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Wisconsin State Cranberry Growers' Association. Twenty-seventh annual meeting, Grand Rapids, Wis., January 13th, 1914. Twenty-sixth summer meeting, Cranmoor, Wis., August 19th, 1913. 1913/1914

Wisconsin State Cranberry Growers Association
[s.l.]: [s.n.], 1913/1914

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....WISCONSIN STATE....

Cranberry Growers' Association



Twenty-Seventh Annual Meeting,

Grand Rapids, Wis., January 13th, 1914

Twenty-Sixth Summer Meeting,

Cranmoor, Wis., August 19th, 1913

LETTER OF TRANSMITTAL.

To the Honorable Francis E. McGovern.

Governor of the State of Wisconsin:

Sir:—I have the honor to submit herewith in requirement of law, the Twenty-seventh Annual Report of the Wisconsin State Cranberry Growers' Association, containing papers read and discussions thereon, together with an account of moneys disbursed for the year 1913.

Respectfully yours,

Cranmoor, Wis., Jan. 15, 1914.

J. W. FITCH, Secretary.

27th Annual Report

Wisconsin State Cranberry Growers' Association

Tuesday, January 13th, 1914

Held at Grand Rapids, Wis., Council Rooms, West Side.

Andrew Searls, President, presiding.

ADDRESS OF WELCOME—Andrew Searls, President.

In my talk to you this morning, I am glad to be able to say there has been a decided move all along the line in regard to improved methods in the management of your marshes. I feel you are on the right road to great success in the business. When we all get to moving in the right direction, there is bound to be something doing. Nearly every marsh in the country gets its vines combed out to date after its berries are gathered. Some pruning is being practiced. I feel that this should be better understood, for the average grower is pretty liable to overdo this part of the business. I think the beginner would do better to content himself by freeing his vines of runners only.

I was talking with a grower this last season who had been experimenting in the way of pruning. It seems he had pruned a small section, and he had done his work so thoroughly, that he had very few berries to gather on this ground, but he said it was in nice shape for the next year. He should have left vines for this year's crop as well. In fact, pruning should be done with the greatest care. I should hesitate to put a pruning rake in the hands of an inexperienced man, unless I could be close at hand where I could see what he was up to. If there seems to be too great an amount of vines upon the ground, it is often a better plan to sand quite heavy. Fully one inch of sand. First straighten out the vines as well as possible. Then prune out in the runners.

Many express their intentions to sand some of their vines this winter and give it a fair trial. In these trial tests, ground should be selected where good drainage can be had without effecting the whole field, care being taken to keep the ground free from sphagnum moss.

As I was saying, when we all get busy, we shall certainly see great improvements in the cranberry business of the state. I understand Mr.

Whittlesey has done some big stunts in harvesting berries the past season. Mr. Whittlesey has been pruning his vines, the pruning and training them for growing and harvesting better crops, and he is entitled to his reward which he has earned. I am going to give him a chance to tell us something of his success, as he has had several years of experience in this new work, and we expect every man to do his duty in helping to uplift his business.

I hope you will thresh over this subject of the better culture, sanding, re-sanding, and pruning, the laying out of marshes, importance of having deep ditches of reasonable width. I expect Mr. Lewis to tell us something on this point. I might say here Mr. Lewis has had a year's experience on the marshes of Massachusetts, which he assisted in building and planting a cranberry marsh, as well as viewing many of the best bogs on the Cape. I will also state Mr. Lewis is now engaged in the building of a bog in the North West part of the state, which, in my opinion, comes the nearest to perfection of anything in the way of cranberry marshes that I have ever seen.

I hope the subject of fertilizers also may be discussed quite freely. There is little doubt, great benefits may be derived from the judicious use of some fertilizer on our marshes.

I was shown two samples of berries, both of the same variety, picked on the same date, picked from the adjoining plats, and which was entirely different in appearance that it was hard to believe they could be of the same variety. One had been treated to rock phosphate, and the other had had no fertilizer. The first was large, fine looking berries. The second was much smaller and not nearly so fine in finish. I hope you will discuss the fruit worm problem.

This pest continues to do a great deal of damage to our growing crops. Mr. Malde has been making some new discoveries this past season which should be of benefit, and seems to point the way by which we are likely to be able to control this pest. The treatment of sphagnum moss should be better understood. Many of the growers seem to think any old thing in the way of air slacked lime will do the work equally well, which is very doubtful in my opinion, and I have not had a very extended experience in this matter, but what I have said seems to me points to the fact that if you want good work done, fresh slacked lime should be used. I have used screenings slacked by a new process. I will try and have it described by my brother who taught me the trick.

Minutes of 1913 Annual Meeting.

J. W. Fitch, Secretary.

The 27th annual meeting of the Wisconsin Cranberry Growers Association was held in Grand Rapids, in the Council rooms, West side, Jan. 14th, 1913.

