Canadian Seed Growers' Association, Ottawa.

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Yours truly,
JOE BOOTHROYD,
Surrey Centre, B. C.

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Bowesville, Ont.

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THE BANWELL-HOXIE WIRE FENCE COMPANY, Ltd.

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The Canadian Horticulturist and Beekeeper

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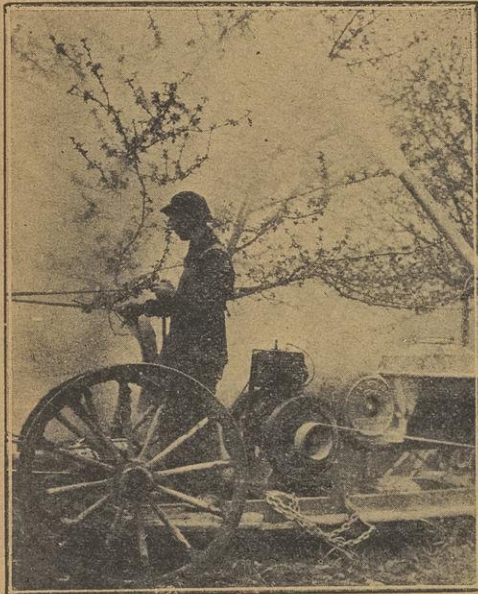
TORONTO, MAY, 1918

No. 4

Dusting vs. Spraying in Nova Scotia

Paul A. Murphy, in Charge of Plant Disease Investigations in Prince Edward Island and Nova Scotia

APPLE dusting has become very familiar to many orchardists in the Annapolis Valley since we tried it for the first time in 1916. Following the successful results of that



Dust spraying in a Nova Scotia orchard. (Photo by Paul A. Murphy).

year the work has been continued along the same lines. As the writer pointed out at the last meeting, it is necessary that this method of controlling insects and diseases which infest the apple should be tried for a number of years before we can be assured of its general utility. The somewhat conflicting results obtained this year have emphasized this point.

Conditions of Test.

The work under review was carried out on a uniform block of Gravenstein apples, the property of Mr. S. B. Chute, at Berwick. The trees were in good condition, being pretty well pruned, and not too large. The orchard was comparatively open, allowing good air circulation and permitting easy manipulation of the duster. It was situated on a gentle slope facing the northwest and the soil was light. The plots consisted of ten trees each. The records were

made from four trees in each plot as a rule, these trees being selected before the spraying began. In a few cases the number of trees from which records were taken was less than four.

The applications were made as nearly as possible according to schedule. Great difficulty was experienced in getting all the applications made on the same day owing to unsettled weather conditions. This is a point of great importance in experimental work in which various treatments are being compared, but it was impossible to observe the rule last year. The spray was put on on two days before the dust at the time of the first application, and one day after the dust at the time of the third and fourth.

The principal portion of the work was devoted to a comparison of dusts of various strengths and composition with lime-sulphur and a combination of lime-sulphur and Bordeaux, both in strengths recommended by Messrs. Brittain and Sanders in the 1917 spray calendar. The poisons used in the spray were also those recommended in that publication. Three of the dusts used were composed of powdered sulphur and arsenate of lead, with a filler in some cases. The strengths were: Sulphur, 50 per cent.; arsenate of lead, 10 per cent; tobacco filler, 40 per

cent. (50, 10, 40); sulphur, 75 per cent., arsenate of lead, 10 per cent., talc filler, 15 per cent. (75, 10, 15); and sulphur, 90 per cent., arsenate of lead, 10 per cent. (90, 10, 0). The fourth dust was made of powdered precipitate from Bordeaux mixture, 10 per cent. arsenate of lead 10 per cent., filler 80 per cent. The dust was obtained from the Niagara Sprayer Co., and was applied by means of the large orchard duster of the same firm. The dust for each plot was weighed and put on at the rate of 2 lbs. per tree at each application. The first spray was put on with mist nozzles, and the other three with the Friend gun.

So far as the orchard which was treated is concerned, it is easy to draw conclusions from the figures in the table. Referring to Table I., we see that the 90:10:0 sulphur is decidedly superior to the weaker mixtures and is about equal to the Bordeaux dust, although the latter was used but three times owing to shortage of material. These two dusts are slightly superior to the liquid sprays used in a number of blemished apples in the pack out. This superiority is brought about by better insect control, but the protection afforded by the dust against apple scab is not as good as the spray provides. It will be noted that there is

TABLE I.

Percentage of apples affected with apple scab and insect injuries and pack out of crop.

Plot.	Materials used.	Strength of various applications.	Per cent. blemished apples.	Per cent. apples with apple scab.	Per cent. apples with insect injuries.	Per cent. No. 1's & 2's combined.
1	Sulphur dust	50: 10: 40 50: 10: 40 50: 10: 40 50: 10: 40	10.1	8.2	1.9	70.8
2	Sulphur dust	75: 10: 15 75: 10: 15 75: 10: 15 75: 10: 15	9.8	7.1	2.7	83.2
3	Sulphur dust	90: 10: 0 90: 10: 0 90: 10: 0 90: 10: 0	3.4	1.6	1.7	86.5
4	Bordeaux dust	10: 10: 80 10: 10: 80 10: 10: 80	4.0	1.8	2.1	70.0
5	Lime sulphur	1.009 1.007 1.006 1.005	3.5	0.6	2.9	82.5
6	Lime sulphur and Bordeaux.	1.009 1.007 1.006 7: 7: 100	5.2	0.4	4.8	71.0
8	Check		38.7	32.8	5.8	46.2

*A paper read at the recent annual convention of the Nova Scotia Fruit Growers' Association.

TABLE II.

Comparison of results of 1916 and 1917.

Materials used.	Strength	Per cent. blemished fruit.		Per cent. apple scab.		Per cent. insect injuries		Per cent. No. 1's & 2's	
		1916	1917	1916	1917	1916	1917	1916	1917
Sulphur dust	90: 10: 0	5.2	3.4	2.0	1.6	3.1	1.7	93.8	86.5
*Sulphur dust	50: 10: 40	4.9	10.1	2.45	8.2	2.45	1.9	90.6	70.8
*Lime sulphur	1.009	6.9	3.5	0.2	0.6	6.6	2.9	88.6	82.5
	1.007								
	1.006								
	1.005								
Check		28.3	38.7	13.9	32.8	14.3	5.8	66.4	46.2

* Not exactly the same strength in 1916 as that given.

close agreement between the results of 1916 and those of 1917, as shown in Table II.:

In spite of the fact that the outbreak of apple scab was nearly two and one-half times as severe in 1917 as in 1916, (as measured by the check plots), the dust controlled it even better in the latter year than in the former, and in both years there was a slight margin in favor of the 90:10: dust over lime-sulphur, taking the total blemished apples and pack into account. It is evident from this also that the 50:10:40 dust failed in 1917 because it was not able to control the severe apple scab infestation of that year. So far as our experience goes it would seem safer to use nothing but 90:10 dust in Nova Scotia.

ly harmless so far as failure of the fruit to set is concerned. The same thing holds for one of the lime-sulphur plots. This may also be true for the plot six, on which the combined lime-sulphur and Bordeaux mixture formula was used. The variation between trees in the same treatment in these plots in which no serious harm was done in this way is great, because the drop depends on the number of apples which set, which the tree is not able to mature. In this way the experimental error is much increased and differences have to be large before they become significant. In those plots in which apples were sprayed off the trees by stronger mixtures and larger applications, which will be detailed next, the variations are not nearly so great.

TABLE III.

Particulars of number of apples matured, percentage of drop and of leaf injury.

Plot.	Materials used.	Strength of various applications.	Average total number of apples matured per tree.	Average percentage of original total which dropped after spraying.	Percentage of foliage burned.
1	Sulphur dust	50: 10: 40	586	17.5	1.9
		50: 10: 40			
		50: 10: 40			
		50: 10: 40			
2	Sulphur dust	75: 10: 15	884	17.3	1.2
		75: 10: 15			
		75: 10: 15			
		75: 10: 15			
3	Sulphur dust	90: 10: 0	678	13.3	1.0
		90: 10: 0			
		90: 10: 0			
		90: 10: 0			
4	Bordeaux dust	10: 10: 80	648	15.4	1.4
		10: 10: 80			
		10: 10: 80			
5	Lime sulphur	1.009	645	17.3	11.8
		1.007			
		1.006			
		1.005			
6	Lime sulphur and Bordeaux	1.009	851	27.1	10.3
		1.007			
		1.006			
		7: 7: 100			
8		754	17.2	0.0

Table III. is inserted to emphasize the harmless nature of dust both as regards the foliage and the drop. This point was mentioned a year ago, and our experience last year was the same. There is no means known by which finer foliage is produced by dusting. The amount of burning recorded on the dusted plots does not do justice to their almost perfect condition in comparison with the sprayed plots. The burning on the latter was of a much more aggravated type. Another very important point is the absence of drop due to the dust. The percentage of fruit which fell is in no case appreciably higher than in the check. Since the drop in the check plot was not due to apple scab, it follows that dusting is perfect-

We found that dusting was between six and seven times faster than spraying, even with the most expeditious equipment yet devised. On the average, 389.3 trees were treated in one hour with the duster, while the Friend gun covered only 58.5 in the same time. Even so the cost of dusting is about two and one-half times as great as that of spraying in this way, owing to the exorbitant cost of the material. The particulars of the cost of the various items in each method are set out below.

This record was taken under conditions unusually favorable for spraying, as it was close to water and it took only a matter of a few minutes to fill up from a storage tank. If the orchard were further away, there were no storage tank, and ordinary nozzles were used, the cost of spraying would possibly have been about 7c per tree.

This emphasizes the present limitations of dusting owing to the excessive cost of the materials. It is most important to realize in dusting that four or five pounds of dust costing 25c or 30c, may be blown out in the direction of a tree in an extremely short time in an effort to do thorough work when the maximum that can be afforded on the average tree of full size is about two pounds. This amount is sufficient to do good work as our experiment shows.

General Conclusions.

Sufficient experience has now been gained with apple dusting in Nova Scotia and elsewhere to warrant one in making a general statement. Neglected orchards infested with sucking insects, for the control of which by dust no present hope can be held out, the dusting method produces better foliage, and probably better finished fruit, than can be obtained in any other way. The fruit will be somewhat freer from the attacks of biting insects than sprayed fruit will be, but it will be somewhat more spotted with apple scab. The extent to which apple scab will develop in spite of the dust will depend on the season. It seems reasonably safe to say that in all but the severest outbreaks of apple scab, dusting will provide efficient protection for the crop in Nova Scotia. This has been the experience of all the growers who used it in 1917.

The question which then remains to be decided is this: Do years of exceptional scab infestations occur sufficiently rarely to warrant fruit growers in accepting the loss which such years will entail? The writer would think that many large orchardists might follow this course with advantage on account of the chance which dusting gives them in covering their whole orchard sufficiently often and at the proper time. The small fruit grower, who is under no difficulty in getting time to do his spraying, is in another position, and it is a question if he would not do better to adhere to the slower and somewhat more certain liquid applications. This is a point which can be settled only when one knows the average scab conditions, not only of the district, but even of the individual orchard.

TABLE IV.

	Materials.	Strength.	Poison.	Amt. of poison.	Amount of spray applied per tree.	Cost of materials cents.	Cost of labor cents.	Total cost cents.
Spraying	L. S.	1.007	arsenate lead	5: 100	4 gals.	2.22	1.20	3.42
Dusting	S. Dust	90: 10			1½ lbs.	9.3	0.14	9.44

Effects of War on Farm Apple Orchards*

Dr. A. J. Grant, Thedford Fruit Growers' Association

WHO will dispute the fact that the average farm apple orchard is slipping back? We may blame the scarcity of labor since the great war broke out, but if we would know the real reasons we must go back to pre-war days to find their start.

The apple industry of Ontario originated in the orchards planted by the earliest settlers. Their ideas were generous, and in many cases they planted quite a respectable orchard, so that the home table might be well supplied with apples. I have in mind one orchard in western Ontario, planted some forty years ago. It contains a few trees of nearly every variety that ever grew, and then some. The original planting was 500 trees, and the good farmer told me that his idea was to have plenty of apples for himself and perhaps a few for his neighbors. In such ways many quite pretentious orchards were literally wished upon the individual who happened to own the farm fifteen or twenty years hence. The overplus of apples found a ready sale and some of the more enterprising farmers shipped a few barrels to Great Britain. The results were surprisingly good, and a boom in orchard planting was the result. In time, practically every farm in the more settled parts of Ontario became possessed of an apple orchard, the size depending upon the enthusiasm of the owner. The export market grew to very large proportions, and the itinerant apple buyer was much in evidence in all parts of the country, where good fruit was being grown successfully. These were the days when good apples were easy to produce, and many orchards returned good crops pretty regularly with very little attention. Then the pests came in sufficient number to force the grower, who wanted real apples, to put up a fight for it. No more easy money for him, and the pests have been asserting themselves more strongly ever since.

In our section during the season of 1912, there were quite a number of unsprayed orchards which yielded a large crop of fairly clean fruit, and I believe that this state of affairs was fairly general throughout Ontario. Since then we have had such an avalanche of scab, that only very persistent care and spraying has produced a good crop of fruit. The season of 1913 was a lean one, and scab was very prevalent; 1914 showed an abundant crop with plenty of scab and plenty of worry for the grower, owing to the outbreak of the

war on the very eve of harvest. Naturally there was panic and disorganization in the apple trade and the traveling apple buyer, who has been the subject of much abuse at our hands, never had a better opportunity of justifying his existence than he did during this trying season. Money was tight and the buyer failed to show his genial countenance, with the result that thousands of barrels of apples were never picked. Associations and large owners were in a position to take good care of their fruit as usual, and they were pretty generally well rewarded for their labor. In the years of 1915 and 1916, short crops and more scab were the order of the day until the season of 1917 saw the climax of six solid years of trial and tribulation for the Ontario farmer, when he got no apple crop at all. I am fully satisfied that the severe infection of scab on the leaves during

blessing in disguise, as they were travelling toward an untimely death, and with their demise will disappear at least some of the low grade fruit that gets on the market in favorable seasons; but we may well feel concerned lest the process of elimination proceed too far and the apple industry of Ontario receive a rude jolt not easily to be recovered from.

We cannot grow an apple orchard in a night. It requires twelve or fifteen years to get our standard varieties producing commercially. What of the tremendous increase in the importation of apples during the past few seasons? Does anyone imagine that this state of affairs is going to make it any easier for the Ontario apple grower? We are losing our best markets to foreign trade because we are failing to produce sufficient high-grade fruit to supply the demand. We have too long soothed



The promise of a good crop in the Cherry Orchard of Howard Leavens, Bloomfield, Prince Edward County, Ontario.

1916 largely accounted for the dearth of apples in the following season. The trees were so robbed of their vigor through lack of healthy leaf surface, that they could not mature the buds.

Orchards Declining.

From the history of the past six seasons, is it any wonder that we see retrogression going on among our apple orchards? It required a heap of courage and no little faith on the part of any farmer, to stay with the game and take care of his trees, with the result that a great many orchards have been eliminated in the race. The elimination of many of these orchards has been a

ourselves with such clap trap as "the superior flavor of Ontario apples." We can produce an apple of superior flavor to that produced any other place in the world, but the realization of this great blessing is utterly useless unless we get busy and grow them in sufficient number to supply the trade. The people in our own great cities and towns want an abundance of first-class apples, and they have got the money to pay for them. If we Ontario growers will not produce them, they will buy from the western United States and British Columbia. We may be able to excel those districts in flavor, but they have got us

*Extracts from an address delivered at the recent annual convention of the Ontario Apple Growers' Association.



Power sprayers are necessary in old orchards where the trees are large and insect pests and fungous diseases are numerous.

beaten to death when it comes down to getting the business.

We have a number of large growers whose orchards require no paternal care on our part. These men are successful in a line of their own choice and they are keeping their orchards in first class condition and being well rewarded financially; but the fact remains that by far the largest portion of our commercial apple crop is produced in the farm orchard, owned and operated by a farmer with many and varied interests in agriculture. It is the well situated orchards in this class that are crying out for attention and they are in for a severe setback if some concerted effort is not made to reclaim them.

When we consider the millions of dollars invested in apple orchards throughout Ontario, it seems to me worse than sinful waste to allow good small orchards to deteriorate and fall by the wayside, simply from lack of care. The idea seems to be prevalent that the orchard may be allowed to stand in a state of neglect until labor conditions become normal and then whipped back into shape, at the will of the owner. The whipping back process is no easy matter. It takes both money and energy in abundance. The man who is neglecting his orchard right now because the task looks too great, will have little chance of stirring up sufficient energy to tackle it a few years hence, because the work is multiplying by leaps and bounds. I have done considerable work in rejuvenating neglected orchards and have found that it is only a mighty good one that will pay for the work of putting it back into shape.

There is another side of the story. Orchard pests never were easy to fight, even when we kept hammering away at them. Imagine what is going to

happen during any period of laxity on our part. Scab has become so prevalent during the past few years that we frequently hear farmers wonder if we are ever going to be able to grow clean apples any more. San Jose scale is finding new haunts almost daily. It is perhaps most to be dreaded, because it soon kills the trees attacked. If this disease showed any special preference for poor orchards, or even poor varieties, we might feel easier, but like affliction falling upon the just and the unjust so this pest attacks both the good and the bad orchards and the owner does not require to be in a very deep state of slumber to have the disease get the start of him.

Many of our farm orchards are too small for profitable handling. It seems to me that orchards representing anything less than 150 to 200 trees should be leased or operated on shares by some man qualified for the work. Several such orchards in the same locality, under one management, could afford power spray machinery and other equipment to run the business successfully. This scheme has worked out well in parts of Ontario and a more reasonable attitude on the part of the owners, in the matter of rent, should make a wide application of this method popular. Good money can be made by renting a few small orchards at 50 to 75 cents per annum per tree, for a term of five or six years. The farmer with a neglected orchard on his hands will realize a great deal more money in this way and his property will be getting better instead of worse.

Many of our cooperative associations are made up of small orchards which might be readily placed in the hands of fewer growers to the profit of all concerned and to the lasting benefit of the apple industry at large. The number of Fruit Growers' Associations in

Ontario is decreasing every year. The small orchard is the big difficulty. I would like to see the Cooperation and Markets Branch of our Provincial Department of Agriculture undertake to reorganize some of our associations along these lines.

Bridge Grafting

Girdled trees are frequently saved by connecting the upper and lower edges of the girdle with scions, which are inserted about an inch apart all around the trunk. This is known as bridge grafting. The more scions that are used, the more quickly they will grow together and form a new trunk, but two or three scions successfully grafted on a small tree will carry enough sap to keep the tree alive. A slanting cut is made at each end of the wound in the uninjured wood in which the ends of the scions are to be inserted. Strong, plump scions of the previous season's growth—not necessarily from the same tree, nor even the same variety, cut a little longer than the distance between the slanting cuts, are made wedge-shaped at each end. They are made a little longer than the distance between the cuts, in order that when inserting the ends into the cuts it will be necessary to bend them, and thus have them under pressure, which helps to keep them in position. After inserting, some of the inside bark of the stock should remain in contact with the inside bark of the scion, as it is here, or at the cambium layer, where union takes place. As soon as the scions are all placed, the wound, especially about the ends of the scions where inserted in the stock, is covered with grafting wax. The ends are also at the same time bandaged with a piece of sacking around the trunk to aid in keeping the scions in place and to exclude the air. The tree should then be well headed back. The scions, if properly made and inserted, should soon unite with the stock and then carry the sap to the top of the tree.

One of the most satisfactory methods of utilizing the badly girdled tree is to cut it off close to the ground and insert a scion of some good variety. This graft should grow at least three feet in height the first season and make a nice young tree.

A young tree may sometimes be saved when the girdling is well above the graft by cutting the tree back so as to remove all of the injured part. Under such conditions young trees will usually make new growth and the strongest shoot may be selected to form a new trunk and top for the tree. This method is not usually very satisfactory if the injury occurs more than two years after the tree has been planted.—Experimental Farm Note.

Celery Blight and Its Prevention

Prof. J. E. Howitt, O.A.C., Guelph

CELERY blight or late blight of celery is a common and destructive disease in Ontario. In wet seasons it is very injurious and ruins large quantities of celery, sometimes rendering patches of celery almost useless for market purposes.

On infected leaves, irregular, brownish spots usually develop. In these may be seen numerous black specks, the fruiting bodies of the fungus. The spots may be numerous and close together, and the leaf may wither and die. When the disease is bad, however, on many of the leaves the characteristic spots may not develop, but the whole leaf may be affected at once, become covered with minute black specks, dry and wither up. The lower leaves are nearly always the first to show these symptoms of the disease. The stems also are affected. On these irregular, rusty brown, somewhat water-soaked areas with the characteristic minute black specks are seen. The disease develops further after the plants are lifted and may subsequently cause serious rotting in storage.

The fungus which causes this disease is carried over the winter by spores in the diseased leaves, both in soil and manure. Infected seed is also thought to be another means by which the fungus may winter over. In our experiments to determine this point, we have failed to secure any conclusive evidence that infected seed produces blighted plants. Our experiments, however, are still in progress, and it is yet too early to come to any definite conclusions from them.

Spraying experiments to prevent celery blight have been conducted at the Ontario Agricultural College for five years. The first year both lime-sulphur and bordeaux mixture were tested, but as the result of the first year's work indicated that lime-sulphur was not as effective as bordeaux mixture in the control of blight, it was not used the two following years. The next year, however, the high cost of copper sulphate, due to the war, made it very important to find some substitute for bordeaux in the control of blight of celery. A comparative test was made, therefore, of lime-sulphur, sulfocide and bordeaux mixture, for the control of celery blight. On account of the extremely dry summer in 1916, very little blight developed. Both bordeaux mixture and sulfocide appeared to control the disease, but even in the dry season some blight developed on the rows sprayed with lime-sulphur. In 1917, only bordeaux mixture and sulfocide were tried. The bordeaux mixture

again proved satisfactory in holding the blight in check, but the sulfocide did not. So bad did the blight become on the rows thoroughly sprayed with sulfocide that it became necessary to spray them with bordeaux mixture in order to prevent the blight totally destroying the celery crop.

These experiments indicate that sulfocide and lime-sulphur cannot be recommended for the prevention of celery blight. The results of the five years' experiments, however, show conclusively that loss from celery blight can be prevented by spraying with bordeaux mixture, 4-4-40 formula. Commence spraying when the plants are in the seed bed and repeat at intervals of a week or ten days. In very hot weather some growers find that it pays them to spray as often as twice

a week. The spraying should be continued as late in the season as possible, leaving only sufficient interval for the stain of bordeaux mixture to disappear before harvesting the celery. Some men spray within two or three days of lifting the celery and claim that the subsequent washing of the celery in preparation for market removes any stain of bordeaux.

When the plants are large, it is necessary to apply the spray with good pressure in order to insure covering every particle of them. To do thorough work it is often advisable to go over every row twice at each spraying, that is to go both ways on a row. Only thorough spraying pays. The results of our experiments have been confirmed by field tests conducted under the direction of S. C. Johnston, until recently Vegetable Specialist for the Ontario Department of Agriculture. Celery spraying is now practiced by many of the large growers in Ontario.

Combating Cherry Leaf Blight

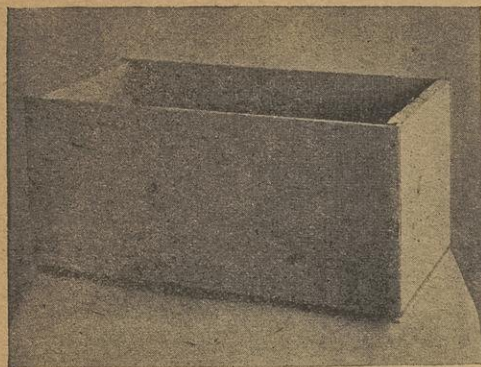
Prof. H. H. Whetzel, Ithaca, N.Y.

ONE of our most serious cherry diseases, both in the nursery and the orchard, is the leaf blight, shot hole or yellow leaf. Both sweet and sour cherries suffer from the disease. Some varieties are much more susceptible than others. In this State, of the sour varieties, the Early Richmond and Montmorency, suffer most.

The fungus which causes this disease is, like the apple scab fungus, much favored by rainy seasons. Like the scab fungus also, it winters in the old leaves of the previous season. From the overwintered leaves on the ground, spores are carried by the wind to the young leaves on the trees as they develop in



The eighth crop on a 13-year-old, Twenty-Ounce Tree, in the orchard of Jay E. Allis, of Medina, N. Y., is shown. Steady cultivation is practised and very little pruning is done when the trees are young. Mr. Allis spoke recently at meetings in the Niagara district.



The Canadian Standard Apple Box.

Fruit growers are urging that this box shall be discarded in favor of the Oregon box, which is a little shorter and wider.

the spring. Rain is necessary for their discharge into the air.

The affected leaves of sweet cherries show little evidence of shot hole, which is such a characteristic symptom of the disease on the leaves of sour cherries. In both cases there is eventually a distinct yellowing of the foliage which has given the popular name "yellow leaf." Affected leaves soon fall. In cases of severe infestation, the trees are almost completely defoliated. Where this defoliation occurs early, as it has the past season, the fruit fails to develop normal size and juiciness, and although it may turn red, is almost or quite worthless. The defoliation forces abnormal growth and diseased trees often go into winter with much immature wood. The common result is severe winter injury, not infrequently causing the death of the tree; at least a severe killing back of the branches results.

The notion that dormant spraying will prevent or greatly assist in controlling the disease is held by some of our growers. There is nothing in the known facts of the life history of the fungus to warrant such a belief. Nor is there any convincing field experience to support such a theory. An early application of lime sulphur or sulphur dust just before the blossoms open and when the leaves are expanding may possibly be important in very rainy springs, such as we experienced last season. An application just after the petals fall, another ten days or two weeks later when the shucks are falling, and a final application just after the fruit is picked will, if thoroughly made, give practically clean foliage throughout the average season. Additional applications may be profitable in very rainy seasons. Sour cherries may be sprayed with lime sulphur 1-50, or with bordeaux mixture, 5-5-50. Dusting is quite as effective, 90 pounds finely ground sulphur with 10 pounds powdered arsenate of lead being the mixture generally recommended. Bordeaux is apt to cause serious foliage injury if used on sweet cherries.

Control of Orchard Insects

G. E. Sanders, Annapolis Royal, N.S.

FUNGICIDES exert a very appreciable influence on the killing value of the poisons used. When added to bordeaux mixture the average poison is decreased in killing by about 50 per cent. This would indicate that bordeaux should not be used with poisons for the control of serious outbreaks of biting insects, in fact, ordinary insects such as budmoth, fruit worm and tussock moth will often increase when a poisoned bordeaux and nothing else is used as a spray.

Where rapid killing is desired and bordeaux is necessary as a fungicide, one may use sodium arsenate as a poison, the formula for Nova Scotia being as follows: Dissolve one pound of sodium arsenate in water, use the water solution to slake five pounds of fresh stone lime, make up to 20 gallons. Dissolve four pounds of blue stone in another 20 gallons of water and pour the two together. The sodium in this combination causes the arsenic to act rapidly, offsetting the action of bordeaux in this regard. Poisoned bordeaux made in this way is about equal in value to lime sulphur, arsenate of lime, in killing biting insects.

Value Reduced.

With lime sulphur and barium tetrasulphide it has been found that the killing value of the various poisons is reduced by from 15 to 20 per cent. This is not appreciable and the poisons may be regarded as practically as efficient with lime sulphur and barium tetrasulphide as alone. Where large quantities of poisons must be used for the control of biting insects it has been found impractical and injurious to foliage to add excessive quantities of poisons to fungicides, owing to lead arsenate when so used breaking up and forming so much soluble arsenic, and arsenate of lime when used in excess not being sufficiently protected from the action of the air by the sulphide solution.

Sodium sulphide and potassium sulphide solutions have been found to increase the killing value of poisons that are safe to use with them by from 10 to 15 per cent. This makes sodium sulphide a most valuable carrier for poisons where outbreaks of canker worms and such insects are to be combatted, and we have repeatedly used three pounds of soluble sulphur, two pounds of arsenate of lime to 100 gallons of water in such outbreaks with the greatest success—the only ill-effects from one application being from 1 to 10 per cent. of yellow leaf. In ordinary practice, we recommend the decreasing of the amount of arsenate of lime with

sodium sulphide to 1¼ lbs to 100 gallons, and the addition of from 15 to 25 pounds of hydrated lime.

In cases of outbreaks of biting insects, we have in the past recommended, and to-day rely on applications of straight lead arsenate, rather than on the combinations. From 10 to 15 pounds of standard paste lead arsenate is recommended to be applied soon after the larvae emerge. As this strength of lead arsenate is at least equal to lime sulphur and soluble sulphur as a fungicide, we feel free in recommending it straight at double or triple strength at any of the five spraying periods when an outbreak of biting insects threatens.

In comparing the various fungicides for their effect on the killing value of the poisons, the following figures from our work of 1916 gives the comparisons:

Four standard poisons used with Sodium sulphide are worth	113.1
Alone	100
With lime and sulphur	80.8
With bordeaux	56.5

Cultivating Potatoes

Douglas Maynard, Leamington, Ont.

The biggest agent in keeping the potato field clean is the blind cultivation that is given with the drag harrow before the potatoes have come up. It is much easier to destroy the young weeds just after they have germinated than after they have obtained a firm foothold. The harrow can be kept going until the potatoes are quite a size. It is well, however, to harrow the sprouting potatoes in the afternoon. I have found that the potato sprouts are tougher in the afternoon than in the morning, and will not break off so easily when the harrow is passing over them.

Potatoes need plenty of cultivation through the growing season. Try and get over them with the cultivator once a week and give them an extra cultivation after each rainstorm to break up the crust and conserve the moisture which is so essential to potatoes.

Black Heart

Prof. J. W. Crow, O. A. C., Guelph, Ont.

I am mailing you under separate cover a sample of some cuttings taken from three or four-year-old Baldwin trees, showing what we think is Black Heart. Are these trees of any use?—E. N.

If these trees are growing satisfactorily, I should leave them. In case you are in doubt, I should leave them for this year, after which, if they do not make satisfactory growth they should be replaced.

Setting Out the Blackberry Patch

Frank Hays

FOR a number of years I have set my blackberry bushes in rows six and one-half feet apart, but I believe six feet will do just as well, so this spring I shall set them that width. I mark out rows with single shovel the same as marking out for potatoes. I use plants from my own patch, usually taking them from the rows of yearlings. Wherever a branch of the black raspberry touches the ground it takes root provided the soil is loose and the season not too dry. In a well grown patch there are hundreds of such plants. But it is a good plan to go in with a hoe about the middle of August and pull some dirt over the tops, even bending down some of the branches and covering them. It will help them to take root sooner and form stronger plants.

The system I am describing requires a lot of plants, and we must be careful to propagate all we can. The first trimming of the patch should be done the following spring. There has been a lot of discussion as to whether or not it is a paying proposition to provide a trellis of some kind to support the bushes. I am one of those who consider it well worth while to wire them up. Without support of some kind the wind blows them over and breaks off a lot of good canes. And at fruiting time a lot of berries are down in the dirt and have to be discarded. Also they cannot be thoroughly cultivated while in that shape and the grass and weeds have a better chance to start and the patch has a pretty slack appearance generally.

The material to wire them will last for years, so the annual expense for material will figure low. It requires considerable labor, but that is more than balanced by the saving in bushes, the better condition of the fruit and the convenience and satisfaction of having

them in such perfect order.

I set one post at each end of the row. With a post auger I bore down four feet and put in 6 foot posts, leaving two feet above ground. Set at that depth they require no braces. Next drive a stake every thirty feet in the row. To get the stakes I take seven-foot round, white cedar posts and saw them in the middle, then quarter each half and sharpen them with a hand ax. In that way one post, costing 30 cents, will make enough stakes for a row of berries two hundred and seventy feet long. Drive the stakes down good and solid but leave at least two feet above ground. Then nail to the stakes a cross-arm, after the fashion of the cross-arm on a telephone pole. The cross-arm should be one inch thick, fourteen inches long and two or three inches wide,—whatever one happens to have,—and should be nailed 20 inches from the ground.

Now everything is ready for two trellis wires. The size of the wire should be number 12 or 14. On one of the posts of each row should be fastened a couple of ratchets, one on each side of the post. The ratchet is a little device with which the wires can always be kept tight by turning up with a monkey wrench. They cost about three cents apiece and can be secured from most any mail order house. I would not think of doing without them. The best way to attach the ratchets to the post is to first fasten one to each end of a fifteen inch piece of trellis wire by twisting the ends of the wire in the form of a hook and hooking into the eye of the ratchet, then closing up the hook so it can't slip off. Place this wire and ratchets crossways against the back of the post 20 inches from the ground and staple it midway between the two ratchets;

then take the ratchets, one in each hand, and pull them forward toward the front of the post; attach end of trellis wire to roller of ratchet and string wire to other end of row, go around the post with it and back on the other side and attach wire to the other ratchet. Lay the wires up on the cross-arms and staple them one foot apart. Don't drive staple down tight against wire, but leave so wire will slip through as it is tightened. It is a good plan to put across a tie wire half way between the stakes, otherwise the weight of the bushes is apt to spread the wires a little too far apart at those points. Any old rusty wire will do for that purpose. A roll of old telephone wire will furnish material for a long time. Now tighten up the wires by turning up the ratchets and all is ready to begin trimming.

For trimming, use leather gloves. Go down one side at a time and with pruning shears cut loose from the ground all branches on that side that have taken root and as you go along bend all branches around and up between the wires, thinning out of course, if too thick, and removing all diseased branches.

The idea of tying raspberries is, I know, more than most growers can swallow. But we tie grapevines, often making two or three ties to one cane; while with raspberries we never tie a branch more than once and much oftener two at a time, and frequently three or four at a time. Many are not tied at all as they are prevented from coming down by the tying of the others. So the work goes along quite rapidly.

To protect the hands while tying, wear cotton flannel gloves with the ends of the thumbs and forefingers cut off, which liberates the fingers so they can make the tie. The twine is cut with the pruning shears, which are held between the knees while making



The Skinner Irrigation System and Peach Orchard of the Vineland Horticultural Experiment Station, Vineland Station, Ont.



Trucking 6-qt. baskets with a Lizzie truck. Note how it saves labor. It has been proposed that the Dominion Government shall standardize this basket.

the tie. It makes an easier job of it to trim a row, then tie a row. When the trimming and tying is completed, it is time to dig out the plants from between the rows and set out a new patch. When plants are out of the way, proceed to cultivate and hoe, and do it frequently until along toward fall, —especially the cultivating. The new growth will begin to start soon after we are through trimming. Sprouts from the crowns of these yearlings will shoot upwards very rapidly and we must give attention to those shoots for they are what form the bushes that bear the fruit the following year. Go down the rows occasionally with a knife and clip the ends from all shoots that are as much as eighteen inches high. The rows will soon be a mass of green and as attractive to look at as a well-kept ornamental hedge and will attract a lot of attention, especially along in July, when they are covered with ripening fruit.

We are now done with pruning until the spring of next year, when all badly diseased bushes must be removed and the branches on those we leave cut back.

The bushes of this second year's growth are much larger and stronger than those of the first year, and with the support of the wire will stand without tying. It is a good plan at this time to bring the wires on the cross arms closer together, also to tie the wires between the stakes together. By so doing, the bushes are more firmly held back. Rake brush from between the rows and cultivate until crop is gathered; then mow it off and plow it up. Managed in this way the very finest of black raspberries can still be profitably grown.

Combating the White Grub

The white grub, which is the larva of the well known May beetle or June bug, will, it is expected, cause serious injuries in Ontario this year. The Dominion Entomological Division reports that they were very plentiful last year, and that the grubs from the eggs laid last season will grow more quickly this season and be likely to cause serious injury to the roots of various field crops. The safest crops to grow on land which are suspected of harboring grubs are alfalfa, clover or buckwheat. Such crops as corn or potatoes should not be planted in 1918 on newly broken sod land in districts where the beetles were abundant in 1917. Corn or potatoes grown on land which grew the same crops in 1917, and which were kept cultivated and comparatively free of weeds during the flight of beetles in May and June, 1917, will be reasonably safe from injury by white grubs in 1918.

Cultural Methods.

Under garden conditions, grubs are often turned up when the land is being dug or plowed. As many of these as is possible should be removed by hand and destroyed. Under acre conditions there are unfortunately no practical measures known to destroy the grubs when they are known to be present in the land, and destroying crops. Late summer plowing, which brings many grubs to the surface, crushing numbers of them and exposing others to adverse weather conditions, is useful, particularly in years when the grubs are changing to beetles.

Land known to be seriously infested and required for cropping in 1918, may be plowed in late spring, thoroughly harrowed and planted to a late crop. Such late cultivation will attract to the fields crows, blackbirds, and other birds, which are known to feed readily upon these grubs, particularly during their nesting period. Domestic fowl, such as chickens and turkeys, are also fond of white grubs and should be allowed the run of infested fields when these are being plowed.

Underdraining the Vineyard

C. C. Roosa, Buffalo, N.Y.

IN spite of good surface drainage in my vineyard, there were many places that remained wet and soggy for days after rain storms. This hindered cultivation. As a remedy and to reduce the chances of future winter injury, I put in 3,100 feet of 3-inch drain tile, laid two feet deep. Of many things I have done, I believe this underdrainage has been the greatest

single factor in improving the yield, in ripening the wood and fruit, and in promoting culture in my vineyard. Last October I put in 1,200 feet more of 3-inch tile in certain areas where the ground was heavy and wet and the vines not robust. I expect to increase the tiled area from year to year if it changes the character of the soil, as it seems to have done in the areas tiled three years ago. With good underdrainage I shall not fear another such loss by winter injury as I suffered in the winter of 1911-12.

One day in July I was repairing the outlet of one of the tile drains when a thunder shower occurred. I went under cover until the shower, which lasted about twenty minutes, had ceased. Before the shower there was no drip at the opening, but when I returned to my work immediately after the rain ceased, I was surprised to find a gushing stream of water about three inches in diameter discharging from the opening. This line of tile with its branches drained about two acres. This shows how quickly surplus ground water finds its way into the tile instead of remaining to cause soggy and mud in clay soil. There have been periods of wet weather lasting for weeks since the tile was put in, but even after heavy storms with one or two inches of precipitation, the ground could be cultivated within twenty-four or forty-eight hours, depending upon atmospheric conditions. Mud puddles are a thing of the past in my vineyard.

Some seasons have been wet for weeks at various parts of the spring or early summer which resulted in rank wood growth. During such seasons I have ceased cultivation about July 1st, instead of August 1st, for the purpose of encouraging the ripening of both the wood and the fruit at the proper time. My experience thus far leads me to conclude that this is good practice on my soil.

Fruit Jots

Early May is not too late to set out a few King raspberries, Senator Dunlap strawberries, Beta grapes, or Perfection currants.

Prune gooseberries and currants in May if it has not already been done. Take out old, weak wood and any new shoots that are crowding.

In planting, set your trees a little deeper in the ground than they were in the nursery. The reason is plain. The root growth has been reduced in transplanting, and the added depth is necessary to give the trees a grip on the ground equal to that which they had in the nursery.

Apple Scab and Its Control

Prof. H. H. Whetzel, Ithaca, N.Y.

ALTHOUGH apple scab is the oldest and best known of our apple diseases, we have not yet completely mastered it. The scab fungus seems to be one of the most persistent and versatile of our fruit foes. In most disconcerting cooperation with the weather, it constantly keeps us guessing. Even the most expert and confident fruit grower is every now and then put to rout by this surprising little fungus. Eternal vigilance, stick-toitiveness and study of its habits can alone insure a profitable contest with this foe.

Last season, like the preceding one, was exceedingly favorable to the scab pathogene and correspondingly unfavorable to the grower in his fight against it. The seasonal history of the scab in this State, as well as in other apple growing regions, where the disease appears, is consoling. The disease exhibits periods of extreme severity, followed by a series of years during which it gradually becomes less and less destructive, often to the point of all but disappearing, when with returning favorable seasons it again assumes destructive proportions. There is good reason to believe that the worst is for this time over, and that the next few years are to be years of decreasing scab severity. This does not mean that scab may be expected to disappear as by magic, and that spraying or dusting will be unnecessary. It means, however, that with weather conditions less favorable to the fungus, the grower will have the advantage, and, if he makes the most of it by timeliness and thoroughness in applying the dust or the spray, will be able to recover his losses of the seasons just past.