President Searls called the meeting to order at 10 a. m. The minutes of previous meeting were read and accepted. The reports of the secretary and treasurer showed the expenses to have been \$416.78 with receipts of \$268.35, which with the balance on hand of 79.88 made total resources of \$342.26, with orders 167, \$35.42 and 168, \$58.90 outstanding, there was a cash balance left of \$25.81. The accounts were found correct by the auditing committee and vouchers were destroyed.

On motion duly passed the secretary cast the ballot for the old officers. President—Andrew Searls, Grand Rapids; Vice President—O. O. Potter, Warrens; Secretary—J. W. Fitch, Cranmoor; Treasurer—H. J. Gebhart, Black River Falls; Member of Executive Committee—J. J. Emmerick, Cranmoor.

President Searls in his opening address called attention to the fact that under the practice of clean culture the element of risk was being greatly lessened and that every grower should improve his bog as rapidly as possible.

As usual, Mr. O. G. Malde's account of the year's work on the experiment station proved very interesting and its discussion and the answering of questions by Mr. Malde brought out much valuable information.

The address of the secretary, J. W. Fitch, was a brief history of the past and present conditions of the industry.

President Searls gave a talk on harvesting in which he brought out the fact that he had found dry scooping much more satisfactory than scooping with a light flood the berries being much easier to pack and much better keepers. He also spoke of the great advantage clean culture gave in harvesting.

A discussion of the merits of the principle varieties proved very interesting.

Mr. A. U. Chaney sent a paper on Wisconsin berries on the market, which gave some interesting facts.

Mr. A. C. Bennett had a paper on the prevention of decay in fruit which explained the reason for and means for delaying decay in fruit.

Mr. Malde explained the new method of the direct printing for recording types and varieties in fruit.

Mr. H. J. Gebhardt told of his experience with galvanized tiling for bulkheads.

The following resolution was adopted:

WHEREAS, there is to be paid station of the weather bureau established in the Wisconsin Valley

BE IT RESOLVED, That as the cranberry industry is preminent in the Wisconsin Valley in need of such service, that the station be established in Grand apids.

The president appointed as a committee to attend to the matter Judge

Gaynor, E. P. Arpin and M. O. Potter. The Wisconsin crop proved to be 52,000 barrels.
 J. W. FITCH, Secretary.

Report of Secretary J. W. Fitch for the year 1913.

Received from dues.....	\$ 13.00
Order No. 169, July 10, 1913, Gaynor Cran. Co. rent of station 1912-1913	30.00
Order No. 170, July 10, 1913, Grand Rapids Tribune, Reports and Printing	41.00
Order No. 171, Sept. 27, 1913, J. W. Fitch, Expenses of August Convention	54.18
Order No. 172, Sept. 27, 1913, J. W. Fitch six months salary.....	40.00
Order No. 173, Jan. 13, 1914, J. W. Fitch six months salary and postage	56.12
	<hr/>
	\$221.30

Report of Treasurer H. J. Gebhardt, 1913.

Jan. 15, 1913, Balance on hand	\$ 25.81
June 1913, State Aid.....	250.00
Jan. 13, 1914, Received from Secretary for dues	13.00
	<hr/>
Total	\$288.81

Expenses:

Order No. 167, Jan. 1913, Arpin Cran. Co. for fixtures for pump experiment	\$ 35.43
Order No. 168, Jan. 14, 1913, J. W. Fitch six months salary and postage	58.90
Order No. 169, July 10, 1913, Gaynor Cran. Co. rent of Experiment Station, 1912-13	30.00
Order No. 170, July 10, 1913 Grand Rapids Tribune, Reports and Printing	41.00
Order No. 171, Sept, 27, 1913, J. W. Fitch Expense of August 1913 Convention	54.18
Order No. 172, Sept. 27, 1913, J. W. Fitch six months salary	40.00
	<hr/>
Total expense paid	\$259.51
Balance	\$288.81
	<hr/>

Balance

On motion made, seconded and carried, the secretary cast the ballot for the old officers.

Predsiént—Andrew Searls, Grand Rapids.

Vice President—O. O. Potter, Warrens.

Secretary—J. W. Fitch, Cranmoor.

Treasurer—H. J. Gebhardt, Black River Falls.

Member of Executive Committee—J. J. Emmerick, Cranmoor.

Address of Secretary J. W. Fitch.

It is becoming more evident every year that the campaign for clean culture, pruning and sanding is bearing fruit, and that the result will be to greatly increase the output of cranberries in Wisconsin and it is a matter of satisfaction to see how wisely the present crops are being marketed and disposed of at good prices and all growers realize or should realize that with proper advertising and attention to the retail trade so that too high prices are not asked any probable increase can be easily taken care of. Many people do not care for cranberries simply because as served in many hotels, eating houses and homes they taste more like medicine than the delicious flavor they have when properly cooked. A splendid opportunity is offered for enlightening the people through state and county fairs.