The experience of the last two seasons has demonstrated most convincingly the importance of preventing the primary or first infections, especially in rainy seasons. Growers who made timely and thorough applications during the pre-blossom period, almost without exception got a high percentage of clean fruit. In seasons when cool, rainy weather occurs during the pre-blossom period, primary infections are certain to be general and abundant. If the rains come early while the leaves are emerging and before they have unfolded and expanded, the infection will be on the under sides, which alone are exposed to the spores. If the rains come late, that is, after the leaves have expanded and just before the blossoms open, the spores from the old leaves on the ground will fall on the upper surfaces and on the blossom pedicels, caus-

ing the primary infections there. This will result not only in the primary scab spots being on the upper surfaces of the leaves instead of on the under surface, but may also spot the pedicels, causing the flowers to shrivel and fall without setting to fruit. Last season the primary infections occurred almost without exception very early and on the under-side of the leaves. Thus those who made the applications very early (what is commonly called delayed dormant) got best result. But this may not be the vital time to spray this season. As a matter of insurance, this delayed dormant spray may well be made. But if the weather is dry and sunny for some days following the application, the developing buds will expose the blossom pedicels and upper surface of the leaves, which must then be protected by another application before the blossoms open. If the weather is clear and

sunny during the early stages of bud development, one may well delay the first application as late as weather prospects seem to warrant. At least one application before the blossoms open should always be made. Remember, however, that the weather is the factor that determines when the applications, be they one or two, are to be put on. The man who dusts will have a distinct advantage here, because the times for effective applications before blossoms open are always very limited, a day or two at the most.

Again, dusting has proved to be as effective as spraying in the control of apple scab. In eleven orchards for which we have records for the season of 1917, the average shows: checks, 54.5 per cent scabby; sprayed, 31.6 per cent scabby, and dusted, 31.0 scabby. The discrepancy between the two methods this season is generally less than that of last season. The contention of last season that dusting would become increasingly satisfactory and effective from year to year with experience in its use, is thus borne out.

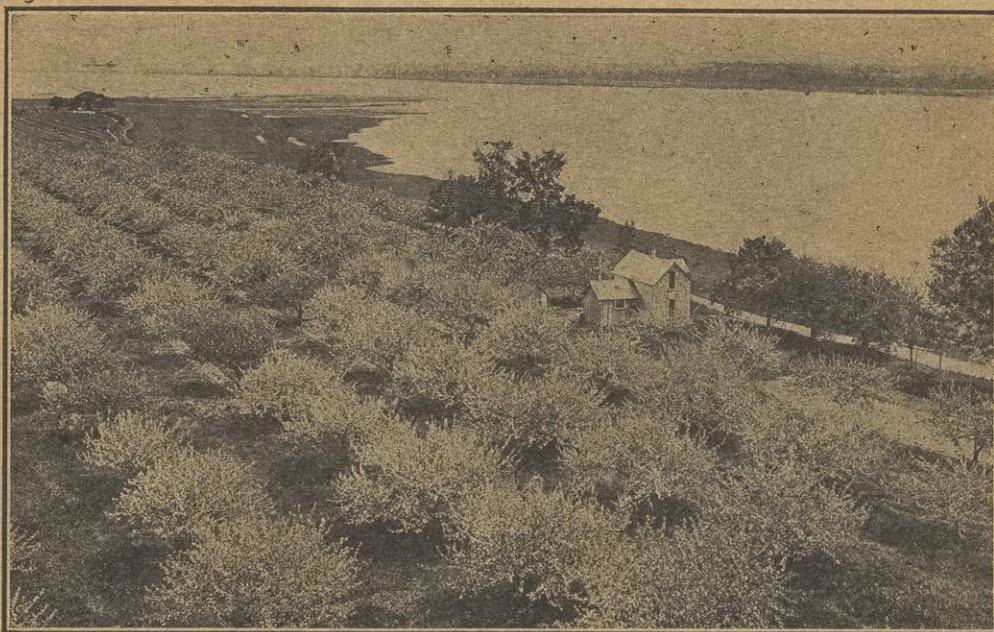
Two Necessary Sprays

Dr. A. J. Grant, Thedford, Ont.

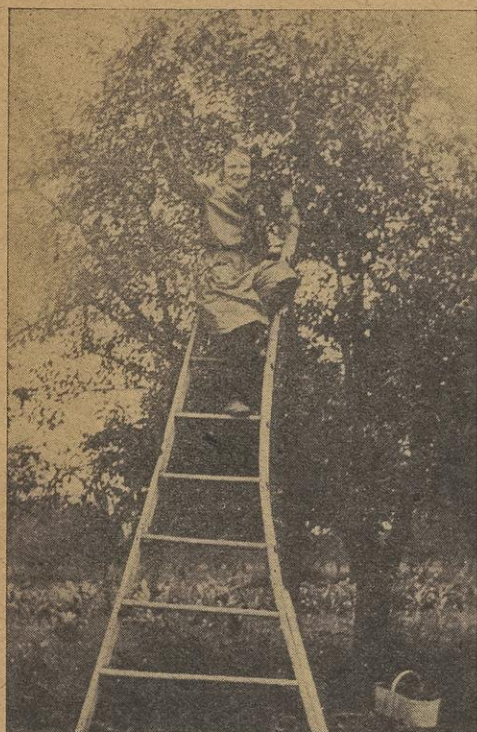
THERE are two sprayings which we should consider indispensable; the one just before the blossom opens, and the one applied when the petals have about all fallen. I do not see how we can avoid two good drenchings at these periods, and have any certainty of a good crop, but the dormant spray might be omitted if you are sure that you are free from San Jose Scale. Of course, we are speaking now of orchards that have been cared for, and therefore are free from Oyster

Shell Bark Louse. If your orchard is in a scale infested district, or if you do not feel like taking any chances, the dormant spray might be applied in the late fall, or at any time that the mixture could be handled without freezing. This covers what we regularly call our three standard sprays, and subsequent applications should be governed entirely by local conditions.

I almost invariably apply at least one spray after the fruit has formed, and sometimes two, but I have seen many



A Wealth of bloom in an orchard at Starr's Point, King's County, Nova Scotia.



No wonder fruit growers like to have National Service girls help them in their orchards.

seasons when these sprays would be quite unnecessary, and therefore, unprofitable in certain districts, when they might mean everything in a section not many miles away. This is one place where judgment on the part of the grower is of great value, as nobody can advise him, unless he is right on the job so as to understand the local weather conditions.

We are all watching the process of dusting with much interest. The procedure looks very rational. It is simply an old practice revived. The experience of years ago demonstrated that it would control fungus diseases, but the manner of application was chiefly by hand over very small areas. Personally, I have a great deal of confidence that it will finally supersede the present cumbersome method, but I fear that many improvements are necessary both in the machinery and the material before we can make the change.

A good grower pretty nearly knows what his "batting average" is going to be when he starts his men out with the spray pump; they understand the work thoroughly. Records up to date have not shown dusting to give any cleaner fruit, and the real good records have mostly been produced experimentally by men of more than usual ability along these lines, but we are all ready to admit that dusting entails less work, while the cost is not much greater. You cannot junk your spray outfit anyway until something is put in dust form to control San Jose Scale, and the new method will probably be handed to us on a more practical basis by that time.

A New Formula for Bordeaux

G. E. Sanders, Annapolis Royal, N. S.

The Thomsen-Buchanan formula, two pounds bluestone, ten pounds lime to forty gallons of water is going to be one of the most popular sprays in Nova Scotia for some time to come. In the past the big objection to Bordeaux, outside of the russetting caused by it, has been the trouble of making the mixture. In 1917 we introduced into Nova Scotia a method of shortening the time taken in mixing by the use of prepared or hydrated lime, at the same time experimenting in a commercial way with pulverized bluestone ground to pass through a screen twenty meshes to the inch. We used this last material in the orchard of Mr. S. B. Hatheway, of Fredericton, N.B., with complete success in 1917, in the following way. Weigh out the pulverized bluestone and dump it into the spray tank, start the engine and agitator and start filling. In the five to fifteen minutes of filling with the agitator running, the bluestone is dissolved. As soon as the tank is full, the agitator still running, add the hydrated lime and then the poison. This method calls only for the handling of dry material and makes the engine do what previously took a great deal of time and a system of large overhead tanks in a commercial orchard. Bordeaux should always be tested and the best way is to use litmus paper, which can be obtained at any drug store. If it does not turn the paper blue at first, add lime until it does.

Treating Injured Fruit Trees

If a tree is badly girdled by mice or rabbits it usually dies if left untreated. If, as soon as the wound is noticed, it is cleaned and covered with grafting wax or some paste, such as sulphur, cowdung and clay, and wrapped with cloth to exclude air and prevent the wood from drying out, there is a possibility of saving the tree if the girdle is a small one, as the sap which rises through the wood will continue to do so, and returning through the inner bark in an elaborated condition will cause growth to be made all around the upper part of the wound, and if the latter be not too large there is a chance of its healing over. If, however, the wood becomes dry before the bandage is put on, the tree will almost certainly die, although it may continue to grow throughout the season.

When the wax and bandage are applied, the tree should be headed back considerably to lessen the amount of transpiration of moisture, as there will not be as much sap rise as if the

tree were uninjured, and the wood will thus dry out sooner than if it were headed back. If the girdle is near the ground, in addition to covering the injured part with wax or cowdung and clay, it is advisable to mound up the soil about the tree to cover the wound and thus help to prevent the wood from drying out. The mound should be up about six inches above the wound and be about two feet across at the base. Bridge grafting may also be used with success.—Experimental Farm Note.

Club Root of Cabbage

Will you kindly give me information about the cause and cure of Club Root in cabbage plants?—W. F., Islington, Ont.

This disease is very troublesome in the Maritime Provinces. As yet it has not become established in Ontario, although cases of it have been found. It attacks radishes, cauliflower, turnips and other vegetables of the same family. It is caused by a slime fungus. Interesting information concerning it is given in Bulletin 258, recently issued by the Ontario Department of Agriculture, entitled "The More Important Fungus and Bacterial Diseases of Vegetables in Ontario."

Affected plants wilt noticeably. On their roots will be found irregular thickenings and swellings sometimes two to three inches in diameter which gives the disease its name. The tops of diseased plants develop very slowly. Cabbage and cauliflower, when attacked, form very little heads, and often the plants die.

When plants develop the disease dig them up, taking care to get all the root, and burn them. When the disease becomes established in a field, a four or five year rotation of crops should be practised so as to avoid growing turnips or cabbages on the same soil for a number of years. Applications of lime every few years will materially lessen the severity of the attacks. Burn all refuse from the diseased crop.

For best results with potatoes, land should be fairly rich. I use 20 tons per acre applied in the fall and plowed down. I have also found that potatoes will pay good profits on commercial fertilizer, provided a large enough application is given to make its effect felt. I found last year that it took at least 600 lbs. of a 2-10 fertilizer per acre to make any appreciable difference in the yield. A thousand pounds, however, increased the yield and resulted in earlier maturity. This works out at only four cents per rod of row and a slight increase in the yield will easily pay for it.—Douglas Maynard, Leamington, Ont.

Combless Packages

Wm. A. Weir, Assistant Apiculturist, Guelph, Ont.

THERE is every indication that the transportation of combless packages will meet with unusual difficulties this year and the beekeeper, whether beginner or experienced, will be called upon to exercise considerable skill and patience to get results from his delayed shipments. Three sizes of packages are being ordered in large numbers by Ontario beekeepers this spring, viz., one, two, and three pound sizes. In order to get the highest production of honey possible, I feel that we ought to regulate our plans so that the package will produce a surplus. A table of strength approximating what follows, should be adopted by the Ontario beekeeper:

Size of Package. Time of Arrival.

One lb. package, April 15th to May 5th.

Two lb. package, May 5th to May 20th.

Three lb. package, May 20th to June 5th.

Where drawn combs are available on which to start packages, the bees delivered during the periods mentioned which receive proper handling, will normally give good results. I would feel very much inclined to unite packages which arrive late, so that they will be strong enough to be productive this year.

In any case it is necessary for the beekeeper to be fully prepared for the reception of his packages. A prepared hive should be packed as for wintering to give the best results. The conservation of heat is the most important feature in the management of package bees. One pound of bees in May will cover only two frames of drawn combs under the most favorable conditions. It is therefore obvious that what we can do to conserve the heat of the brood chamber will be well repaid, and packing certainly conserves the vital heat and enables the cluster to cover the maximum amount of brood.

When selecting drawn comb for the prepared hive, worker combs with a little pollen and honey will meet the need, but where no uncertainty regarding disease exists, a frame of capped worker brood taken from any strong colony in the yard should also be used. If foundation must be drawn out, I would strongly advise the two pound package delivered between April 15th and May 5th, or the three pound package for a later date. Except under very favorable conditions, I do not feel that the one pound package placed on foundation is a paying proposition. Always prepare wired frames with full sheets of brood foundation. I much

prefer the medium brood weights for starting packages.

We place the prepared packed hive containing two frames of worker comb and one frame of sealed honey, or when combs are not available two

frames of foundation, and a tight fitting division board on the stand, ready for the reception of the bees. On receiving notice of shipment, from the shipper, we watch the customs and express offices closely, in order to avoid delay. The majority of first class southern shippers have arrangements at the border for the clearance of all packages shipped to Ontario customers. This has been instrumental in saving much delay.

Immediately on receipt of notice of shipment from the express office, we release packages and the first operation is to feed them. Many packages, even in normal times, are short of stores when they arrive in Ontario, and this difficulty will be more general as a result of the present railway and labor conditions. To feed the packages, we make up a syrup of equal parts of granulated sugar and water. The syrup is painted on the screen of the cage until the bees have gorged themselves. The packages are then set in the cellar for a short time to settle down. Never leave packages sitting in the sun.

Frames containing sealed worker brood are now taken from strong colonies in the apiary and placed in the prepared hive, next to the frame containing sealed stores, and the entrances of the prepared hives are blocked to prevent passage of bees in and out of the hive. The packages are then brought out, and after disor-

Contributions Invited

The most interesting contributions we receive for the Canadian Horticulturist often are those which beekeepers send us on the impulse of the moment and as the spirit moves them. They are always most welcome. Sometimes they cannot be used immediately, but they are published as space permits and the seasonableness of their contents dictate.

Just now we are short of good illustrations. Have you any which you can send us? If so, we would like a few for use in the June issue. Poor ones cannot be used, so send the best you have, especially if they illustrate some special phase or operation in beekeeping. Write your name and address on the back of each photograph, and add any notes about them that you believe will be interesting. This invitation is to you. Let us hear from you.

The Editor, Beekeeper, Peterboro', Ont.



Field Meets are popular among the Beekeepers of Manitoba, as they are in other Provinces. The illustration shows lunch being served on one of these occasions in the apiary of Mac Stanbridge, Stonewall, Man.

ganizing the cluster by severely jarring the cage, we open one side of the cage by taking the screen off, and lay the cage on top or beside the frames in the prepared hive. It is always advisable to feed a newly introduced package, using either a division board feeder, a perforated jar top feeder, or a ten-pound pail feeder. We use the last mentioned feeder because we have them for fall feeding and we think the packages can be fed more easily and with less tendency to rob the cluster of the vital heat so imperative in the management of the package.

Whenever a feeder is used, do not expose the colony any more than is necessary and pack up snugly before leaving. Be very careful in all feeding operations to avoid any possibility of robbing, and where foundation is being drawn out, I would recommend syrup consisting of two parts sugar and one of water in preference to one part of sugar and one of water. Twenty-four hours after the introduction of the package, we give the new colony a very small entrance, not more than one-half inch by seven-eighths inch. The cage is then removed, shaking any adhering bees into the brood chamber. The tight-fitting division board is placed next to the comb and if there is no nectar coming in from natural sources, we feed a half pint of syrup every afternoon until the first good honey flow commences, which us-

ually comes from fruit and dandelion bloom, about May 15th in Ontario. The addition of another frame of brood is not usually advisable, but will have to be a matter of judgment on the part of the beekeeper.

Twenty-one days after the introduction of the package, the expansion of the brood nest should begin to become very rapid, and with judicious handling, a two pound package with a good untested queen, will have developed into a full ten frame colony, by the opening of the clover flow. Whenever a queenless package or drone layer develops, we promptly unite the bees of that package, with a package headed by a good queen. I cannot see how it pays to attempt requeening such a package, unless a surplus of queens is right at hand. Yields from packages handled in this way in 1916 ran from 75 to 120 pounds, in 1917 from 30 to 60 pounds, two fairly representative seasons, so that I feel confident in advancing the method described.

In conclusion let me repeat the three cardinal features in package management: First, the conservation of vital brood chamber heat; second, the supply of stimulant in the form of a drawn comb, pollen, honey and brood; third, the supply of a sufficient number of worker bees to enable the queen to build up a strong colony at the opening of the clover flow.

Treating E.F.B. Without Destroying the Combs

Warrington Scott, Wooler, Ont.

WHILE nearly everything of importance about this subject has been written, and to my knowledge no new developments have taken place within the last two years, it may be a benefit to some to review a few of the ideas.

When European foul brood first broke out in my apiary, eleven years ago, I destroyed a fine lot of super combs that could just as well have been saved had I known as much as I learned a year or two later. My bees were mostly black when the disease broke out, but with black bees all super combs can be saved, but usually all brood combs have to be destroyed or melted into wax. If the bees have been Italianized before the disease reaches them, they can be successfully cured without destroying any combs. There are many different plans of treatment. One is to remove the queen for a period of from five to ten days, thus giving the bees a chance to clean up the combs while the queen is caged. Another plan is to raise the brood combs in a super and put a set of clean combs, or foundation if the flow is real good, in the brood chamber and place a queen ex-

cluder between, thus keeping the queen below. At the time of raising the brood, one comb containing a little unsealed brood should be left below with the queen for five or six days, then placed above and another clean comb put in its place. If the honey flow is on, place a super on the brood chamber as usual, putting the brood on top of the super, and it may be left there and used as a super. All queen cells should be cut out in about eight or ten days after the brood has been raised.

It is unnecessary to disinfect any hives or appliances when treating E.F.B. Where it has been in an apiary for a few years, there will be some colonies that will occasionally become



Mr. W. G. Hornick, of Flinton, Ont., in a corner of his apiary.

affected. These cases will appear in the spring and disappear after the honey flow comes on. If there are cases that do not clear after the honey flow has been on for two or three weeks, they should be requeened, which usually effects a cure.

Much depends on the honey flow when applying any treatment for this disease. If the flow is good and the colony fairly strong, any treatment will work satisfactorily, but when the flow is poor the bees seem to be inactive and allow the dead brood to remain in the combs and decay, and thus help favor the disease; but when the flow is good, the bees are stimulated to good "house cleaning." The Italians will remove the brood soon after it dies, thus preventing the germs developing.

After the disease has been in a locality for a few years, the germs seem to lose their vitality and are not so hard to control as is the case when it first appears. By keeping strong colonies of a good vigorous strain of Italians, European foul brood will interfere but little in producing good crops of honey. At least that has been my experience after having the disease to contend with for eleven years.

A Beginner's Experience

Wm. Barrett, Caledon, Ont.

TAKING advantage of the editor's invitation, I offer the following contribution in the hope that it may help to stimulate and encourage the "other fellow" to stick to his bees and keep his hand to the plough.

Up to the spring of 1916 I had led an active city life for forty years. Then

an opportunity came to exchange it for the country, which I readily seized, as I had always been ambitious to live the open life. Turning my thoughts to how best to earn a living there, I decided on beekeeping—a knowledge of which I had obtained in the Old Country, where I kept a few colonies as a side line, and

incidentally supplied the local grocers with a few hundred pounds of honey. I bought the recognized text-books, having personally taken the short course at Guelph, and then started on my venture with twenty of the best colonies of bees that ever graced an apiary. They were Italians, and when they arrived they had (so I am told, for I was on my back, sick) brood on five and six frames. What was to be done? My wife and I were alone, and she without previous experience or knowledge. She took instructions from me, and with the help of a neighboring farmer, supered them. By the time I could crawl out they were swarming and swarming and still swarming. Not a queen was clipped, and I can honestly say I never worked harder in my life. We hived some, and others absconded. We ran short of supplies, for my sickness stopped all manufacture of appliances. In my despair I hived swarms in boxes, just dumping them in, turning them upside down, and after making provision for entrances, left them alone. In due time came the fruits of our labors. My wife wheeling the heavy supers, capping and extracting, to find at the end we had over 2,000 pounds of the very best white clover honey and 1,000 pounds buckwheat honey. Then we were concerned as to its sale. The wife suggested a sign should be hung in a maple tree in front of the house. Accordingly I printed a sign, "Honey for Sale," on paper, and presto! within four weeks the whole year's output was sold at the door without having to ship a can. By this time my health was im-

proving, and I firmly believe that the many stings that I had during the season went a great way towards that improvement. It may be fancy, but such is my belief.

The Wintering Problem.

Then came the problem of wintering. I had intended to make my own cases for outside wintering, but not feeling equal to the task, bought them ready made, collapsible and otherwise. In taking stock, I found that I had increased to 40 colonies, but only wintered 34, the balance being made up of three queenless hives and three of the swarms that I put in boxes, being too inconvenient to winter. All that winter I was wondering whether I should find a live bee in the spring. It is surprising how one's acquaintances can pop up with their advice and prophecy, but how noticeable is their absence

when a little help would be worth its weight in gold. Yes, one would come and "console" me with the fact that he would bet "they're all frozen"; while yet another's advice on building a "windbreak" would make you weep as to its efficacy. I suspected this fellow was asking for a job, and so on, ad infinitum.

Well, the spring came. Suspense was ended. One colony alone had died, but they were all pretty short of stores, and before I could get them stimulated, two more went the way of the just and unjust. Thus I came out with 31 colonies net.

Last Season.

This season of 1917, with improved health but a hand too shaky to clip the queen's wings, I started out with con-

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Transferring Bees from Boxes to Model Comb Hives

D. Anguish, Lambeth, Ont.

THE expert beekeeper may consider an article on this subject out of order, as he has got past the stage of transferring, and there are so many ways of doing the job, one hardly knows which would be the best for the novice to try his or her hand at. I am going, therefore, to try and describe the old method, that has been in practice for many years, and which seldom fails when carried out by the beekeeper.

The first thing to be done is to adopt the style of hive you intend to use. There are quite a number of different styles of movable frame hives in use.

If you were to ask a supply dealer what kind to adopt, he would be sure to say Langstroth. His reason, probably, would be that it was the only kind of hive or frames he carried in stock. You must, however, decide that part for yourself, as all movable frame hives are all right if made accurately.

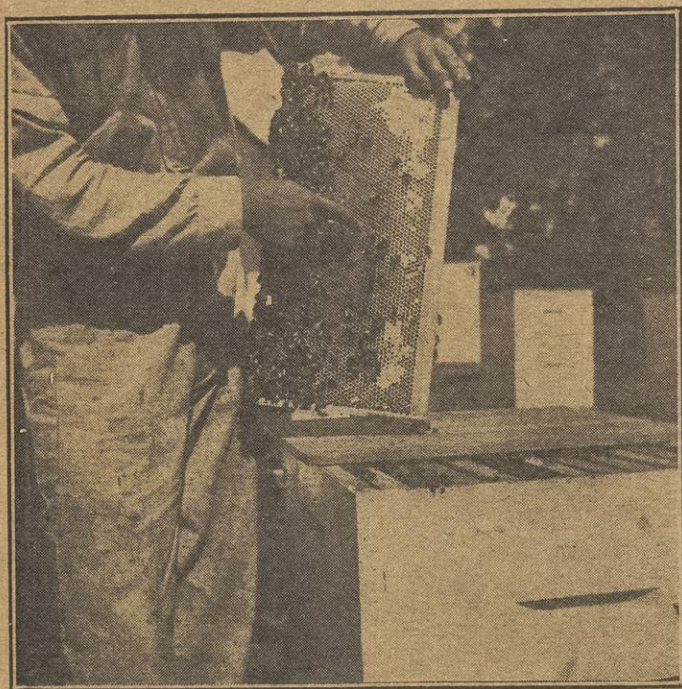
When you have decided on your style of hive, get one for every old box full of bees that you have. Get them nailed together and painted, ready for operation. The best time to do the transferring is when the apple trees are in full bloom, and there is

lots of nectar coming in. Everything is in readiness, then, for operation. Secure a good smoker, and probably you had better have a veil. Get a dark one, as you can see better through a dark one than through any other color. Select a fine, sunny day, when the bees are working nicely on the apple blossoms. Take the hives, smoker, and all the tools necessary out to where your bees are, and have a table or stand ready to do your work on.

Lay a few newspapers on the table. Have some twine ready to tie the brood that is in the combs that you take out of the old boxes. Take four or five pieces of twine, about 24 inches long, lay them on the table, about four inches apart. Have the smoker ready, with a good volume of smoke and not much heat. Go to the old box hive, puff in the entrance a few puffs of smoke, tap the hive a few times with the toe of your shoe, and then wait a few minutes. Repeat the same operation. By that time the bees have gorged themselves with honey. Pick up the old box, carry it over beside the table, and turn it upside down.

Take a saw and cut all around inside to loosen the combs from the box. Then take an old chisel and hammer, and cut off the nails so that the outside will drop off, leaving the combs standing, attached to the top. Take a knife, cut out the combs. Save all that have a worker brood, to be placed in frames. Lay the frame on the strings, fit all worker broods in the frames, and tie the strings around the frame and brood, and place the frames in the

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"There she is," Mr. E. Benoit, Ste. Scholastique, Que., locating the queen. Mr. Benoit has exhibited successfully at the Central Canada Exhibition, Ottawa.

A Beginner's Experience

(Continued from page 125.)

fidence. I tried to control the swarming impulse, but have to acknowledge myself beaten. Whether I raised the brood to the upper chamber too late, or not sufficient at a time, is one of my problems. I kept most rigidly to the weekly examinations and cut the queen cells, all to no purpose, the bees swarmed. I have had them as early as 7.15 a.m., and as late as 5 p.m. Some I doubled up, others I hived. The three swarms of the previous year I transferred according to the plan I read in your April, 1917, number, by Mr. Chrysler. Did that method prevent swarming? Not on your life! From one of those boxes I hived five swarms, and one experience I had will never be forgotten. A swarm had just issued, when the three boxes swarmed simultaneously and all alighted with the first swarm. Talk about bees by the yard. I do not think fifty inches would have covered that swarm. Then the funniest thing happened. I was parting the twigs so as to take the swarm clean when they all took wing and went to their respective hives, only, of course, to issue later. I drummed two of those boxes, and the third. I waited patiently to see it through as claimed by Chrysler's article, but after many examinations, it did not look as though her majesty intended to go "upstairs." At the end of August, one day I was rewarded by catching the queen just on the bottom bar of a frame, so I promptly confined her to the top chamber and left her to it until just before wintering, when I removed the lower box.

The result of my season's work was approximately the same amount of honey as the year before, but with 11 more colonies, and I have put in winter quarters 51 colonies.

Such is my experience in starting in the bee business. I trust that I shall be spared for many years to pursue the occupation. Being only just passed half a century, I have learned the virtue of patience and perseverance more than in any other vocation of life. I cannot conceive an occupation where these two virtues combined with an exactitude for details have to be preached to such a degree.

In conclusion I would say to the beginner: Stick to your bees, keep with them, learn all you can by observation of their habits, read the best works and periodicals, attend demonstrations and conventions, take advantage of membership with the O. B. A. in affiliation with your local association, and if possible, attend the summer course at Guelph. Make a point of calling upon successful beekeepers, observe their methods and select pointers that you think you can successfully imitate, and if you would avoid disappointment, don't rely on the "brotherhood" of the fraternity for practical help—except perhaps at a price. I think if these lines are followed, it will not be long before the bee will keep you instead of you "keeping bees."

Transferring Bees

(Continued from page 125.)

new hive on the old stand. Save all the brood possible. Have the new hive on the old stand as soon as you can and get the frame of brood in so that the field bees will have some place to deposit the nectar.

Keep brushing all the bees you can off the combs you take out of the old hive in front of the new hive. Be very careful about killing bees, as one of them is a queen, and she is very valuable at that time of year. Save

all worker comb by tying it in frames the same as you do with worker brood. Do not put any drone brood in the frames, as there is always plenty. Fill in the balance of the hive with full sheets of foundation. Do not attempt to do any transferring by this method if there is no nectar coming in.

Watch the Sugar Supply

Morley Pettit, Georgetown, Ont.

A point which should be taken up, or at least kept in mind, in case the Canada Food Board finds it necessary to greatly restrict the use of sugar, is the need of sugar for fall feeding. There are two principal reasons why it is important to feed sugar. First, the feeding back of honey carries too much risk of transmitting foul brood. Second, brood chambers often contain honey which granulates and kills the bees in winter. I have seen whole apiaries wiped out from that one cause.

Our bees, as far as we have examined them, have come through in fine shape. One was dead and two queenless out of over a hundred in the home yard. The rest are in splendid condition. We attribute our success in wintering in such a severe winter as the one just past, largely to the fact that we fed sugar heavily in the fall.

Buying Neglected Bees

F. W. L. Sladen, Apiarist, C. E. F. Ottawa.

Patriotism is apt to take strange forms in these days of stress. One of the ways to carry out the motto, "Food will win the War," may be to sell the bees to a neighbor.

Of all the suggestions that have been made for greater honey production this year, none, at this eleventh hour, promises to be more effective than the sale or lease of bees owned by those who have not time to attend to them, or are inexperienced in modern methods of beekeeping, to those who have gained this knowledge or are making an effort to do so, because the man who knows how, is likely to obtain several times more honey per colony than he who leaves the bees alone, or employs old-fashioned methods. The season is so short that any increase of bees by breeding that the beekeeper can make is largely at the expense of the honey crop; he must therefore buy bees in the spring to get an increased return within the year.

Because it takes about two years for a man to learn to become an expert beekeeper, and many own bees without being in a position to give them the attention they need to make them fully profitable, a quicker increase in honey production will in many cases be obtained by a change in ownership than by any attempt to inculcate better methods of management, valuable as this work always is. We do not know exactly how far it will be possible for beekeepers to increase their stock by the purchase of bees without combs from the south. An unfavorable season in the south, and a very heavy demand for such bees, with the entry of many inexperienced shippers into the business, caused more or less disappointment in a good many cases last spring. A further risk this spring is a possibility that a congestion of railway traffic may cause more death and delay in transit than usual. But any beekeeper can go around his neighborhood in the spring and endeavor to buy up bees from those who have lost interest in them, incidentally putting those who do not wish to sell on

the track of how to care better for them, even if it is to do nothing more than to send their names to the Publications Branch of the Department of Agriculture at Ottawa for the supply of free literature on the care of bees.

While bees are now worth somewhat more than usual on account of the high price of honey, colonies in neglected condition will be found that are dear at \$5.00 or even \$3.00 each, others that are good value at \$10.00. By buying in one's immediate neighborhood and perhaps packing and transporting the bees oneself, the spreading of brood diseases to new districts and the loss of bees in transit, as well as high transportation charges, will be avoided.

Opportunities in Honey

It is possible for the American beekeeping industry to be developed so that the honey crop will be ten times what it is at present, says Dr. E. F. Phillips in "A Wasted Sugar Supply," a recent publication of the United States Department of Agriculture. The path to this development, it is said, lies through the education of beekeepers to prevent great wastes that come largely from poor winter housing, two infectious diseases of bees, failure to control swarming, and failure to provide proper room for surplus honey.

"The beekeeping industry," it is stated, "may be the means of conserving a national resource now largely wasted, changing it into nature's own sweet. The raw material is free on every hand; the investment for equipment is small in comparison with other branches of agriculture; the profits are fully commensurate with the study and labor involved. It would seem profitable to stop such a waste of so desirable a supply of sugar. This waste can be prevented only by the education of beekeepers."

Demand For Honey Increased.

The present honey crop of the United States barely exceeds 250,000,000 pounds. That the country produces even this much is unknown to most people, it is stated; for while honey was the chief form of sugar used in ancient times, the ease of getting cane or beet sugar has placed honey in the background. Now that our sugar supply is reduced by reason of supplying the allies with part of the sugar they need, the demand for honey has increased not only domestically but also for export.

Toronto Field Meet

A meeting of the T. B. A. was held in Toronto, Tuesday, April 16th, R. A. Fletcher presiding. It was decided to hold the 24th of May demonstration at the apiary of Wm. Couse, Esq., Streetsville, Ont. We hope to have a record representation of beekeepers.

Reports from the members present representing about two hundred colonies of bees in Toronto, showed a loss of about 20 per cent., owing to the very severe winter, and to a shortage of supplies.

One member had to destroy all his bees and outfit on account of American foul brood.

Some members complained that they had difficulty in getting sugar for spring feeding. President R. A. Fletcher will endeavor to arrange for these supplies.

My three colonies of bees have come through the winter in good order in winter cases.—G. Papworth, Krugerstorf, New Ont.

A New Electric Embedder

W. J. Sheppard, Nelson, B.C.

A NEW type of electric embedder has been made, and is in use here. It is so simple in construction that anyone can make it and at little expense. It does first class work expeditiously, which will be found more satisfactory than if performed with a spur embedder. Only a little practice is necessary to get into the way of using it properly when the wires are firmly embedded and waxed over in the middle of the foundation, greatly adding to its strength and causing it to be less liable to stretch or break down from the weight of the bees, while being built out into comb. All the material required is two 22-inch lengths of single flexible electric lighting

rent, if available, instead of the dry-cell batteries, which might not last long enough without being replenished. In this case it will be necessary to make a rheostat, or transformer, so as to reduce the voltage. The voltage can be sufficiently reduced by passing the current through an ordinary electric flat-iron, but a better way is to pass it through water in a quart glass jar. An Economy or Mason jar answers well. Two perpendicular wires, reaching from top to bottom, are fixed inside the jar so that they cannot touch each other. The connections with the embedder are made at the top of these wires. The jar is filled with water to which a little salt is added, perhaps as much as half a teaspoonful, which will be found to bring the current up to the strength required to do the work. City current will be found more regular than the dry-cell batteries, which are gradually getting weaker all the time they are being used. The strength of the current should not be great enough to make the wires too hot, and is regulated by the amount of salt, which should be added to the water a little at a time until it is found to be just right.

Practical Suggestions by an Old Beekeeper

R. F. Whiteside, Little Britain, Ont.

Editor, The Beekeeper.—After reading Mr. Atkin's article published some time since, on the Wax Extractors, I wrote him thus:—Re your plain and minute description of the Sibbald Wax Press and how you operate it. As to the German press I think it is more intricate, more expensive and less efficient. However, it could be improved upon so as to work nearly as thoroughly as the Sibbald, but, of course, much slower and more tedious. This could be effected by adding two (disc) followers equivalent to the two centre ones in the Sibbald press, thus pressing three thin cheeses instead of one (thick) cheese at a time. You have not mentioned Sladen's new 1916 Bulletin No. 26, "Bees and How to Keep Them," containing a diagram of the Sibbald press and accoutrements, price \$9.00, with full directions for operating. This and all bulletins, of course, are free for the asking from the Department of Agriculture, Ottawa.

Regarding the slatted board followers with screen on both sides, these sometimes get full of dirt, and wax so rendered is no better than that rendered with a plain inch board. However, this can be remedied by plowing out those boards $\frac{1}{4}$ -in. x $\frac{1}{4}$ -in. on both sides, allowing for their swelling when first used, or $\frac{1}{4}$ x $\frac{1}{4}$ or $\frac{3}{8}$ x $\frac{3}{8}$ slats, can be nailed to $\frac{1}{2}$ -inch boards (crosswise or angling) on one or both sides as the case may be.

Regarding followers being made an inch smaller than the wax can all round, I find the cheeses get pressed down into this space and are liable to burst. One-eighth of an inch all round is better.

Your quart dipper seems rather small. A strong three quart one is more expeditious. Don't you use a hook or have the other end of the poker hooked to lift the pot followers out of the wax can? If cloths are left till all is stone cold they stick to the slumgum and followers. Holterman uses bags and they are handier than folding cloths and no assistance is required if two hooks are fixed to the top of the wax can.

Regarding gas for rendering. This is new to me. Of course, a hot air blast would melt them as this is used in smelting ore. However, I have often proved exhaust

steam under control from a 3 h.p. chopping mill engine to be ideal, thorough and cheap. When I see this steam from day to day wasting its energy on the cold desert air it grieves me to the core. However, a condenser would deprive me of this pet ideal. The grain elevator is only two miles away with the same sad waste of hot steam that might be used for heating the office and both elevators all winter. I think one could easily attach an inch pipe to the exhaust of a threshing engine and having all things in readiness could melt all his old combs the same day the beekeeper or his neighbor threshed.

Regarding double fireplaces built on purpose. Why not use two old wash boilers side by side on the summer kitchen stove or the old cook stove in the bee house? Many such stoves would accommodate three boilers, so one could work cold, rainy or windy days if the house was bee tight, but look out if your den has very old shingles on it, or you have no water when wax catches fire. The follower with the iron support is put on first (last you mean). You don't mention melting the old hard, black, tough combs out of the frames in one of your boilers or by steam. It's no fun cutting these combs out of frames, splitting and breaking them and the old knife blistering your hands, digging the wax out of the groove, etc. In handling the hot pail don't forget the mitts next time.

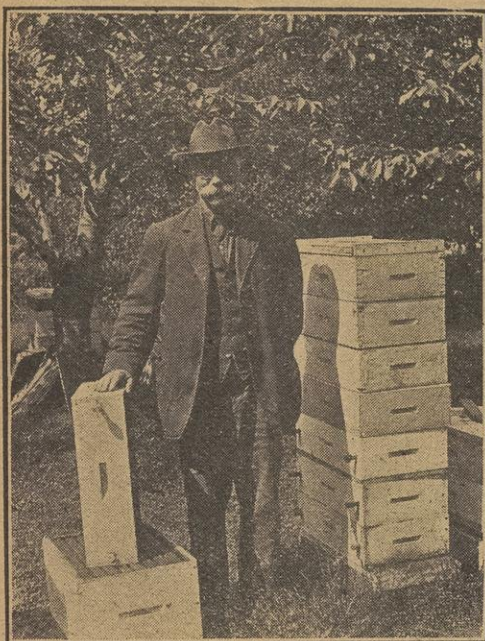
Make sure the follower is square. Well, how could it be otherwise, lying on the bottom of the can? Making sure to get followers square and level never occurs to me. Three quart dippers full of melted comb to each cheese seems small. I usually put in 5 or 6 three-quart dippers full to a cheese, and they come out from $\frac{3}{8}$ to $\frac{1}{2}$ -inch thick and dry and hot as cayenne pepper under that cheese factory screw. Even at this speed I am ashamed of my small day's output compared to our champion operators with four or five hundred to their credit instead of only one or less. The form with the iron support comes on top at the last. I usually have two boilers full at a pressing, and for want of a third one I pour a teakettle full of boiling water on the followers. This water out of the press can, if clean, be used again. If spleeny cooks only saw this clean water they would require to be tolerably thirsty to drink it hot for tea or cold between meals. Some might even object to eating comb foundation honey from this wax, or to be very very nice they might even object to extracted honey coming in contact with such a base.

When two or three pails are drawn off, if you use a couple of paddles at the end you can just whack the cold water right on letting it pour out of the wax spout. This is wrapped around with three or four bags or woollen blankets. I use tin sap buckets with board lids and tier them up three and four deep and find no difficulty in dumping out the wax next morning, but for nice cakes use bright tin vessels. I also use a boy's (hunter's) axe, as it is too hard work scraping the bottom of the cakes.

An Outfit For the Beginner

Extracted honey production is the most satisfactory for beginners. Start with three colonies and sufficient equipment and then make the bees pay their way. One colony does not give the beginner an opportunity to right mistakes or accidents profitably. Three colonies can be managed by devoting one evening weekly to the apiary.

Avoid many troublesome pitfalls by starting with the right hive. The 10-frame Langstroth hive has given the best satis-



Mr. E. Marlow, of Grimsby East, Ont., combines bees with fruit growing. He has some 80 hives for which the orchard provides shade in hot weather, the bees reciprocating by fertilizing the blossoms.

wire and two pieces of stout insulated wire, such as is used for outside wiring, about seven inches long, which are for holding in the hands. A small loop is made at one end of each of the two flexible wires, so that they can be attached to two dry-cell batteries. The other is joined to one end of the stouter insulated wire, which has had a loop made for the purpose. The other ends of the latter are stripped of the insulating material for about three-quarters of an inch, and are flattened with a hammer, or filed, to a chisel point. All is then ready for use, after attachment to two dry-cell batteries.