Along with the improved methods of cultivation resulting in surer and more profitable crops will come an awakening of capital, which is always looking for profitable investments, to the value of the industry and its possibilities and the exploitation of the same and it is a matter of congratulation that through the establishment and development of our cranberry station by the college of agriculture, expert advice may be obtained as to the value and possibilities of any location for the successful cultivation of the cranberry.

Report of the Work at the Cranberry Station for the Season of 1913.

The Cranberry Station work was started April 12th, with general cleaning up of preparatory to spring work.

The flood was dropped the 28th of April, being the latest in several years, owing to cold weather prevailing later in spring than usual.

Reflowing was done about May 18th, and water left on a few days to permit another cold snap to go by.

In early June, it became evident that the Station had suffered from winter injuries, as the buds showed tardiness in opening.

June 8, 9, 10 and 11th, was one of the most severe June frost periods experienced at the Cranberry Station since 1903. The temperature ranging from 28 degrees to 22 degrees, with a result of a ten per cent frost damage on the Station, which was not flooded during this period.

We find that there was a marked effect of this period in all sections of the State, and that some damage to cultivated bogs was sustained in numerous instances. Indications are that practically all of the wild cranberries of the State, and a large part of the blueberry crop of the State was destroyed by this frost.

Early in May, we made a selection of six varieties of cranberries of from ten pounds each, and shipped to Europe one consignment to Denmark—(Nils Esbjerg, Director, Ribe Amts Nordre Landbrugs Forenings Have-

brugs Farsogsgaard) and one consignment to Germany—(German Pomological Society at Eisenach—Grandduchy of Oldenburg (Deutschen Pomologen Verein).

This latter consignment was solicited by the German Kali Works, while the former was solicited by Mr. Esbjerg in the fall of 1912, when he made a personal inspection of the Cranberry Station here and on Cape Cod.

The varieties sent were the Prolific, Early Ohio, Bennet Jumbo, Metalix Bell, and Late Improved Home: to both places, Denmark also getting some McFarlin vines.

The vines were tied in bundles and packed in a cranberry barrel, with moss,, some vent holes being made in the barrels.

Owing to not making close connection at New York with the steamer, these express shipments were about six weeks in transit.

The vines arrived mouldy but unpacking instructions were followed closely and planting done almost immediately, with a result that in September, we received reports that vines had made a fair start and but few cuttings would fail to grow.

Insects.

The fire worm did not appear this year until late in May, but both Blackhead and Yellowhead were found at work in small numbers but quite generally scattered.

Early in June, a leaf miner was found to be working extensively on one bog, at Elm Lake, and this was the first we had found since 1909, when we found this insect at work in the Berlin district. The insect has not been noticed to be doing extensive damage except in these two cases.

The insect is a flat headed worm, somewhat similar to the worms under bark of trees, but very small, it eats between the upper and under side of the cranberry leaves, giving leaves a brown or dead appearance. When the insect is mature, and through eating, it cuts the edges of this covering and seals them, and then drops to the ground in this improvised cocoon, to in a few days, emerge as a small fly.

The fact that this insect drops in its cocoon to the ground, to pupate, suggests that it may be at least partly controlled by flooding.

A small number of these insects were also found at work on an area of about twenty square rods on a bog in Burnett County, and as the crop on same was very light, a four day submergence was given the area. While we are not certain that we exterminated the insect, we could find no trace of them a few weeks later.

For similar insects working on Greenhouse flowers, such as Carnations, a nicotine spray is found effective and may have to be resorted to in severe attacks by this insect.

Growers should be on the lookout for this insect next spring, and look for the transparent round or oblong spot in the leaves. Growers should also be on close lookout for the Blackhead and Yellowhead fire worm next

spring, as they were very generally distributed the past season, and were very noticeable in the latter part of the season. The leaf miner can be seen by holding infested leaf to light, looking through with a pocket lense.

With nearly 1500 cocoons of the cranberry fruit worm, in several cages about the Station, we commenced early in the season to examine cocoon. We found a large percentage dead, but of the normal ones, we still had a sufficient number to give an exceptionally good data.

The first cocoons opened about the middle of May, contained the worm which after releasing from cocoon and warming up a little, became active. (May 8 to 20.)

About May 20th, there were signs of pupation but not until May 29th, did we find the first pupae, from then on, as we examined the cocoons it developed that the cocoons containing active pupae were in nearly all cases open at the pupae's head end, two or three days before the emergence of the adult.

The first miller to be observed emerging was on June 15th, (the date of first blossom observed this year). The fact that more than 70 per cent of the pupae containing cocoons, examined, were open prior to the pupae's emergence, is a strong indication that the judicious use of water at that season, so as to just cover the surface of the bog, this insect may be at least partly controlled by water, but it must be remembered that cocoons are found on the highest parts of the bog, and at about blossom time, so great care must be exercised in the use of water for that purpose.