The frame, already wired and filled with foundation, is laid on the board ordinarily used for the spur embedder. Commence at one end of each wire to be embedded and hold the two points against it, a few inches apart. As soon as the wire becomes heated and melts the wax, lift the point off at one end, so as to break the circuit, pressing the wire into the middle of the foundation at the other, and holding it in this position until the melted wax has set, which is almost instantaneous. Then start off again. The length of wire that can be embedded at one operation depends on the strength of the current and also on the tightness of the wires. The wires should be as tight as possible.

If there is much embedding to be done, it may be advisable to use city lighting cur-

How the Y.M.C.A. Contributes to Victory



Serving coffee 100 yards from German lines near Lens.

YPRES, Langemark, Festubert, Vimy Ridge, Paschendale—how the very names thrill! They stand for deeds of the bravest of the brave—our own Canadian lads! They fight and win, not always by strength of numbers, but by unbeatable fighting spirit, or “morale”

Y.M.C.A. **Red Triangle Fund**

\$2,250,000, May 7, 8, 9

Canada-Wide Appeal

Said a British Staff officer: “I have known morale to be found in a cup of hot coffee. I have seen it sustained by a man's merely writing a letter home. If you want an easy and short definition of “morale” you will find a good one in the four letters Y.M.C.A.”

The staff officer pointed to the men trooping into the big Y.M.C.A. hut and continued: “Those men are going to the front line tomorrow. In the Y.M.C.A. some of them will be playing games, others attending divine service, but each in his own way will find a strengthening of his ‘morale’ in the comradeship of his fellows under the Red Triangle. All this is a thing which is going to turn the balance in our favor.”

Through the hell of battle after battle, our brave soldiers fight. Through fire, water, mud, filth and deadly danger follows the ever-faithful Y.M.C.A. man, even if he can bring but a bucket of invigorating coffee to fagged fighters. Will you help us to supply the coffee—and to render the thousand and one similar services to soldiers everywhere?

The Y.M.C.A. needs at least \$2,250,000 to meet the tremendous demands. Be generous!

Bits from Soldiers Letters

“The Hut is very well termed ‘next to home’”.

“I went home for the first time in 18 years and I had not written for 13 years. I have given up my old habits of drinking and gambling and thank God for it. Thanks to a little word caught at one of your good night services”.

“From one end the train to the other I heard nothing but good of the “Y”. Your representative did his best to supply our needs, purchasing stuff at rock bottom prices and letting the boys have it in the same way”.

“They send guides out with parties of soldiers on sight-seeing tours all over London.”

A German prisoner said; “The reason you fellows show such fight is easily understood. Your officers’ canteens, Y.M.C.A.’s and padres are backing you up.”

“Who pays? I don’t know. But whoever they are, God Bless them. They are the fathers of thousands of boys”.

“Earn and Give” Campaign for Boys

Serve your Country by your labor and make a gift to the Red Triangle Fund from your earnings! What a fine chance to do a double service! Six thousand boys are asked to give \$10 each. Of the total, \$50,000 goes to help the soldiers, the balance for boys’ work. Gifts must be at least \$10, the standard unit. A boy may subscribe more than \$10 in \$10 units, but not less. A beautifully engraved certificate will be given to each subscriber. Ask your local Y.M.C.A. representative for pledge card and full information.

National Council, Young Men’s Christian Association

Headquarters: 120 Bay Street, Toronto

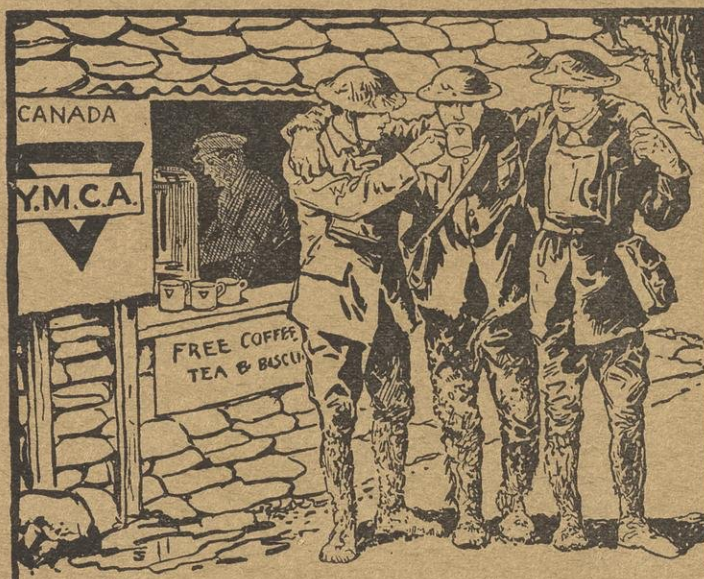
John W. Ross, (Montreal)

National Chairman of
Red Triangle Fund Campaign

G. A. Warburton, (Toronto)

National Director of
Red Triangle Fund Campaign

"What Would We Boys Do Without the Y.M.C.A.?"



Y.M.C.A. men helping wounded soldier.

READ this soldier's letter: "Right up close was a Y.M.C.A. outfit in the side of the bank near the trench where the wounded were carried out. They, like myself, wet and suffering with the cold, the poor mutilated devils with the pangs of thirst added to those of cold and agony—to suddenly come upon a hot cup of tea, cocoa or coffee with fine cakes and bread and butter, all with a smile for the asking, without stint. My memory is that I would have paid ten dollars for the cup of coffee handed to me. If only every charity were as practical!"

Y.M.C.A. Red Triangle Fund

\$2,250,000, May 7, 8, 9

Canada-Wide Appeal

Think of the dangers that beset the soldier in health—the temptations of camp and city, the long days and nights in billets when dread homesickness overtakes him. Everywhere he goes your soldier boy is helped by the Y.M.C.A. Cheerful huts welcome him with companionship, games, sing songs, concerts, refreshment and a word of guidance.

For this far-reaching work across two continents the Canadian Y.M.C.A. needs at least \$2,250,000. Be generous!

National Council, Young Men's Christian Association

Headquarters: 120 Bay Street, Toronto

John W. Ross, (Montreal)

National Chairman of
Red Triangle Fund Campaign

G. A. Warburton, (Toronto)

National Director of
Red Triangle Fund Campaign

Tributes:

Lord Northcliffe:

"I do not think the war can be fought without the Y.M.C.A."

Major-General Bursall:

"The benefit to the troops is beyond calculation."

Lt.-Colonel Mayes:

"Games have a tendency to increase fighting spirit. Any efforts on your part to expedite delivery of athletic equipment will be of national service."

Major-General Leckie:

"One cannot speak too highly of the excellent work of the Y.M.C.A. at the Front."

Harry Lauder:

"We took the responsibility of sending these boys to defend us, and we must not fail them. The Y.M.C.A. huts are the soldiers 'Home from home'."

General Alderson:

"Your work is very much appreciated by all units of the corps."

Hon. R. B. Reese, Australia:

"The greatest praise must be given to the Y.M.C.A. who succor the men even right up at the front line."

Brig. Gen. Odum:

"I want to let you know how much I was impressed with the work done by the Y.M.C.A. It was simply magnificent. All ranks are enthusiastic. I have recommended one of your officers for the Military Cross. The Y.M.C.A. has endeared itself to the soldier in France as no other institution has."

faction in Ontario. All beekeepers' supply houses carry this hive and its parts in their regular stock. Buy your first hives from a good manufacturer. It is very necessary to have all hive parts interchangeable so that they may be used in any colony in the apiary. Uniformity and accurate workmanship alone can ensure this need.

One complete 10-frame Langstroth hive consists of:—

- (1) A bottomboard;
- (2) A Hive-body with self-spacing frames and wire;
- (3) A telescoping metal roof cover.

In addition the beginner should provide for each colony one queen excluder; two extra hive-bodies complete with frames; and 7 lbs. of Medium Brood Foundation, which runs six sheets to the lb., to fill the frames with a guide and foundation for the future combs. All hive material should be nailed, wired and painted before the opening of the spring rush.

It is advisable to commence with a 2-lb. package of bees and queen; a swarm or a nucleus. Less danger from disease attends the buying of pound packages than the buying of swarms and nuclei. Pound packages may be secured for delivery from May 1st to June 30th. Early packages will yield a surplus if carefully handled. Enquire of the Provincial Apiarist re disease in your locality before buying swarms, nuclei or colonies. A small colony of bees is much less vindictive than a full colony and thus offers a better opportunity for the beginner to grow with his bees.

The accessory equipment for the beginner should consist of:—

- (1) A veil of black cotton tulle.
- (2) A standard bee smocker.
- (3) A hive tool.
- (4) A spur wheel wire embedder.
- (5) An uncapping box.
- (5) An uncapping knife.
- (7) A complete set of Department literature, Bulletins 213, 233 and 256, and a good reference bee book.
- (8) A small honey extractor.

With the exception of Nos. 6 and 8, it is advisable to acquire the material needed from a supply firm at once. The uncapping box can be made at home, and the beginner could probably co-operate with another beekeeper in securing the use of an extractor. With the increase of colonies to ten, it would then be advisable to provide a storage can to assist in handling the crop.—W. A. Weir, O. A. College.

Suggestions for Inexperienced Beekeepers

By G. Guyer of Port Hammond, B.C.

As the bee-keeping industry in this province is waking up, I think a few words of encouragement to the beginner would not be amiss.

In the first place, I would advise a beginner to buy bees in his own locality, if possible, and not start with more than two strong colonies. The best time to start is from the 15th to the 25th of May, as by that time all danger of spring dwindling is over and they will, as a rule, give a return for the capital invested during the following summer.

A beginner's outfit is a good smoker, an A.B.C. in bee culture, a good bee journal, an extra hive and super for each colony spring count.

In the early spring when the bees are flying freely examine each colony to see that it has a laying queen and plenty of stores. Remove all drone comb except a little in one outside frame and replace with worker comb or foundation. Two drones cost as much to raise as three workers, and after they are raised they keep on eating, while the workers labor for you.

Springtime is the most dangerous time for bees to starve, watch your colonies and feed the destitute ones until the honey season opens. If you have to feed, don't feed with a dish or anything that would create robbing. If you have only a few colonies, and they are a mile away from your nearest beekeeper, you can use the Guyer system, and if your bees have a young queen from last year, if she is any good at all, you can have your hives boiling over with young bees when fruit bloom comes; then you must discontinue the artificial pollen and the syrup.

The Guyer system is to feed eight rods from the apiary, but you must have the Guyer open-air feeder—it takes one to every two colonies. It is nature and the bees will build up 50 per cent. faster than any other method ever invented. Be sure and do not scatter any sweets around the yard amongst the hives. Keep your entrance well contracted early in spring, especially if they are inclined to be weak, and keep them nice and warm. Do not take any top covering off until your bees are fairly well built up, but enlarge the entrance by degrees, as they get stronger, and take the top covering off gradually as the weather warms up.

The Government Should Help

D. Anguish, Lambeth, Ont.

It is up to the honey bees to produce all the sweets possible, as the sugar situation is getting to be quite a problem. In a great many countries the people are allowed only a very small amount in order that every one may get a little.

I see by the papers that the Dominion Government is urging the farmers to grow more sugar beets. They promise to assist by buying factories, and letting the farmers have them at cost. In a great many other ways the farmer is promised help. I have failed, so far, to see, however, that the Government has offered to assist the bee industry very much. I suppose the reason is that many people class honey as a luxury, especially those who have the running of the affairs of our country. It is not so on the other side of the line. As soon as they declared war, the United States Government advised the beekeepers to produce all the honey they could, and promised to assist in any way possible, as something had to be done to help out the sugar shortage. Why should not our Government do the same?

The B.C. Beekeepers' Association

We are entering the third year as an incorporated association, and have the support of the Department of Agriculture of this province. For members' use there is a small library of apicultural books, and the public, as well as members, are invited to visit the Experimental Apiary at Vancouver Exhibition, Hastings Park, Vancouver, during the coming spring and summer months, for the purpose of receiving instruction in practical bee-keeping.

Ranchers with a very few acres, orchardists with even a small orchard, city people living in the suburbs, can all augment their returns of crops and incomes by keeping bees and giving proper attention and care. The first step in keeping bees is to associate yourself with bee lovers, then purchase one colony of bees, and from that build up your future apiary—that is the only way.

W. J. Sheppard, of Nelson, B. C., is honorary secretary-treasurer of the Kootenay Beekeepers' Association.

The Lower Mainland is covered by this association, and Vancouver Island beekeepers will shortly be organized as a branch, so that the whole province will be organized. By organization we shall have better results from our better-kept bees. Field days for those who need them; exhibits at local fairs worthy of the craft, and prizes that will fitly reward those whose industry has been devoted to the subjects exhibited.

The Beekeepers' Association has adopted a standard for 10-frame hives; it is the same as the Ontario size. We would urge those commencing to be sure and ask "Are the bees in an eight or ten-frame standard Langstroth hive?" when buying bees. When I came from Ontario, I wrote a man for a colony of bees, naturally expecting them to be in a hive of the same class and size I had been used to in Ontario, but imagine my surprise when I received a Jumbo hive, with no stores, and a very old queen. I did not object to the six pints of syrup I gave the bees, as it was March, because it was a cheap experience.

In regard to time when to start some suggest April for the Kootenay, while others advise starting from the 15th to the 25th of May. This date when applied to the Lower Mainland, in my opinion, is not early enough.

Bees in Keen Demand

There are many more demands for colonies of bees in Manitoba than can be satisfied by the supply of purchasable colonies in sight. This sums up the bee situation in Manitoba, as stated by Mr. R. M. Muckle, the provincial apiarist.

Mr. Muckle estimates the present number of beekeepers in Manitoba at 900, and each year adds about 100 beginners to the number. Last year, through his office, enquirers were directed to sources of supply to such an extent that 147 colonies were known to be bought by beginners, and even thus early in the season demands have been listed for 140 colonies, mostly in orders of one or two hives for each person.

In addition to the demand for whole colonies, there has grown up a demand for bees by the package. Already one beekeeper has placed his order in the south for 100 two-pound packages.

The high prices of honey, together with the sugar scarcity, are just now helping to popularize beekeeping, which, however, has for a few years been coming into its own anyway.—The Manitoba Horticulturist.

It is unfortunate that our Dominion Government does not recommend beekeeping more than it does. It puts much stress on the growing of beets for sugar, which require a great deal of labor before they can be converted into sugar. The Government does not seem to recognize that there are millions of tons of nectar going to waste just because of the lack of bees to gather it. Possibly we beekeepers are to blame for not calling the matter to the Government's attention more earnestly.—D. Anguish, Lambeth, Ont.

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Your orders would be appreciated.

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Niagara District Notes

By F. G. H. Pattison, Winona, Ont.

THE past month has in many respects been favorable to the fruitgrowers. There has been but little severe weather and late frosts appear to have done no damage. The spring is earlier than usual and the ground is working up exceptionally well. Fruitgrowers, generally speaking, are well up with their pruning and other winter work. The ground having dried off earlier than usual, a good deal of spraying with lime-sulphur has been done, especially on peach trees and early plums.

The amount of injury done by the late abnormally severe winter is by no means yet certain, but there appears to be a fairly good prospect for a crop of peaches, although in some localities a good deal of damage has been done to the buds of the more tender varieties. Japanese plums have suffered badly, and in some places, Governor Wood, Elkhorn and Black Tartarian sweet cherries have been severely injured, but Yellow Spanish and Windsor seem to have escaped. Niagara grapes, too, have been badly winter killed in some localities, but Concords seem to be all right. During the last week of March a special meeting of fruitgrowers was held in the public hall at Winona, at which there was a large attendance. C. C. Pettit, of Winona, was in the chair. The following resolutions were passed:

1. Approving of the scheme of President Kelly, of the Hamilton Board of Trade, as to the manufacturers releasing skilled farm labor from the factories for work on fruit and grain farms.
2. Strongly disapproving of the proposed Daylight Saving Bill, on the grounds that, owing to the heavy dews in the morning dur-

Improved Peerless Plant Boxes

With Round Cornered Rims



The outside rim or band is unscored at the corners thus greatly strengthening the box and eliminating a very large percentage of the breakage hitherto experienced. The Round Corners do not interfere with the arrangement of plants in the box.

OUR MOTTO:

"Every Box a Trade Winner"

Order early from

Canada Wood Products Co.
St. Thomas, Ont.

A Garden of Flowers & Vegetables

Every home should assist in food production this year by planting a vegetable garden. There is no reason, however, why it should not be made beautiful and attractive by the addition of some flowers.

Here are two splendid collections of seeds, one of vegetables just suited for the home garden, and the other of sweet peas—the sweetest flower in the garden.

HOME COLLECTION OF VEGETABLE SEEDS for \$1.00

Consisting of one packet each of the following:

Beans—Sutton's Masterpiece
Beans—Ferguson's Sure Crop.
Beets—Ferguson's Imp. Dark.
Carrot—Ferguson's Early Market Red.
Corn—Ferguson's Early Malcolm.
Corn—Golden Bantam.
Cucumber—Davis' Perfect.
Lettuce—Ferguson's Peerless.
Lettuce—May King.

Onion—Ferguson's Red Globe.
Parsley—Ferguson's Perfection.
Peas—Gradus.
Radish—Long White Icicle.
Radish—Scarlet Globe.
Spinach—New Zealand.
Swiss Chard—Giant Luculus.
Tomato—Ferguson's O. K.
Turnips—Early Stone.

1918 EXPOSITION COLLECTION OF SWEET PEAS

Fourteen of the finest giant Exhibition sorts in one grand collection, \$1.25, postpaid

Primrose Spencer.—Fine deep cream.
Blanche Ferry Extra Select.—Red and white.
Rosabella.—Best rose colored.
Edward Cowdy.—Best orange-scarlet.
Illuminator.—Beautiful salmon orange.
King Edward Spencer.—Best red.
King White.—Best white.
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Margaret Atlee.—Giant rosy pink on cream.
New Mirlam Beaver.—1916 novelty and best light cream pink.
King Manoel.—Largest deep maroon.
R. F. Felton.—Best lavender.
Royal Purple.—Best purple.
Wedgewood.—Best blue.

Order your collection now. Both collections are sent prepaid anywhere in Canada.
Our 1918 Spring Catalogue sent on request.

DUPUY & FERGUSON

38 JACQUES CARTIER SQUARE

MONTREAL, QUE.



GRAY CAUCASIANS

Early breeders, great honey gatherers, cap beautifully white, great comb builders, very prolific, gentle, hardy, good winterers. Untested \$1.25, select untested \$1.50, tested \$1.75, select tested \$2.25.

H. W. FULMER

POINT PLEASANT

P.A.

FOR SALE

A few colonies of Italians with tested queen, \$12.00 per colony; with choice breeding queen, \$17.00.

Untested Queens, after June 25th, \$1.00 each.

Breeding Queens, \$5.00.

Tested breeders, \$10.00.

JOHN A. McKINNON

Box 79, : ST. EUGENE, Ontario
Canadian Queen Breeder.

Three Banded and Golden Italian Queens

Untested—\$1.00 each; 6 for \$5.00; 12 for \$9.00.

Selected untested—1 for \$1.25; 6 for \$7.00; 12 for \$14.00.

Send for Price List. Cash with Order.

W. R. STIRLING

Queen Breeder

RIDGETOWN, ONT.

ing summer and fall, the putting forward of the clock one hour would tend to lessen the production of both farmers and fruit growers, and cause trouble with their hired help.

3. Agreeing to join with Grimsby and St. Catharines in sending a strong deputation to Ottawa from the Niagara Peninsula Fruitgrowers' Association to oppose the proposed prohibition of the manufacture and sale of native wines.

A report from Toronto says that one of the anomalies of the wholesale fruit and vegetable market there is the good demand that exists for all imported lines, while those of home origin are practically neglected. The reason given for this is that Canadian people have at present more money than they ever had before, and so inferior or common grades of fruits and vegetables possess little attraction for them. In consequence of this, the loss of wholesalers in Toronto in Canadian onions, carrots, and the cheaper grades of apples is certain to be heavy. One firm will lose a small fortune in apples alone.

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OF EVERY DESCRIPTION

Root goods made in Canada. Beeswax made into foundation. The highest price paid for beeswax. Bees in combless packages. Get our Canadian price list.

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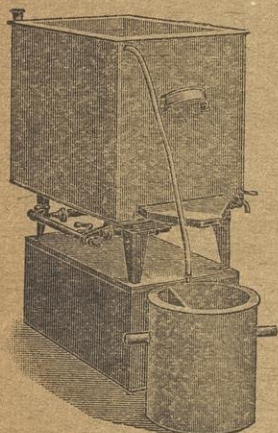
73 JARVIS ST., TORONTO, ONT.

At the annual meeting of the Dominion Canners, held the last week of March at the head office in Hamilton, President Nairn made the following statement: "Our stocks of canned goods on hand are unusually light, and we will probably go into next season with little or nothing in the shape of canned goods." The company is already making contracts with the growers, with the idea of securing an adequate supply of produce. It realizes that a full pack is urgently needed. The American market is pretty well cleaned up, while in Canada there may be some stocks in retailers' hands, but the original holders are practically without stocks, and the supply in all hands is no more than sufficient to carry over till the new pack is available. The assurance that

Fruit Notes From Montreal

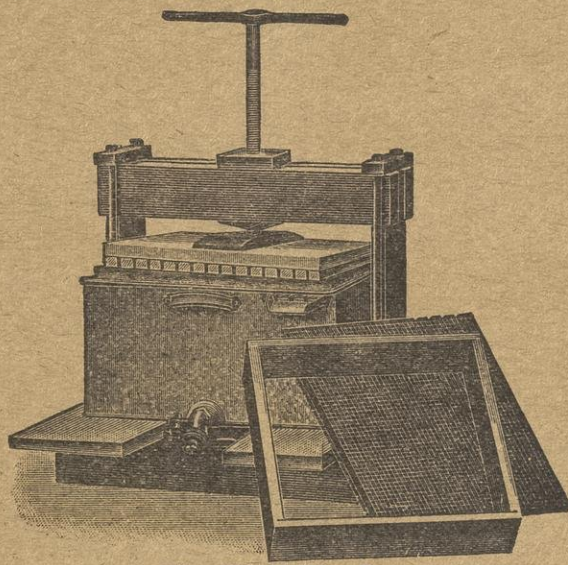
E. H. Wartman, Dominion Fruit Inspector.

OUR strawberry season, in car lots, commenced on March 27th, two days earlier than last year. From Tennessee, only five cars have arrived so far. After the first four cars, there was quite a space elapsed, up to April 5th, when a car arrived from Alabama, the first I ever knew to arrive from this State. This car has been the talk of our city dealers ever since. It arrived after 15 days in transit. If this car had been auctioned on track on arrival, without being seen or inspected, I would imagine one cent per quart would have been the highest bid. But to the surprise of all, when opened they were largely in perfect condition, and quite a percentage of the car was sold at 45c per quart box in a wholesale way, 10 to 20 crates, 24 quarts to crate. The market was bare, and from the fact that its arrival was expected every day, it kept other dealers from dropping in a car that would clash with this one. A few crates were still on hand three days after arrival, making 18 days from the vines, selling then up to 20c a quart, making the most wonderful net profit sale on record at this port. I am persuaded the long keeping of this lot was due, first, to the kind of berry, and 2nd, to the even temperature it was kept at, which was exactly right. The

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Two machines that every up-to-date beekeeper should possess. Beeswax wanted for cash or in exchange, or we will make it into Comb Foundation by Weed Patent Process for you. Early cash order discounts and prompt service NOW.



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PRACTICAL QUEEN REARING

is the title of the new bee book, cloth bound, 110 pages, finely illustrated, which has just been written by Mr. Frank C. Pellett, former State Apiarist of Iowa and well known bee-keeping writer.

For many years there has been a demand for a book which would give in concise form the many different methods of queen rearing, as the Doolittle, Pratt, Alley, Miller, Dines and others with variations as practised by the large queen breeders.

You have this in this new bee book.

Send for your copy now and learn for yourself how to rear queens from your best colonies to advantage. Variations of plans may be of great value also to queen breeders.

Price postpaid, \$1.00, or with the American Bee Journal, one year only, \$1.75.

(Canadian postage 15 cents extra.)

AMERICAN BEE JOURNAL
HAMILTON, ILLINOIS

Annual Festival of Tulips

May 10-11-12, 1918

Visit the Flower City of Ontario on these dates, and see the finest collection of early Tulips in Canada. Spring flower display in the J. H. Gould building, May 10th and 11th. Tulip Sunday, May 12th.

For further information write

St. Thomas Horticultural Society

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NORTH CAROLINA BRED ITALIAN QUEENS

of Dr. C. C. Miller strain of pure three band Italian bees. Gentle and great honey gatherers. Ready May 1st.

Untested, \$1.00 each; \$10.00 per doz.
Tested, \$1.50 ea.; Selected Tested, \$2.00 ea.
Safe arrival and satisfaction guaranteed.

L. PARKER,
R.F.D. No. 2, Benson, N.C.

MOTT'S NORTHERN BRED ITALIAN QUEENS

have proved for the last 11 years to the Canadian friends to be the best of E.F.B. resisters. Hardy, hustlers and gentle.

Sel. tested, \$1.50; Unt., \$1.00; 6, \$5.00;
12, \$9.00.

Plans "How to Introduce Queens and Increase," 25c. Lists free.

E. E. MOTT - Glenwood, Mich.

Standards for Judging Vegetables

The following standards for judging vegetables were prepared by a special committee of the Manitoba Horticultural Association composed of W. T. Macoun, Dominion Horticulturist, Ottawa; S. R. Henderson, and Prof. F. W. Broderick, Winnipeg, and were adopted at the recent annual convention of the association, held in Winnipeg, for one year, when amendments may be made.

Asparagus.

Shoots should be thick, of medium length (8" to 9") and uniform in thickness, tender, and free from rust and insect pests. Long shoots are liable to be woody and tough.

Beans.

Broad Beans: Straight, broad, well-formed pods filled with large tender beans. Free from disease.

String Beans: Pods should be long, straight, moderately broad, tender, and free from disease. Pods should be uniform. Color according to variety.

Beets.

Long: Should be medium in size, smooth and free from side roots, gradually tapering from crown to tip, and firm in texture. Cross-section cuttings should show fine dark red, tender flesh, free from white lines. Top small and compact. Roots should be uniform.

Round: Medium in size, firm, with smooth round shape gradually tapering to a fine terminal root. Flesh should be tender, firm, fine, and of a dark red color. Roots should be uniform.

Cabbage.

Early: Generally round or heart shaped. The head should have fair size, be heavy, firm, hard, and free from insect injury or disease.

Late: Heads round or slightly flattened in shape, with a dense formation of dark green outer leaves, and inside leaves of a cream color. Specimens should be heavy and have firm texture.

Red: Slightly conical or round in shape. Dark red in color. Texture firm and solid, with good weight.

Crop Feeding and Canadian Harvests

YOU are starting off the young crops. Their growth and yield depend upon how well you have prepared the soil and how much suitable plant-food the crops have at their disposal.

¶ Fertilizing paid in tests made on Dominion Experimental Farms in 1915, as follows:

Treatment of Potatoes per acre	Yield bus. per Acre
No added plantfood	75.66
Manure 15 tons plus 583½ lbs. high grade complete fertilizer	200.33
838 lbs. of fertilizer containing Nitrogen and Phosphoric Acid	140.75
Manure 15 tons only	131.61
Manure 7½ tons only	94.36

Write for our publications on greater crop production

Soil and Crop Improvement Bureau of the Canadian Fertilizer Association

1111 Temple Bldg. Toronto

10



SMALL FRUITS

Raspberries, Gooseberries, Red Currants, Black Currants, Strawberries, Rhubarb Roots, etc., etc.

WM. FLEMING
NURSERYMAN
Owen Sound, Ontario

SKINNER
SYSTEM OF IRRIGATION
Control complete. Prevents drought losses. Reduces labor bills. Increases profit. Special Portable Line for \$16.75. Send for new Bulletin.
The Skinner Irrigation Co.
217 Water Street Troy, Ohio.

Don't be too late—

The time for getting your supplies is NOW.

Freight deliveries were never so slow—so we repeat: Don't delay ordering.

We manufacture all kinds of Beekeepers' Supplies.

Hives—frames—tinned wire—DADANT'S and Canadian foundation—smokers—feeders—extractors, etc.

THE TILLSON COMPANY LIMITED
"Everything for the Bees"
TILLSONBURG, ONTARIO

The Fruit & Produce Market

The Commission firms undertook with consignments of fruit and general produce. They will be pleased to have you write them for information, shipping stamps, etc., if you have fruit or vegetables for sale.

STRONACH & SONS

33 Church St., Toronto, Ont.

Wholesale Fruit, Produce and Commission Merchants.

H. J. ASH

44-46 Church St. - Toronto, Ont.

CONSIGNMENTS OF FRUIT & VEGETABLES SOLICITED

We give personal, consistent and reliable attention to every consignment. Shipping stamps furnished on request.

DAWSON-ELLIOTT Co.

32 West Market St., Toronto, Ont.

Wholesale Fruit and Produce. Consignments Solicited.

HERBERT PETERS

88 Front St. E., Toronto, Ont.

Wholesale Fruit and Produce

See advertisement on page x.

Savoy: Round, and slightly flattened. Leaves close and compact, of a dark green color with a fine curl—good weight.

Carrots.

Long: Roots should be long, straight and smooth, without any green at the crown; have a small compact top, be free from side roots, and gradually taper from crown to tip. Texture, tender and crisp. Heart, small with a large outer ring. Roots should be uniform.

Medium: Medium length, straight, free from side roots and gradually tapering to a blunt tip. Skin smooth. Cross-sections should show a small core and a large outer ring. Flesh should be tender and have a rich flavor. Roots should be uniform.

Cauliflower.

Head, large in size with a dense formation of flower, pure white in color and without small leaves in the head. Shape, round horizontally, with a nice, even, curving crown. Cauliflower should be exhibited with a few of the lower leaves attached.

Citron.

Large, well-rounded, heavy specimens, finely mottled and well-colored throughout.

Celery.

Bunch, composed of several long, well-bleached stems of medium diameter, free from rust and rot, with a crisp texture, and rich nutty flavor. Leaves, straight and even. Heart large.

Corn.

Sweet: Cobs should have fair size and be well developed, with straight, even rows, well filled out at base and tassel end. The kernels should be tender, juicy and sweet. Ears should be uniform.


Cucumbers.

Indoor: Should be long, smooth, with size well carried out towards the ends. Dark green in color, heavy.

Outdoor: Specimens should be smooth in form, straight, of medium length, with thickness carried well out towards the ends; of a dark green color and heavy weight. Specimens should be uniform.

Lettuce.

Cabbage: Heads should be large, well-rounded, compact, composed of crisp, sweet



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SHERIDAN NURSERIES
Shrubs & Perennials
34 North St. Toronto. The Nurseries Sheridan Ontario.

HONEY CONTAINERS

We have prepared a large stock of all sizes and therefore will be able to give

PROMPT SHIPMENT

In order to secure delivery and as present conditions make it impossible to guarantee prices we suggest you place your ORDER NOW.

Our Illustrated Circular and Price List has been issued. Did you receive your copy?

MACDONALD MFG. CO., Limited

Spadina Ave. and Richmond St.

TORONTO - - - CANADA



leaves, free from any discoloration.

Cos: Conical in shape with straight, upright growing leaves, well-bleached and crisp, and with a firm heart.

Onions.

Large: Shape, globular or flat, according to variety; globular shape preferred. Should be smooth and even in form, of good weight, and have a small, well-ripened neck, with solid, firm texture, especially at the base of the neck.

Pickling: Should range from $\frac{1}{2}$ inch to $\frac{3}{4}$ inch in diameter, be uniform in size and shape, clean, firm and white in color. Specimens should be uniform.

Parsley.

Head, large and bushy, with numerous, finely curled, dark green leaves, which should be crisp and free from discoloration of any kind.

Parsnip.

Roots should be of medium length, broad at top with a nicely hollowed crown, gradually tapering from crown to tip, smooth and straight, skin free from rust, firm in texture, and have a small core.

Peas.

Pods long and straight, dark green in color and well-filled with large, sweet-flavored, tender peas. Samples should be uniform in size and color, and not over-ripe.

Potatoes.

Specimens should have uniformity in size, with smooth, even shape, firm, solid flesh, fine and white in color, and be clean, and free from disease. Potatoes with shallow eyes are preferred to those with deep eyes.

Pumpkin.

Round or oblong in shape, symmetrical, large, thin-skinned, closely ribbed, firm in texture and heavy; with deep yellow or creamy yellow color, according to variety.

Radish.

Summer and Winter: Medium size; smooth, even form; free from insect damage and side roots; firm texture and mild flavor. Cross-sections should show solid, fine, white flesh. Specimens should be uniform.

Rhubarb.

Stalks, medium in diameter, long, straight and tender; with uniform color and mildly acid flavor.

(Continued on page 138.)



Fancy Fruit

grows only in well-tilled orchards. Intensive orchard tillage pays. Work in close to the trees with an

"Acme" Orchard Harrow

Cuts, crushes, mulches, levels, and compacts the soil—all in one operation. Keeps the orchard clean as a new pin. Extension and regular styles—a size to suit you. Our new free book, *The "Acme" Way to Crops That Pay*, is ready. Send today for your copy.

Bateman, Wilkinson Co., Limited
502 Symington Ave. Toronto, Ont.

No 23 61-2 ft. Wide



Secure Your Supply of Insecticides NOW

To destroy those POTATO BUGS and WORMS which reduce crop Production

Arsenite of Lime will have a tremendous sale this season owing to the high price of Paris Green. Spray with **ARSENITE OF LIME** the King of Bug Killers.

SAVE THE POTATO CROP. We said this last year—we say it again.

This is a great year for thrift and service. We must feed not only our own people, but also millions in Europe. The frightful waste of potatoes is a national reproach. Help stop this unpardonable extravagance. The potatoes we waste would feed Belgium. So kill the potato bugs. The Canadian Government urges spraying as a home duty. Canada's potatoes are appetizing, wholesome and nourishing, and the Canadian farmer who practices thrift places himself in the ranks of those who best serve their country. You can show your thrift in no more convincing way than by combating the national tendency to squander this country's wonderful potato crop—so **SPRAY, SPRAY, SPRAY**, with **ARSENITE OF LIME**. Beware of substitutes.

7857. Potato Bug Poison, Arsenite of Lime, Small	\$0.25
7858. " " " " " " " " Large	.45
7859. " " " " " " " " 5 Lbs.	2.25
7860. " " " " " " " " 10 Lbs.	4.25

Other spraying preparations of great value for the destruction of bugs and worms. Write for complete list and pamphlet on insects and insecticides free.

7738. Aphis Punk, for fumigating—Per pkg., 12 sheets	1.00
7739. Arsenite of Lead, Grasselli—Per lb.	.45
7741. " " " " " " " " 5 lbs.	2.00
7742. " " " " " " " " 10 lbs.	3.50
7743. " " " " " " " " Sterlingworth—Per lb.	.45
7744. Black Leaf "40" Sulphate of Nicotine—Per 1 oz.	.35
7746. " " " " " " " " $\frac{1}{2}$ lb.	1.50
7748. " " " " " " " " 2 lbs.	5.25
7788. Hellebore, for Rose Bugs, etc.— $\frac{1}{4}$ lb.	.25
7789. " " " " " " " " 1 lb.	.75
7825. Nikoteen— $1\frac{3}{4}$ oz.	.60
7826. " " " " " " " " 1 pt.	1.75
7827. Paris Green— $\frac{1}{2}$ lb.	.40
7828. " " " " " " " " 1 lb.	.70
7829. " " " " " " " " 5 lbs.	3.40
7830. " " " " " " " " Bulk, per 10 lbs.	6.75
7755. Bordeaux Paste Mixture, Grasselli—1 lb.	.50
7756. " " " " " " " " 2 lbs.	.90
7757. " " " " " " " " 5 lbs.	1.90
7760. Bug Death, Potato Bug Destroyer—1 lb.	.20
7761. " " " " " " " " 3 lbs.	.45
7762. " " " " " " " " 5 lbs.	.65
7763. " " " " " " " " 12 $\frac{1}{2}$ lbs.	1.25
7764. " " " " " " " " Bulk, per 100 lbs.	8.70
7842. Hammond's Slug Shot—1 lb.	.20
7843. " " " " " " " " 5 lbs.	.90
7844. " " " " " " " " 100 lbs.	14.50
7879. " " " " " " " " Whale Oil and Tobacco Soap	.30
7881. Radix Worm Eradicator—Lb.	.85
7882. IXL Worm Composition	.35

If required by mail in Ontario and Quebec, add 15c per pound, 20c for two pounds, and 5c for each additional pound.

When buying from dealers insist on Rennie's Seeds

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KING & MARKET STS TORONTO
ALSO AT MONTREAL WINNIPEG VANCOUVER



Getting the Most Out of your Team

Make their work easier. They are faithful friends and deserve the best treatment.

MICA AXLE GREASE

"Use half as much as any other"

Lightens the load. The mica forms a smooth, hard surface on the spindles and the grease keeps it there. Mica Grease gives the effect of roller bearings and reduces unnecessary strain on your team.

EUREKA HARNESS OIL

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Is the best harness life insurance on the market. It overcomes the worst enemies of leather—water and dirt. Leaves your harness soft, pliable and waterproof. A pure mineral oil free from acids and cannot injure the leather.

Sold in standard sized packages by live dealers everywhere.

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BRANCHES IN ALL CITIES



We have a large stock of all sizes

FLOWER POTS

FERN OR BULB PANS

1 AZALEA POTS and Rimless Pans

Orders Filled Promptly.

Send for Prices

THE FOSTER POTTERY CO., Ltd.
HAMILTON, ONT.

POULTRY YARD

Chicks in Brooders

More difference of opinion exists as to the value of brooding systems than in any other part of poultry rearing, which shows that no system is ideal for all conditions, but that success depends largely on individual handling and care. Many failures in brooding are due to weak chicks, which may be traced to faulty incubation or weakness in breeding stock. Successful chick raising depends primarily upon having healthy, vigorous breeding stock.

Avoid Lack of Ventilation.

Some of the most important faults in the management of brooders are overcrowding and lack of ventilation, while chickens fail to get sufficient exercise. The brooder should supply the proper temperature, be readily adapted to change in weather conditions, be easy to clean and well ventilated. The capacity should not be overestimated. One-half to two-thirds of the number of chickens commonly advised will do much better than a larger number. Brooders and hovers should have from one-half to two inches of sand, dry dirt, cut clover, or chaff spread over the floor, and in case they are kept in the brooder house, over the floor of this also. The hovers should be cleaned frequently, as cleanliness is essential in raising chickens successfully.

The best temperature at which to keep a brooder or hover depends on the position of the thermometer, the style of the hover, the age of the chickens, and the weather conditions. Aim to keep the chickens comfortable. As the operator learns by the action of the chickens the amount of heat they require, he can discard the thermometer if he desires. When too cold they will crowd together and try to get nearer the heat. If it is found in the morning that the droppings are well scattered under the hover it is an indication that the chickens have had enough heat. If the chickens are comfortable at night they will be spread out under the hover with the heads of some protruding from under the hover cloth. Too much heat will cause them to pant and gasp and sit around with their mouths open.

Temperatures for Brooding.

It is impossible to state for each case at what temperature the brooders should be kept to raise young chickens; however, it will run from 90 up to 100 degrees F. in some cases, as some broods of chickens seem to require more heat than others, an average being 93 to 95 degrees F. for the first week or 10 days, when the temperature is gradually reduced to 85 degrees for the following 10 days, and then lowered to 70 or 75 degrees F. for as long as the chickens need heat. As the chickens grow larger and need less heat, the lamps may be used only at night, and later on only on cold nights. Care should be taken to prevent chilling or overheating the chickens, which weakens them and may result in bowel trouble.

When chickens are first put into the brooder they should be confined under or around the hover by placing a board or wire frame a few inches outside (this would not apply to the small outdoor colony brooders). The fence or guard should be moved gradually farther away from the hover and discarded entirely when the chickens are three or four days old, or when they have learned to return to the source of heat. Young chickens should be closely watched to see that they do not huddle together or get chilled. They should be allowed to run on the ground whenever the weather is favorable, as they do much better than when kept continuously on cement or board floors. Weak chickens should usually be killed as soon as noticed, as they rarely make good stock, while they may become carriers of disease. Brooders should be disinfected at least once a year, and more frequently if the chickens brooded in them have had any disease.