Fruit worms' damage was not as extensive as in the two previous seasons, but there was however, considerable damage done. The first blossom on native vines in the Cranmoor district were found June 15.

The tip worm did not seem as numerous as a year ago, and although there was evidence of the work it did not seem so extensive.

No spraying was carried on, the past season, owing to unavoidable delay in getting ready for the first spraying, due to unfavorable weather, and delay in the arrival of some material.

Later indications were that insects would not be very plentiful, so that with ordinary seasonal weather, we would barely be able to save the price or cost of spray with scant definite results. Complexity in the labor problem in July also partially prompted the abandonment of a spray test for the season.

No new fertilizer tests were undertaken but from general observation marked effects of improvement from fertilizer used in past season was noted on several bogs.

Rock Phosphate on bare peat bogs shows marked improvement in vines and cropping the second season, but also proved a great stimulus to the gases on the areas treated.

Nitrates and Potash in other cases were shown to materially cause increased size of fruit together with improved color.

The season was somewhat unusual as far as frost was concerned, and for the first time in the ten seasons, did we use water after May 10th, for protection against frost, and suffered a slight loss in the June frost by not using water during severe frost.

We, however, went through the rest of the season, without flooding and even during the severe cold spell in September, we did not find it necessary to resort to water, for protection.

As in past seasons, vines in healthy condition planted alike, but later having portions sanded, showed marked differences as follows:

Yield in barrels per acre, on equal sized areas, with no sand, half inch sand, and one inch sand:

Plot	Qts.	Bbl. per acre	Size of area.
1. No sand	7	10.5	1-150
2. No sand	4	6.0	1-150
3. $\frac{1}{2}$ inch sand	14	21.0	1-150
4. 1 inch sand	20	30.0	1-150

Similar results have been obtained the four previous seasons' records.

Weed Killing.

Co-operative tests in weed killing gave results that substantiate the experience of past seasons. Iron sulphate when thoroughly applied with a good spray pump for killing wood moss, was very effective, but a 20 per cent solution applied with too little force from pump did not do as well as a 10 per cent solution applied in the proper thorough manner.

We do not believe that it is advisable to use the acid weed killers very extensively, as they kill everything and even on dams, this appears to be a poor policy as the bare dams wash considerably.

The State crop was much below that of a year ago, and was somewhat below normal, the cause can undoubtedly be traced to various sources, chief among which are large crop the previous season, the wet autumn of 1912, and slight damage by June frosts.

The Cranberry Station crop was very light, with only about seventeen barrels aside from some three or four barrels of samples that are in storage for later sorting.

Electric Thermometers.

An electric alarm used for orchard protection in the West was tested out the past summer. This was the Cederborg Electric Alarm Thermometer. This thermometer works on the principle of an electric current running through the thermometer, and keeping a circuit through alarm, open, until temperature drops below the point where alarm is desired, then when current is broken, the alarm starts ringing, and continues to ring until someone gets up to switch it off or onto a lower temperature.

The experiment included two thermometers each, with three contact points set four degrees apart. One being set at 42 degrees, 38 degrees and

34 degrees, and the other at 40 degrees, 36 degrees and 32 degrees. As it has been found that it is impractical to place contact points on these electric thermometers closer than four degrees, the above arrangement became the most satisfactory to obtain contact points sufficient to give an alarm, at intervals of two degrees from 42 to 32 degrees.

Recently we have received a loan of an electric frost alarm manufactured by the Taylor Instrument Company, of Rochester, New York. This alarm works in much the same manner as the Cederborg alarm just described, but the thermometer itself differs in some respects in that it is mounted in a metal case, instead of on supports standing out from a wooden back, and by this mounting, the metal case is a trifle more protected but the bulb exposure is not sufficiently free to warrant rapid drops of the mercury, when temperatures are dropping rapidly, near the ground where exposure is made. The alarm box of this "Tycos" instrument, which is a trade name of the Taylor Company, differs from the alarm boxes of the first described one, in that the current is thrown on to operate the working parts of the instrument by means of two buttons, as in case of wall buttons for electric lights, while the Cederborg alarm boxes are constructed with one central point to which an electric switch is attached and can slide in a circle to make contacts with practically any number of contacts, each of which would represent the return wire from one alarm point on outside exposure alarm thermometers. As for instance, upper point to right, when connected with switch would leave the alarm ready for action at 42 degrees, and when the temperature drops below this, would break the current, and thus releasing the relay in this alarm box, and would at the same time complete the short circuit running through the batteries to the alarm bell, mounted on box, and thus bell would continue to ring until some one came to throw the switch off contact point at 42, and either leaving the switch entirely off or moving down to the next desired temperature of alarm, whether it might be 40, 38, or lower.

In calling attention to this electric alarm thermometer the main point in mind is that the charges made for such instruments including also cost of wiring any distance from a few hundred feet to a mile or more, would represent but a very small investment as an insurance on the crop which is at stake, and when risked to the mercy of the frost.

Although quotations have not been received on the latter of the above described instruments, indications are that it would not sell at a much higher figure than the Cederborg instrument, and I am confident that for any ordinary distance, for a mile or less, the installation one of these instruments or similar ones, would not exceed \$40.00 to \$50.00 and in view of the fact that the principle upon which they are constructed is such that the principle upon which they are constructed is such that they can be absolutely tested as to their working efficiency each evening, when the current would be switched on, makes the instrument practically absolutely

dependable, with the possible exception that after continued use for a part of the season, it would be advisable to either test out the batteries, or replace same with fresh ones, to avoid any possible chance of a failure of current to operate alarm at the critical time, but if the switching on of the current of this instrument were made a regular chore each evening of the growing season, it would greatly facilitate the safeguarding of the crop, and would save the man in charge, considerable night worry and wakefulness.

Some very desirable cranberry recipes are attached, try them in the fall immediately after harvest and on your ripest fruit.

RECIPES.

Cranberry Conserve.

Chop coarsely 5 pounds washed cranberries and 2 pounds raisins. Add juice of 6 oranges, and 5 pounds sugar. Heat and simmer slowly until thick like jam. Put in jelly glasses.

Canned Cranberries.

Always wash cranberries.

Pack dry cranberries into pint or quart Mason jars, put on rubbers and cover and seal tight. Place jars in pan, kettle or wash boiler filled with water to reach up to neck of cans. (Place false bottom in the dishes used.)

After water comes to a boil permit pint cans to boil a half hour, or quart cans three-quarters of an hour, then take from water, and remove covers, fill cans with hot syrup and reseal. Set aside in cool place for two weeks before using.

Syrup is made as ordinary sugar syrup, figuring on one half pint sugar for each pint of cranberries.

For thinner sauce or more tart flavor, reduce proportion of sugar slightly.

O. H. Malde Supt
Madison, Wis., Jan. 9, 1914.

Mr. J. W. Fitch, Secretary, Wisconsin State Cranberry Growers' Association, Cranmoor, Wisconsin.

My dear Mr. Fitch:—At the request of certain representatives of your association for further advice as to the diseases of the cranberry, especially the so-called "False Blossom." I arranged for a visit of inspection last summer with Dr. C. L. Shear, the cranberry expert of the U. S. Department of Agriculture. As you probably know, Dr. Shear has made investigations of the Wisconsin cranberry conditions before and is thoroughly familiar with those in the East. Through the assistance of Prof. Malde, I had been able formerly to get somewhat acquainted with Wisconsin cranberry conditions and diseases. Since I cannot be present at your Association meeting to present the conclusions reached by Dr. Shear and myself, I am sending you enclosed a draft of the report which Dr. Shear joined

with me in formulating at the conclusion of our inspection trip.

Hoping that this may be of some service, as well as interest, to your members, I am,

Yours sincerely,

L. R. JONES,

Professor of Plant Pathology,

A Report Upon "False Blossom" and Other Cranberry Maladies.

Submitted to the Wisconsin State Cranberry Growers' Association January, 1914.

Cranberry culture in Wisconsin has reached a stage in the opinion of various experienced growers, where its continued success is conditioned to a great extent upon the understanding and control of certain maladies and particularly that known as "False Blossom." It is now some years since this latter disease was first made the subject of scientific study by one of us (C. L. Shear. Further observations and studies have been continued upon this since with the cooperation of O. G. Malde and G. L. Peltier. Finally at the request of certain members of your Association, we made, in September, 1913, an examination of various cranberry bogs in Wood and Jackson counties under the advice and direction of various growers and under the personal guidance of Professor Malde.

Inasmuch as we have had opportunity for personal acquaintance with cranberry growing sections of the United States, and one of us (C. L. Shear) has made a critical study of cranberry diseases and their control, we now feel qualified to advise upon the Wisconsin problems as follows:

Shear, C. L. Cranberry diseases in Wisconsin. Wisconsin Cranberry Growers' Association Report 1908:7.

Shear, C. L. Fungous diseases of the cranberry. U. S. Dept. of Agr. Farmers' Bul. 221. (1905).

Shear, C. L. Cranberry diseases. U. S. Dept. of Agr. Bur. Pl. Ind. Bul. 110. (1907).

Shear, C. L. Cranberry spraying experiments in 1905. U. S. Dept. of Agr. Bur. Pl. Ind. Bul. 100. (1907).

False Blossom.

1. False Blossom has never been observed in any cranberry growing section outside of Wisconsin.
2. The evidence indicates that under certain conditions this disease is perpetuated when diseased plants are used for propagation, but under other conditions it disappears.
3. There is no evidence that the malady is in any way whatever directly or indirectly due to the attacks of any parasitic fungus or insect.
4. On the other hand all of the evidence indicates that it is a physiological disturbance due to unfavorable cultural conditions.
5. This is further shown by the fact that the trouble does not occur in Wisconsin where the best cultural methods are practiced, and that where

diseased plants have been transferred to another locality and propagated under good cultural conditions, the disease has disappeared.