Care of Hen With Chicks

When the chickens begin to hatch, the setting hen should not be disturbed unless she is restless and steps on or picks the chickens. In this case the chickens should be removed as soon as dry and placed in a basket lined with flannel or some other warm material and the basket placed near a fire or in some warm place until all the eggs are

BISSELL Double Action Harrows will thoroughly cultivate and pulverize any soil.



One Harrow is Out Throw; the other is In Throw. They are simply constructed, rigid and durable. The Gangs are flexible and the Disk Plates are so designed that they "hang" right into the soil. Bissell Harrows are built in sizes and weights suitable for horse or tractor use. Write Dept. N, for free catalogue. 98

T. E. BISSELL CO., LTD., Elora, Ont.

Mr. S. J. T. Bush, who was Superintendent of Farm Machinery for the State of New York, during 1917, and who has been President of the Western New York Horticultural Society for several years, in a letter dated Dec. 20th, 1917, states:—

Dear Sirs:—

Replying to your enquiry, beg to say I purchased a Bissell Double Action 8-foot Harrow from you last summer to go with my Case 9-18 Tractor, and I am glad to say that I am well satisfied with the harrow.

Owing to the rainy season we were unable to keep our orchards cultivated as we usually do, with the result that the weeds got such a start by the time it dried sufficiently to work the land, that it was impossible to do anything with it, except with a tractor and the work we were able to do with the tractor and Harrow was almost beyond belief.

Four times over these orchards, with the weeds three feet high when we began work, put them in as fine condition as if conditions had been normal.

Yours very truly,
(Signed) S. J. T. BUSH.

hatched. Another plan is to remove the eggs from the restless hen and place them under a more quiet one whose eggs are hatching at the same time.

When the eggs hatch unevenly, as is frequently the case, those which are slow in hatching may be placed under another hen. Hens often are restless after a part of the chickens are out, which allows the remaining eggs to become cool at the very time when steady heat is necessary to successful and strong hatches. Remove the egg shells and any eggs which have not hatched as soon as hatching is over.

The mother hen should be fed as soon as possible after the eggs are hatched, as feeding tends to keep her quiet. Hens that are not so fed will sometimes leave their nests. In some cases it is best that the hen remain on the nest and brood the chickens for at least 24 hours after the hatching is over.

It is important at this stage to guard against lice and mites. Before the hen and her chickens are removed to a brooding coop she should be dusted with a good insect powder. This should be repeated every two weeks, or as often as is necessary, until the chickens are weaned. If lice become thick on the chickens, or if they are troubled with "head lice," a very little grease such as lard or vaseline may be applied with the finger on the head, neck, under the wings, and around the vent. Great care is necessary, however, not to get too much grease on the chickens, as it will stop their growth and in some cases may prove fatal.

Poultry Notes

The soft-shelled egg is due to either over-fat or lack of lime in the ration; sometimes both.

Where the attention of the male becomes a perfect harassment, the nervous derangement may decrease the egg product.

The first few eggs of the brown-egg layer are rich in color, but as laying continues they become more pale. This is due to a certain pigment from which the coloring comes, and which in its first strength is of good color.

The shortage of labor and the tremendous increase in feed prices make it imperative that only the very best producers should be kept. Stock that would return a substantial profit in pre-war times, when feed was cheap, will now, under the changed conditions, show a loss. This probably applies more strongly to poultry than to any other class of live stock, as the securing of suitable feed is becoming more and more difficult.

Mercurial ointment is effective in exterminating head lice. This material is also sold as blue ointment or "blue butter," but mercurial ointment, which contains 50% of metallic mercury, is cheaper at present prices, on the basis of mercury contained, than the other form. Since it is stiff and difficult to apply by itself, it is best mixed with vaseline, lanolin or a similar substance in the proportion of one part of the ointment to two of the ingredient used, and is then fully as effective. The material is applied by taking a lump of it about the size of a pea and rubbing it thoroughly at the base of the feathers about the head. Head lice rest mainly upon the feathers, usually at the point where the barbs begin.

Farmers' Bulletin No. 887, dealing with Raspberry Culture, and Farmers' Bulletin No. 901, dealing with Everbearing Strawberries, both by Geo. M. Darrow, of the United States Department of Agriculture, Washington, are both excellent bulletins.



Bob Long

Union-Made

Overalls

Shirts & Gloves

My Dad wears 'em

Bob Long says:

"My overalls and shirts are the best made, because—they are roomy and comfortable. I designed them with the idea that you might want to stretch your arms and legs occasionally."

Insist on "Bob Long" brand. Ask your dealer for Big 11—the big grey overalls—the cloth with the test.

R. G. LONG & CO., LIMITED
TORONTO • CANADA 97

Don't Buy A Sprayer

THAT HAS ANY KIND OF PACKING

Packing Blows Out Wears Out Dries Out

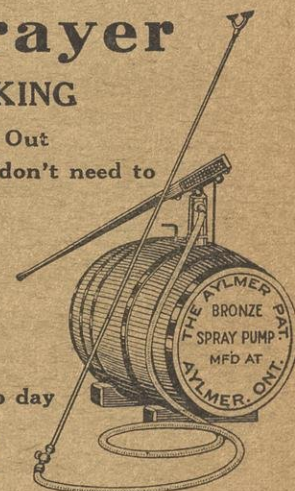
Why pay good money for all that trouble when you don't need to

The **Aylmer** Spray Pump
Has No Packing

Designed Right Made Right Stays Right!

Read our New Booklet "Facts in Brass" Write to day

The Aylmer Pump & Scale Co., Limited
AYLMER, ONTARIO



Kill Aphis

**Before Aphis
Kills Your Profits**

This tiny, sap-sucking insect, scarcely larger than a pin-head, is destroying apple profits all over the country. Feeding with its sharp, mosquito-like bill, it causes dwarfed, deformed, unmarketable fruit. Curls foliage. Weakens trees. Spray with



Black Leaf 40

40% NICOTINE

and control Aphis, Red Bug, Leaf Hopper and other soft-bodied, sucking insects. Aphis is making its appearance in many sections for the first time. Regarded by many growers as the most destructive apple insect. One aphid produces thousands in a few weeks. Spray with Black Leaf 40 and save your profits. Can be used with lime-sulphur, arsenate of lead, bordeaux and other sprays as recommended, or may be used separately, if desired. Mixes perfectly with water. Costs only about 1c per gallon diluted for the trees. Recommended by agricultural colleges and experiment stations. Send for

Free Spray Chart and Leaflets showing when and how to spray and how to protect fruit trees, vines and vegetables from these profit-killing insect pests.

The Kentucky Tobacco Product Co.
Incorporated
Louisville, Kentucky

Vegetable Standards

(Continued from page 135.)

Salsify.

A good type resembles a well-formed parsnip, broad at top, smooth and straight, gradually tapering to tip, free from side roots, texture firm and crisp, skin light brown in color. Flesh should have a milky appearance when cut, and a small core.

Spinach.

Specimens should be large with heavy foliage; broad, dark green, tender leaves, free from disease and insect injury.

Squash.

Winter: Should be large, heavy and firm in texture, with color and shape according to variety. Should not be over-ripe.

Vegetable Marrow.

Large size, oblong in form, smooth and even, with uniform thickness and good weight. Texture firm and not over-ripe. Color varies from a creamy yellow to a mottled green.

Tomatoes.

Medium in size with an even, well-rounded shape, smooth, fine, well-colored skin, firm texture, good weight and a small eye. Not over-ripe. Blossom end should be left on sample. Color varies according to variety—may be pink, bright red, or yellow. Specimens should be uniform.

Turnips.

Medium size with smooth, symmetrical form, free from side roots, firm in texture, and heavy. Cross-sections should show fine, firm, evenly colored flesh. Color varies from white to light yellow, according to variety.

Grow Vegetable Seed

Growers of root crops of all kinds who are likely to need seed for planting in 1919 would do well to take steps to insure at least a partial supply by growing it themselves. This can be done only by the use of roots already grown and now in the ground or held in storage. Such crops as carrots, beets, onions, turnips, rutabagas, parsnips, and salsify are involved.

Shortage of Seed Threatened.

Weather conditions in the regions where the chief seed supply of these crops is produced have been very unfavorable so far this year. This fact, together with the certainty that the usual European sources can not be relied upon to supply us, threatens a very considerable shortage for next spring's plantings. Since it takes two years to produce these seeds, this shortage can only be alleviated by the planting for seed of roots already grown.

Seed of the crops mentioned can readily be grown. It is highly desirable that persons having uniform, well-selected, and sound roots should plant some of them for seed.

How to Plant Roots.

Parsnips and salsify, being hardy, can be most easily provided. The shortage of these is not serious, as the amounts needed are not large. For such roots as must be stored, the time is at hand to choose those to be used for planting for seed production. It is of paramount importance that they be gotten into the ground as early as the soil and weather conditions permit. The prospect for a successful seed crop of these roots is very much improved if there is opportunity for root growth before the tops are started by warm weather. It is necessary to cover the roots with one or two inches of

Business as Usual

**THE ST. CATHARINES COLD STG. & FDG. CO.
LIMITED**

*The Old Reliable Headquarters for Spray Materials, Pumps and
All Fruit Growers' Supplies*

Our supply of Sulphur has arrived, can ship orders same day as received. We sell "Grasselli" Brand Lime-Sulphur Solution and Arsenate of Lead, "Niagara" Soluble Lime-Sulphur, Bluestone, Black Leaf 40, Fertilizers, Baskets, Crates and Berry Boxes, "Friend" and "Gould's" Power Sprayers and the labor-saving "Friend" Spray Gun.

Order NOW From the Firm that Always Has the Goods On Tap

St. Catharines Cold Stg. & Fdg. Co., Ltd.
St. Catharines - Ontario

soil to protect them from frost and light freezing after planting.

Rows of beets, carrots, onions, turnips, and rutabagas should be spaced from 3 to 4 feet apart. Plants should stand from 2½ to 3 feet in the row for all but onions, which may be spaced 6 inches. Cultivation should be thorough and shallow. The soil should be in good condition and should be fertile. It is often desirable to support the seed stalks by staking, but not essential in any case except that of onions. Bulletins describing how seed may be grown may be ob-

tained on application to the Dominion Seed Division, Ottawa.

I believe the Food Controller could give some protection to the producer and shipper of fruits and vegetables by making it compulsory for the consignee to accept shipments of perishable foods ordered by them when same arrives in good condition. The practice of holding up carload shipments at destination on the least possible chance of complaint against the shipment, and then en-

deavor to compel the consignor to reduce the sale price, probably all because of a falling market, is not a fair business method, and is not permitted under the Food Control Act of the United States.—Geo. McIntosh, Traffic Expert, Dominion Food Division, Ottawa.

Peach growers will find interesting information in Circular No. 23, issued by the Georgia State Board of Entomology, of Atlanta, Georgia, entitled "Helpful Hints on Dusting Peaches."



IMPERIAL SERVICE

If you are in doubt about the proper lubricant, *ask the Imperial Oil man.* He will give you courteous attention and sound advice on your lubrication problems. That is part of Imperial Service.

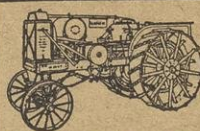
LOOK TO US FOR LUBRICATION ADVICE

TRACTORS, automobiles, stationary engines, threshing machines and binders, present different problems in lubrication. When you burn kerosene in place of gasoline, you change your lubricating requirements. Tight and loose bearings—cylinders and axles—require different lubricants. There is no one best lubricant for all purposes.

But there is a scientifically correct and extremely efficient lubricant for each type of engine and fuel. There is an oil for every lubricating condition. At Imperial Oil stations in all parts of Canada, you can find the oil that will make you forget lubrication troubles and give you the full power and usefulness of your machine.

Each Imperial lubricating oil is sold in steel barrels and steel half-barrels—most convenient and economical. There's no waste. You use every drop you pay for. And it's uniform and clean.

A Correct Lubricant for every Farm Machine



For Gasoline Engines,
Tractor, Auto or
Stationary
POLARINE OIL
STANDARD GAS
ENGINE OIL

For Kerosene Engines,
Tractor or Stationary
POLARINE OIL
HEAVY
IMPERIAL KERO-
SENE TRACTOR
OIL
(Recommended by Inter-
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For Open Bearings of
Farm Machinery

PRAIRIE
HARVESTER OIL

—very heavy body,
resists cold, won't
thin out with
moisture

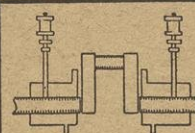
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—a thick oil for worn
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For Steam Cylinder
Lubrication, whether
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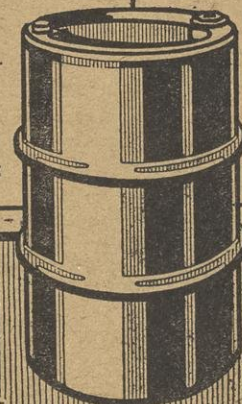
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—the standard pro-
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THRESHER
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For
Grease
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of Bear-
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a clean
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high
melting
point



IMPERIAL OIL

LIMITED

BRANCHES THROUGHOUT CANADA



Remember the Flowers

While every garden should produce food this year, add a touch of beauty to it with some flowers. It will make your home more attractive and you'll get greater pleasure out of your garden work.

When ordering your vegetable seeds, include some of our high-grade varieties of annuals and perennials. Here are a few of our most attractive ones.

Giant Comet Aster, mixed 10c Pkt
Antirrhinum (Snapdragon), 5c Pkt
Calliopsis or Coreopsis 5c Pkt
Candytuft, choice mixed, 5c Pkt
Cosmos, early flowering, mixed 10c Pkt
Mignonette 5c Pkt
Nasturtium, dwarf, mixed 10c oz. Pkt
Nasturtium, tall, mixed, 10c oz. Pkt
Poppy, The Shirley 5c Pkt
Sweet Peas, Keith's Sterling mixed, 10c per oz.; 1/4 lb., 25c; 1 lb., 90c.

GEO. KEITH & SONS

KING ST. E., TORONTO, ONT.

I will deliver to you car Fertilizer, twenty tons bulk, and sell it to you for the plant food it contains. Nitrogen, thirty cents lb.; Potash, thirty cents; Phos. acid, five cents; Lime, twenty-five cents hundred pounds. Green Ground Bones for sale for your fowl.

GEORGE STEVENS
364 Mark Street, PETERBORO', ONT.

Plan for Cooperage Stock

F. C. Whitman, Annapolis Royal, N.S.

Apple shippers know that if they have a large crop this year the supply of cooperage stock will not be equal to the demand for barrels. Within the past twelve months cordwood has jumped from \$4.50 to \$8.50 a cord for dry wood, and lumber has advanced 50%. This condition is proving interesting to many owners of woodland and should lead to more care of growing timber and a better and larger production from wood lots. In Nova Scotia wood of this kind has seldom been treated or handled as an annual producing crop.

Outside of the bigger interests in lumber production, the matter of cooperage and the pressing need of an annual supply of barrels and boxes should appeal strongly to the farmer. For many years dependance has been placed on the saw mills for a supply of side boards, and log ends to be cut into heads and staves. This supply has fallen off, although the price of material has advanced to twice its former cost. The supply of hoops has been uncertain for several years, and notwithstanding the importation of cooperage and hoops from New Brunswick, Ontario and abroad, the cost of a barrel has increased, and it is likely to be more difficult to obtain and dearer in the future.

Nearly every farm in the Annapolis valley has a wood lot, which with proper care can be made a source of profit in producing wood for farm use and for cooperage. The pinch in coal these years makes a generous woodpile at the dooryard look pretty good.

For stave wood spruce is the best. It only requires a small sized tree; and now is the time to consider whether it would not be good planning to let the wood lot produce stave wood. A thinning out of too thick a growth, trimming off the low branches, letting in the light and air, will quicken the growth, and turn a wood lot thicket into a producer of good wood.

Just before the war, a buyer of hoops could not obtain supplies in Nova Scotia, and on enquiry found that the hoops required could be imported from France at a price delivered in Halifax the same as usually paid for this kind of hoop produced in New Brunswick and Nova Scotia.

The French grow the hoop poles as a crop; they have acres of hoop pole trees that are systematically cut every year; and are thus able, not only to supply their own wants, but also export to other countries. Similar care for young birch in this country might be made to produce an annual

crop, and a plot of land so cared for would have an enhanced value.

The food supply has become one of the main considerations in the winning of the war. For this reason a greater consumption of such food products as fruits and vegetables is being urged upon the people of Canada. Surely, therefore, it is not only our patriotic duty, but to our personal and financial advantage to carefully look after our orchards as well as by extending, where possible, our efforts to field crops. With reasonable prices, it is probable that 1918 will see an enormously increased consumption of these foods.

I am very much pleased with The Canadian Horticulturist.—Mrs. Ward, Toronto Ont.

SPRAYERS

A complete spraying outfit at a very low price. Write for catalogue of the Canuck Sprayer—a large number in use, small, compact and highly efficient. Only weighs 600 lbs., including engine. Mounted or unmounted. Immediate shipment from stock guaranteed. Write sprayer department.

R. A. Lister & Company
of Canada, Limited

58 Stewart St., : TORONTO, ONT.

APPLE BARRELS

We ship them all over Ontario.
Machine-made, Standard size.
Get our prices.

Contracts made with Fruit Associations.

SARNIA BARREL WORKS,
Sarnia, Ontario.

DON'T NEGLECT THE ORCHARD

ORDER YOUR MATERIALS AND EQUIPMENT NOW

Soluble Sulphur, Lime Sulphur, Raw Sulphur, Arsenate of Lead [Paste or Powder],
Calcium Arsenate, Dusting Mixtures, Dusting Sulphur

All Materials Strictly High Grade---Fresh, New Stock

Niagara Hand and Power Dusters, The Famous Bean Hand and Power Pumps,
Spray Guns, High Pressure Hose, All Accessories

Oldest established Spray business in Canada. Our Spray Calendar,
Catalogues and History of Dusting, are free. Order to-day.

Niagara Brand Spray Co. Ltd.

Burlington, Ont.



Trade Mark

UNITED STATES GRADING LAWS.

In view of the changes that it is understood may be made by the Dominion Government during the present session of Parliament in the standard grades of apples the following information concerning new grading regulations which it has been proposed shall be established by the United States Government should be of interest as well as the Massachusetts Apple Grading law and the New York law governing the second grade of apples and ungraded apples. It has been proposed that four grades shall be established in Canada, a number 1, a number 2, a domestic grade and a number 3. These were described in our April issue.

United States Regulations.

The proposed new United States regulations are as follows:—

"Standard A" shall consist of hand-picked, properly packed apples of one variety, which are well grown specimens, normal in shape, of not less than fifty per centum of good color for the variety, and which are practically free from dirt, insect injury, fungous disease, bruises, and other defects, except such as are necessarily caused in the operation of packing.

"Standard B" shall consist of hand-picked, properly packed apples of one variety, which are well grown, and practically free from insect injury, fungous disease, or other defects; provided that apples having healed-over insect punctures, small scab or blotch infections, fruit spots, or other defects not including worm holes, which, taken singly or collectively, do not materially deform or discolor the fruit, shall be admitted to this grade.

"Unclassified" shall consist of apples which do not conform to the foregoing specifications of grade, or which though conforming are not branded in accordance therewith; provided that if more than ten per centum of the apples show decay, or worm holes, or are badly deformed or badly discolored by scab, blotch, insect injury, or other defects, the package containing them shall be marked "culls" in addition to the other marks or brands required.

A tolerance of 6 per centum below the standard shall be allowed in the Standard Fancy grade, 10 per centum in the Standard A grade, and 15 per centum in the Standard B grade; provided that not more than half the foregoing tolerance values shall be allowed on any single grade specification or defect. Such tolerances shall apply to size, color, and other grade specifications and shall be computed by counting or weighing the specimens which are judged to be below the standard for the grade in any respect, and those which are found to be smaller than the minimum size, marked on the package.

In all the grades specified, the apples included in the face or shown surface shall fairly represent the size, color, and quality of the apples in the package.

Marking requirements. Every package of apples which is repacked shall also bear upon the same end of the package the name and address of the person by whose authority it is repacked, such name and address to be preceded by the words "repacked by."

Massachusetts Apple Grade Law.

The Massachusetts Apple Grading Law reads:—

"Massachusetts Standard A" shall include only apples of one variety, which are well matured specimens, properly packed, of medium color for the variety, normal shape, sound, practically free from disease, insect and fungus injury, bruises and other defects except such as are necessarily caused in

RENNIE'S SEEDS

For HIGH Production

LOOK FOR THE STARS

Every page in the Rennie 1918 catalogue is a guide to War-time production. But there are a number of outstanding values and these are called to your attention by a star border such as encloses this.