6. The most important factor for the elimination of False Blossom, and for increasing general productiveness, is proper drainage. Every cranberry bog visited where False Blossom occurred showed lack of sufficient drainage.

7. The practical conclusion reached is that in all these cases a radical change of cultural methods is demanded.

This involves the essential reconstruction of such bogs, including thorough drainage, rescalping, sanding, and replanting with healthy and vigorous vines.

Inasmuch as Mr. Malde is prepared to give detailed advice suited to local conditions, and since certain Wisconsin growers have already been using such improved methods with success, no attempt will here be made to give further specific directions.

In general, however, we would suggest the wisdom of concentration of effort upon smaller areas at the outset. Intensive culture by the most improved methods carries the key to success.

Other Maladies.

Although certain other diseases are found, none of these is a serious limiting factor, and all of them can be practically controlled by spraying or the other established methods providing the bog is properly made and managed as indicated above.

In closing we wish to thank the various growers who have assisted in these investigations. We also wish to assure the members of your Association of our continued interest in your problems, and of our desire to be of further service should occasion arise.

Yours sincerely,

L. R. Jones, Professor of Plant Pathology, University of Wisconsin
C. L. Shear, Pathologist, U. S. Department of Agriculture.

Scientific Cranberry Culture.

I have been asked to talk on the subject of Clean Culture and as clean culture is only possible under Scientific Culture I have changed the subject a little and shall talk a little about Scientific Cranberry Culture.

The word Scientific should not frighten anyone as it seems to. It should not be connected alone with books, theory and impractical knowledge. To be scientific in the production of cranberries means to secure the best results with the least expense. All cranberry men should strive to become scientific in this sense.

Science in the production of cranberries can only be obtained by thorough knowledge of certain laws of nature and by giving these laws a chance to work to their best advantage. If cranberry vines have a chance they will redeem themselves nobly but they are grown under such

severe handicaps in most places that they become quite discouraged; when under proper treatment their possibilities are often immense.

A thorough knowledge of the cranberry business is absolutely essential to success. That is the reason why we pay no attention to the wild-cat companies which are threatening to monopolize the cranberry industry. We all know that experience is the best teacher and in looking for information on cranberry culture we should turn to those who have been in the business for the longest time and who have made a success of it. We admit that Massachusetts is the greatest state in the Union and that the methods of culture used there now are the result of many years of experience. The successful cranberry men in Massachusetts are big men. They are th'inkers



Wheeling Sand on the Bog.

in addition to being workers and they haven't thought and worked under the spur of the healthy competition, which they have there, for nothing.

The result is, that the cranberry business in Massachusetts has developed into a high state of perfection and is carried on under scientific cultural methods. The reason is, of course, that it pays them to be scientific. Why should it not pay the Wisconsin grower to be scientific also? It is claimed by some that the conditions are different in this state than they are in the east. This is a very poor argument and has no foundation. The only difference between Wisconsin and Massachusetts in regard to cranberry producing conditions is the slight difference in climate. We have more frost here and must have a larger water supply per acre. We have a somewhat shorter growing season and a drier atmosphere but these dif-

ferences can be completely offset by the selection of a Wisconsin grown variety.

Scientific cranberry production in Massachusetts implies the use of sand and freedom from weeds; in other words, clean culture. It also implies adequate drainage and a plentiful water supply. A cranberry bog in Massachusetts is a beautiful thing to look upon. There, acre after acre of bog may be seen with the clean cut ditches and trim dykes and the wide expanses of vines unpolluted by weeds or grass. And the best of it is, these bogs when they possess the proper requirements and are managed right produce on an average of from 60 to 80 barrels per acre year after year.

Prompted by the nature of the cranberry business itself, by the opportunities for the business in the west and by a hunger for rock-bottom



Planting Vines.

information on the subject, I went to Massachusetts in 1910 to learn the eastern methods of cultivation. My purpose was to learn the best possible method of getting in a cranberry bog and then return to Wisconsin and put one in. After working at all the different steps of bog construction as a laborer and at the Cranberry Experiment Station at Wareham, Mass., under Prof. H. J. Franklin, I returned to Wisconsin, formed a company and started operations at a location near Spooner, Wis., in 1911. At this place we are developing what we hope will be a scientific cranberry bog.

The swamp was originally covered with a growth of grass, swamp laurels, some sphagnum moss and scattered tamarack stumps. A creek which winds thru the swamp is backed up by a dam giving us a good reservoir, controlled by gravity alone. Three feet of drainage were secured by a lit-

the cleaning out of at the outlet of the swamp. The swamp contained 75 acres available for planting.

The construction of the bog proper was as follows: The clearing of the land was the first step in construction. All stumps and logs were grubbed out by hand, piled and burned. A very careful survey of levels was taken of the marsh for the purpose of locating the ditching system to the best advantage and for determining the divisions of the fields. In determining the size of the fields the eastern plan of making the fields as



Weeding.

large as the level of the marsh would permit was followed. The advantages of large fields are; fewer dykes and flumes and less trouble in handling water. The creek was straightened and made into a main ditch and central canal ditches were dug leading to the various fields. Transverse section ditches were dug at intervals of five rods at right angles to the main ditch and central canals. By this system the entire bog was divided into sections five rods wide. A border ditch was dug around the edge of the high-land connecting the transverse ditches. All the section ditches and the border ditch were made three feet deep and two and one-half feet wide at the top with just enough slope to the sides so that they would "stand up."

With the completion of the ditching the work of grading was begun.

The marsh was high along the edges and low next to the creek. Instead of scalping the marsh as is ordinarily done in Wisconsin we removed the dirt from the high portions and filled up the low places, making each field almost perfectly level. We used a 16 inch breaking plow on the tough

sod around the high edges and cut these sods up with a turf-ax to suitable size for handling with wheelbarrows. By this process of grading we removed very little material from the bog, merely the roots, brush and heavy growth of sphagnum moss which was present in spots. By holding the water up part way in the ditches and keeping it level, an excellent guide was obtained for use in grading.

The bog was now sanded to a depth of four inches. Sand was present in the hills in great banks and sand holes were opened up at several points around the edge. Where the length of roll was under 50 rods wheelbarrows were used for distributing the sand. These were regular eastern wheelbarrows, made for the purpose and they must be wheeled on 2 inch plank. Where the haul was over 50 rods the sanding was done in the winter time with teams and the sand was spread 4 inches thick upon the ice. Under the latter arrangement the ditches were staked out before the bog was flooded so they would not be covered with sand.



Bird'seye View of Planting.

We planted about one-half ton of vines per acre. Several cuttings or pieces of vine, never under 6 inches in length were used in each hill. A hole was opened with a dibber, the vines placed with ends over the hole and pushed down through the sand at least one inch into the peat, and the opening pressed together. The planter works on his knees and plants three rows at a time. The rows were placed 14 inches apart and the plants 14 inches apart in the rows. The surface of the sand was marked up into checks for planting by using a wooden warker.

This marsh has been kept free from weeds to date. Seventeen across

were planted in 1912 and twenty-three in 1913. The 1912 planting was weeded three times in 1912 and three times in 1913 and every weed or piece of grass was carefully pulled out by the roots. In another year the vines should have control of the situation and the weeding expense should be slight after 1915.

The 40 acres planted thus far lies in four fields, separated by dykes of ample width to drive on. Where hard bottom can be reached concrete flumes have been constructed, the reservoir and outlet flumes being of



New Planting.

cement. Where hard bottom cannot be secured for a foundation, wooden flumes have been put in.

This completes the summary of the work done on the first cranberry marsh in the west to be built from the start on the eastern plan of scientific cultivation. To follow this method has necessitated the outlay of a large amount of capital. The heavy expense of good grading, unless the marsh is especially level, the high cost of sanding, the cost of vines and of dykes, dams and flumes will bring the expense to a high figure in comparison to what has heretofore been spent per acre in this state. But this is not an experiment. We are doing what has already been done before and we expect good results.

One point we are determined on; we shall not permit weeds to gain the upper hand at any time. We are out to show, if we can, that Scientific Cranberry Culture will pay as well or better in Wisconsin than it does in the east.

C. L. LEWIS, Jr., Manager,
Badger Cranberry Co., Shell Lake, Wis.

Chicago, Jan. 10, 1914.

J. W. Fitch, Secretary, Wisconsin Cranberry Growers' Association, Cranmoor, Wisconsin.

Dear Sir:—I have for acknowledgment your letter of December 23rd with your kind invitation to attend if possible your annual meeting at Grand Rapids on January 13th. I am not sure at this writing whether it will be possible for me to attend or not. I hoped that it would. While I would like very much to be with you I am very much afraid that I will miss, and am writing you this letter as an apology, and you have my permission to read it if you think it desirable.

In your letter you ask me to give you my opinion for the reason for retailers asking what seems to be an exorbitant price for Cranberries. In reply I will state.

First, That it's doubtful whether a salesman selling direct to the jobbing trade is really in position to judge without prejudice the actions of the retail merchants in demanding exorbitant prices. I, as everyone else, feel that in many instances they do.

Second. The retailer is not altogether to blame for these conditions. His customers are very critical, especially so in the exclusive neighborhood of a large city. Many of them never think of going to a store and selecting the goods themselves but depend entirely upon the telephone, ordering miscellaneously and frequently insisting on the merchants in calling and getting the stock and bringing it home again, thus increasing the cost of doing his business to a considerable extent.