SEEDS of high productive power are a vital War-time necessity. Not only must every square yard of available ground be made to produce, but Rennie's Seeds must be sown to ensure the finest possible crop. It is a War-time duty. When buying from dealers insist on Rennie's. The following seeds can be obtained from dealers or by mail.

PLANT THESE NOW!!

	Pkt.	oz.	¼ lb.	lb.	5 lbs.
BET —Crosby's Egyptian.....	.05	.25	.85	2.50	
CABBAGE — Danish Summer					
Roundhead.....	.10	.90	2.75		
CARROT — Rennie's Market					
Garden.....	.10	.40	1.20	3.50	
CORN —Rennie's Golden Bantam	.10		.25	.65	
LETTUCE — Burpee's Earliest					
Wayhead.....	.10	.35	1.00	3.00	
ONION —Early Yellow Danvers	.10	.40	1.35	4.40	
Rennie's Extra Early Red...	.05	.35	1.00	3.75	
PEAS — Little Marvel.....	.10		.15	.45	2.00
Senator—Best Second Early ..	.10		.15	.45	2.00
TOMATO — Bonny Best.....	.10	.60	1.75		
Blue Stem Early (King Edward)	.10	.60	1.75		
TURNIP —Breadstone (Swede)...	.05	.25	.75	2.50	
			Prepaid	Not Prepaid	
			lb.	5 lbs.	lb. 5 lbs.
ONION SETS —Yellow Multiplier Sets	.30	1.40	.20	.90	
White Multiplier Sets.	.50	2.25	.40	1.85	

FLOWER SEEDS

	Pkt
New Giant Asternum—Mixed.....	.15
Rennie's XXX Defiance Balsam—Mixed.....	.15
Rennie's XXX Hybrids Climbing Nasturtium—Mixture.....	.10
Rennie's XXX Chameleon Dwarf Nasturtium—Mixture.....	.10
Grandiflora Phlox Drummondii—Mixed.....	.10
Rennie's XXX Giant Spencer Sweet Peas—Mixture.....	.15
Rennie's XXX Mammoth Mixture Verbena.....	.10

When buying from dealers, insist on Rennie's. If your dealer hasn't them, we will ship direct. 4

THE WILLIAM RENNIE COMPANY LIMITED.
KING & MARKET STS TORONTO
 ALSO AT MONTREAL WINNIPEG VANCOUVER

GOOD CROPS YEAR AFTER YEAR



What a difference that would make to many a farmer's bank balance. Well, it's possible—and the Spramotor can bring it about. We are sole makers of the world's foremost spraying machines, the

Spramotor
 It isn't a SPRAMOTOR unless we made it

in many styles and sizes from \$7 up. Send us particulars of your spraying needs and we will forward by return mail, absolutely free, a copy of our valuable illustrated work on Crop Diseases, also full details of a Spramotor that will best do your work. Write to-day

Made in Canada—No Duty to Pay.

SPRAMOTOR WORKS, 4015 King St., London, Canada

The Farmer-Banker Alliance



You go to your lawyer for legal advice; to the doctor for medical advice; why not to The Merchants Bank for financial advice?

If you want a loan to buy cattle, hogs or equipment—if you want information as to how to invest money—come to those who make a business of financial matters, and are in a position to give you sound and impartial advice.

THE MERCHANTS BANK

Head Office: Montreal. **OF CANADA** Established 1864.

with its 102 Branches in Ontario, 32 Branches in Quebec, 19 Branches in Manitoba, 21 Branches in Saskatchewan, 53 Branches in Alberta, and 8 Branches in British Columbia serves Rural Canada most effectively.

WRITE OR CALL AT NEAREST BRANCH.

CLEANER and BETTER FRUIT RESULT FROM SPRAYING



If you have had trouble in selling your apples or other fruit at good prices, because they have been scabby, wormy and distorted, why not insure thorough spraying by using a

Spramotor

It isn't a SPRAMOTOR unless we made it

Thorough spraying will enable you (under normal conditions) to produce at least 75 per cent. No. 1 fruit, and at the same time improve the condition of the trees.

The Spramotor has demonstrated its superiority in performance and build. There is a machine suited to your particular needs—hand or power. Prices from \$7 to \$400.

Made in Canada—No Duty to Pay.

Write to-day for further information and Free Illustrated booklet on crop diseases.

SPRAMOTOR WORKS

4014 King St., London, Can.

the operation of packing; provided, that apples of one variety which are not more than five per cent. below the foregoing specifications may be graded as "Massachusetts Standard A".

"Massachusetts Standard B" shall include only apples of one variety, which are well matured, properly packed, practically normal shape, practically free from disease, insect and fungus injury or any other defect that materially injures the appearance or useful quality of the apples, and which may be less than medium color for the variety: provided, that apples of one variety which are not more than ten per cent. below the foregoing specifications may be graded as "Massachusetts Standard B."

"Ungraded." Apples not conforming to the foregoing specifications of grade, or, if conforming, not branded in accordance therewith, shall be classed as ungraded and so branded.

"Section 4. The minimum size of the fruit in all grades, including the ungraded, shall be marked upon the package, and shall be determined by taking the transverse diameter of the smallest fruit in the package at right angles to the stem and blossom end."

New York Grades.

The New York law requires that the "New York standard B grade" shall consist of apples of one variety, which are well matured, hand-picked, properly packed, practically normal shape, practically free from dirt, disease, insect and fungus injury; or apples of one variety which are not more than fifteen per centum below the foregoing specifications on a combination of all defects or five per centum on any single defect.

"Ungraded." Apples not conforming to the foregoing specifications of grade, or, if conforming, are not branded in accordance therewith, shall be classed as ungraded and so branded. The minimum size of the fruit in the package shall also be branded upon it as hereinafter specified and in addition to the other marks hereinafter required."

A 1918 edition of the well known booklet, 5,000 Facts About Canada, by Frank Yeigh, is being distributed by Canadian Facts Publishing Co., 588 Huron St., Toronto. It is full of interesting information about Canada and things Canadian.

PERRY'S SEEDS

Alpine and perennials, unique collection; many new varieties unobtainable from any other source.

Hardy and adapted for Canadian climate.

HARDY PLANT FARM, ENFIELD, ENGLAND

SANDER & SONS ORCHID GROWERS

The Finest Stock in the World

Catalogue on Application

ST. ALBANS - ENGLAND

TREES & SHRUBS
BROWN BROTHERS Co.
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BROWNS NURSERIES. ONT.



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**Send for
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Good Prices Always

For Your Fruit and Vegetables

OUR facilities enable us to realize top prices at all times for your fruit, vegetables or general produce. Aside from our large connection on the Toronto Market, we have established branch warehouses with competent men in charge at Sudbury, North Bay, Cobalt, Cochrane and Porcupine. In time of congestion on the Toronto market we have a ready outlet through these branches. We never have to sacrifice your interests.

Branch Warehouses:
Sudbury, North Bay,
Cobalt, Cochrane and
Porcupine.

H. PETERS
88 Front St. East, Toronto



References: The Canadian Bank of Commerce (Market Branch) and Commercial Agencies.

The Outlook for Small Fruit

L. Harrison, Manager, Waterford Fruit Growers' Association, Waterford, Ont.

From the Waterford District we ship about one million boxes of strawberries, and about one-half of that amount of raspberries. Our patches are looking well, though we have a reduced acreage, and perhaps rather thinner rows. Prices this year are bound to run high. Every berry we grow will be wanted, and it is up to us to put our fruit on the market in better shape than we have ever done before.

My reason for looking for high prices is, that the demand will be great for both raspberries and strawberries for canning and preserving purposes. While the importation from the States is likely to be heavy, yet the supply is not likely to exceed the demand, owing to the enormous export demand for jams and canned fruits. Canada and the States are practically the only countries able to fill this demand. The few ships available for transportation and our nearness to the Mother Country means that the bulk of the goods must come from this continent.

Domestic consumers of berries will also show an increase—the urgent need of conserving every ounce of food will make the matter of home canning of special importance. We must also look for a probable increased consumption of all fruit during

MR. GARDENER

To aid in greater production we are growing hundreds of thousands of choice vegetable plants. Quality plants are the prime requisite to make your efforts worth while. We recommend the following choice kinds.

TOMATO PLANTS—John Baer, Bonny Best, Chalk's Early Jewel, Matchless, The Stone, Greater Baltimore, strong transplanted plants at 35c per dozen; \$2.40 per 100; \$20.00 per 1,000.

CABBAGE—Copenhagen Market, Early Jersey Wakefield, Allhead early and best late sorts ready for planting out—20c per dozen; \$1.50 per 100.

CAULIFLOWER PLANTS—Dry Weather, Gilt Edge, Early Snowball, Early Erfurt; 25c per dozen; \$2.00 per 100.

CELERY PLANTS—Paris Golden Yellow and White Plume at 20c per dozen; \$1.50 per 100.

For \$2.00 you can select 100 plants of the above, not less than ten of a kind. Also for \$2.50 a beautiful collection of fifty flower plants for window and garden; each variety assorted colors.

5 Geraniums, 5 Coleus, 5 Salvia, 5 Snapdragon, 5 Verbenas, 10 Giant Petunias, 5 choice assorted ferns, 10 choice aster plants.

ROSES

Choice Hybrid Tea Roses, suitable for garden or pot culture. These will flower all summer, strong 2-year-old plants in good variety of colors—Ophelia, White Killarney, Killarney Brilliant, Sunburst, Richmond and Mrs. Geo. Sawyer & Hoosier Beauty—6 for \$1.00; 12 for \$1.75.

Cash Must Accompany Orders

THE MITCHELL NURSERY COMPANY

MITCHELL - ONTARIO

An Attractive Angle Steel Frost Fence

This Picket Fence is massive and dignified in appearance. It acts as the frame to a picture, by setting off the grounds and buildings to good advantage. City homes, country estates, parks, libraries, church-yards, cemeteries and schools take on an added charm and beauty when surrounded by this permanent **Frost Angle Steel Fence**.

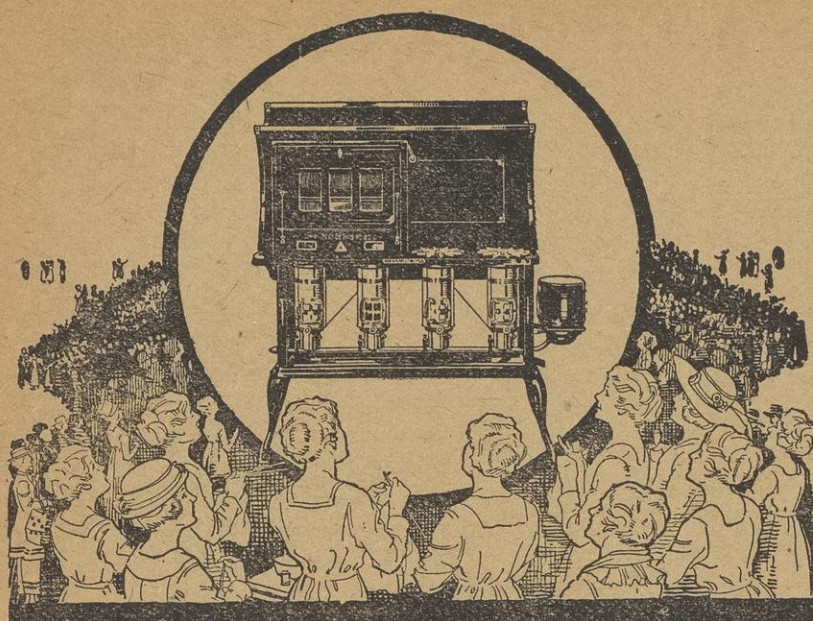
Gates, single or double, are made to match the fence, which is furnished in panels eight feet in length. Shorter panels are furnished where required. This fence is finished with a coat of black, weather-proof paint.

Catalog and prices on request. If you do not know the name of a nearby **Frost** dealer, write us direct.

Frost Steel and Wire Company, Limited
Hamilton • Canada

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THE STOVE WITH 3,000,000 FRIENDS

3,000,000 housewives have discovered the way to better cooking, cooler kitchens and less work. They use the New Perfection Oil Cook Stove.

Ask *your* neighbor. She knows the New Perfection Oil Cook Stove is dependable and easy to operate. She knows the Long Blue Chimney gives a clean, intense heat—without odor, or smoke. She knows the convenience and economy of using oil for fuel.

The New Perfection Oven bakes unusually well—makes the stove a complete cooking device.

The Cabinet adds to the appearance of the stove and provides extra room for utensils.

Royalite Coal Oil gives best results.

IMPERIAL OIL LIMITED

BRANCHES IN ALL CITIES

NEW PERFECTION
OIL COOK STOVE

TREES

For Spring Planting

Two year old Apple, Pear, Plum, Sweet and Sour Cherry Trees, Dwarf Pear and Quince. Any variety at about one-half the usual price. All varieties strictly A No. 1, straight and clean.

Your orders solicited. Write for prices.

FENWICK NURSERIES

FENWICK, ONT.

PANSY "Canadian Beauties"

If you wish to enjoy Pansies of great Perfection in form, coloring and size, we offer you, under the above title a choice product. Every flower is a queen; every plant a picture to behold. It is a blending of every imaginable color and combination of color. Per packet 50c

Delphinium—"Majestic Giants"

from a choice collection of named varieties. Packet 25c

WM. McSKIMMING, Pansy Specialist
230 ELIZABETH ST., GUELPH, ONT.

their respective seasons, owing to the need of conserving bread, meat and other food stuffs.

I anticipate a further reduction in the acreage of raspberries. For the last few years we have found this crop to be anything but a really paying concern. The factories have not been able to give us a remunerative price. This has caused many growers to do away with their patches. In addition the increased difficulty in getting them picked and the higher prices which the grower has had to pay to get them picked has discouraged many from planting. I cannot see that the future should warrant any man to desist from planting, as we are not likely to see low prices prevail again for some time.

Some of us are apt to groan over the labor situation. As far as the picking is concerned, we shall get the fruit picked and must be prepared to pay more, but to get the help is the most important. There is the Women's National Service Organization, which last year we tried at Waterford. Many farmers held back from taking advantage of this help. They felt certain that the girls would never stand a hot day and would give in too readily. Let me tell you right here that they rendered us most valuable services. They were a credit to their organization, and a credit to themselves, and that, in spite of the hottest summer we can remember. Don't despise the help these girls are again offering the grower this year. Make all the use you possibly can of them, and encourage the movement, which is patriotic and national. It may interest some of you to know that our village merchants are considering closing their stores three days a week while the berry crop is on and turning out to help pick. This will release quite a few hands to help. If this spirit prevails throughout the fruit sections, much will be done to relieve a possible shortage of picking help.

Women's Help

Dr. A. J. Grant, Thedford, Ontario.

If we are blessed with a good crop of apples this season we will have to depend very largely upon female help. The young women and girls of this country have responded nobly to the call for help from all quarters. Their assistance during last year's fruit harvest was invaluable, and we should be ready to pay par value for their labor every time. While true patriotism is calling these noble women to manual labor, we must not forget that we are being helped over stony places and we should do our utmost to make life pleasant and agreeable for them. Pay them the best wages that conditions will afford, but we have not done enough then, unless we reciprocate in the spirit which sends these willing hands to help us. A great deal of the picking will have to be done by women and women sorters, after some experience and careful teaching, will distance men altogether.

An excellent bulletin, entitled The More Important Fruit Diseases of Ontario, by Prof. J. E. Howitt and Prof. Lawson Caesar, of the Ontario Agricultural College, is timely, instructive and valuable. It deals with the dusting of trees for insects and diseases, pear blight, pear scab, leaf spot of pear, little peach, and many other subjects of the same character. Write for it to the Ontario Department of Agriculture, Toronto.



Get Behind the Wheel of a Ford and Drive

TRY it just once! Ask your friend to let you "pilot" his car on an open stretch. You'll like it, and will be surprised how easily the Ford is handled and driven.

If you have never felt the thrill of driving your own car, there is something good in store for you. It is vastly different from just riding—being a passenger. And especially so if you drive a Ford.

Young boys, girls, women and even grandfathers—thousands of them—are driving Ford cars and enjoying it. A Ford stops and starts in traffic with exceptional ease and smoothness, while on country roads and hills its strength and power show to advantage.

Buy a Ford and you will want to be behind "the wheel" constantly.

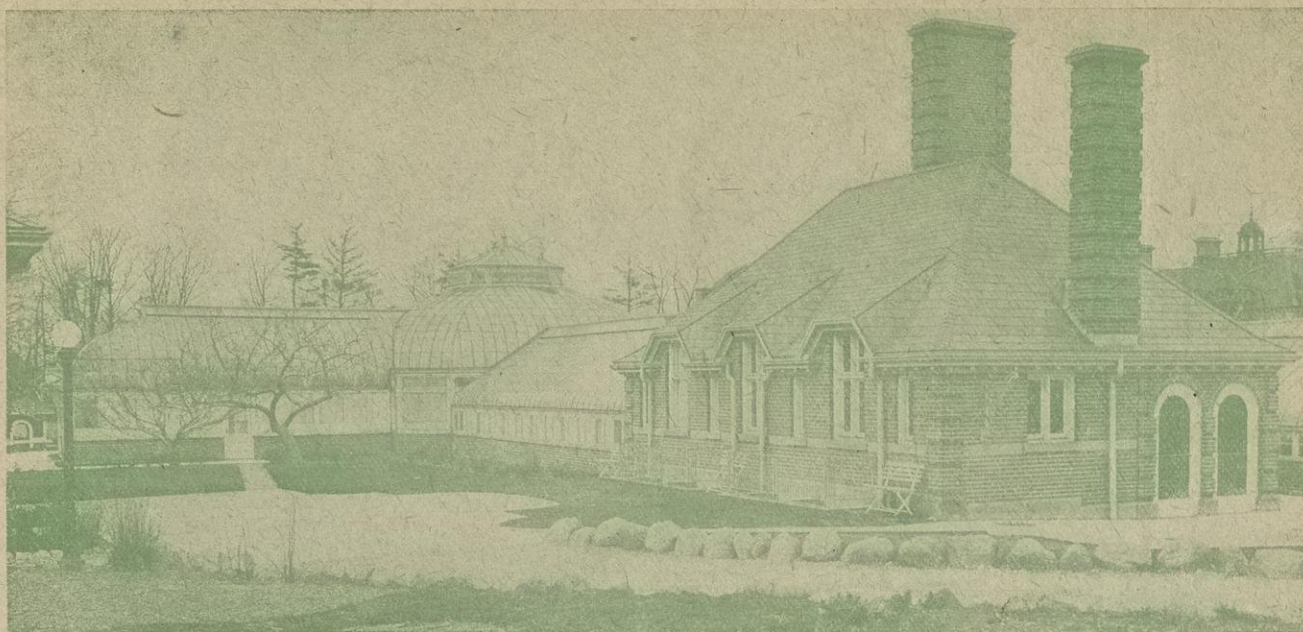
Ford

THE UNIVERSAL CAR

Runabout	-	\$575
Touring Car	-	\$595
Coupe	-	\$770
Sedan	-	\$970
Chassis	-	\$535
One-ton Truck	-	\$750

F. O. B. FORD, ONT.

Ford Motor Company of Canada, Limited
Ford, Ontario



More About the Unusual Greenhouse Layout of Sir John C. Eaton

ADMITTEDLY it is one of the most *attractive* in Canada. But what of its *practical* side?

How many square feet of space does it cover, or its acre equivalent?

Including the swimming pool, it covers 6,875 square feet, or 1-6 of an acre. Of this space, 2,925 square feet are devoted to benches and beds for the plants, 825 square feet for an open space in the palm room for tea tables and chairs, 1,250 square feet are given to the swimming pool room.

From neither of these photos can you see the entire layout. There is another long wing house of which you just catch a glimpse back of the service building.

The dominating feature of the layout to us is, that it combines so successfully, the *practical* with the *ornamental*. Each plant room or compartment furnishes the very height of growing conditions.

Should you desire further facts or even views of the palm room or swimming pool, don't hesitate to let us know.

Send for Catalogue No. 106

Lord & Burnham Co.

Limited
of Canada

Builders of Greenhouses and Conservatories

TORONTO
Royal Bank Bldg.

Factory, St. Catharines, Ontario

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Transportation Bldg.