The subject of the "High Cost of Living" has had a great deal of argument and a great deal of consideration from all parts of the United States, but to my mind none have as yet really solved the problem. In connection with the retailer's reasons for being forced to charge these high prices it will be necessary for me to give a few illustrations that have come to my attention here in Chicago.

Third. In addition to the conditions mentioned above that exist in a great many districts here in Chicago and probably the same conditions prevail in most other cities, especially so where the retail grocer does an extensive credit business. For illustration:

The Retail Growers' Association of Chicago have given out several interviews during the year that they were forced to ask exorbitant prices and demand higher profits on a great many articles because of the "dead beats" that their losses in bad accounts were so heavy that it forced them to add ten and even fifteen per cent to their profits in many instances to overcome this item alone.

Now, personally I feel that this is a very bad argument,—that real live merchants would be willing to sell for cash and there is enough good people everywhere to patronize a real live merchant who sold good goods for cash so that it would not be necessary to charge these exorbitant prices, but

nevertheless this is one of their statements, and I believe this particular feature could be overcome by publicity. To my mind it would be necessary, in order to prevent the retailer from asking too exorbitant a price, to organize a publicity bureau and this would undoubtedly cost considerable money and in as much as the jobbers everywhere in my opinion are handling their business at as low an average cost as it's possible, it would be almost as great a problem to know where to realize the funds for this purpose, but if the funds were available, without doubt, publicity would have much to do with preventing the realization of extreme prices, especially in the larger cities. While exclusive, fancy stores might still continue to demand and get exorbitant price, the stores that cater to the mass of people could not possibly realize more than a reasonable margin of profit and satisfy their customers.

Fourth. In this connection as stated above, I believe that in a measure a great many people themselves are responsible for the big increase in "Living Cost." Thousands of people in a big city some of them of very moderate means are very apt to want to appear wealthy, that they will order things over the telephone, when, if they themselves would visit the store, select what they want, they would be able to save a great deal in their prices and the "High Cost of Living" would not be so much of an increase as the daily press make it seem.

It has been my experience that in small interior cities, villages and towns, where there is any real live merchants at all, the bulk of the merchandise retailed is sold at a reasonable margin of profit, so that there is really no just cause for complaint on exorbitant prices, excepting in some of the larger cities and this is principally confined, I believe to the fancy retailer who prefers a small amount of business at an exorbitant profit rather than a large amount of business at a reasonable profit, and if this is true and these fancy dealers have enough trade who are willing to pay the price it's doubtful whether consumption would be materially affected by any change in present conditions.

The season just closed has been in many ways a remarkable one. The most unusual weather conditions that have ever been experienced has been encountered this year—unusually warm with many days of damp, foggy, unfavorable conditions. This undoubtedly had much to do with the poor keeping quality of a great many lots of berries this season, but it is gratifying to note that through all of these unfavorable conditions that the consumptive demand was very steady and covered a larger area of the United States than ever before, and while it is reasonable to expect a certain amount of increase in the production on account of new bogs coming into bearing, it is just as reasonable to expect a continued increase in the consumption of cranberries on account of our increased population, and especially the much wider distribution that the goods are now given, in my

opinion, will without doubt take care of all of the increase during the next ten years at least.

Very truly yours,
CHARLES SCHLOSSER, Chicago, Ill.

Advertising the Cranberry—C. M. Saecker.

Some few months ago, a lengthy article in the Wareham Courier brought out the need of advertising cranberries and mentioned many schemes for raising funds such as taxing each grower ten cents per barrel getting voluntary contributions, etc., etc. Near the end of the article was mentioned a very progressive grower on the Cape who had a lot of recipes for cooking cranberries, printed and put these little books in each barrel as the cranberries were packed.

Our Sales Company started the same scheme four or five years ago and we believe every Wisconsin grower religiously put a package of recipe books into every barrel and probably thought he had done his full duty toward a wider distribution of cranberries and therefore toward higher and more uniform prices also,

That there is no more effective means of increasing the use of cranberries than by getting proper cooking recipes into the hands of housewives, hotel and restaurant cooks is a foregone conclusion but to distribute these recipes is a problem not yet solved.

This fall a visit was made to a large grocer in Madison, who had just received a barrel of Early Blacks. After tearing out the head, he hastily grabbed all papers on top of the cranberries, tossed them into a trash barrel and stuck his hand down into the berries.

When asked why he didn't use the advertising matter contained in each barrel he answered, "There was no time for that, it was cranberries they wanted when they opened a barrel and even with additional help they could hardly take care of their orders.

Inquiry among other grocers brought out the same condition.

It thus seems that putting these recipe books in cranberry barrels only fills up the trash box and rarely reaches the ultimate consumer.

However, our experience at the State Fair this fall brought out the fact that there was a great opportunity to distribute advertising matter and especially these recipe books, for our display, made up as it was of a portion of cranberry bog, with three or four inches of peat and the berries hanging on the vines, aroused much curiosity, especially among the ladies and they seemingly welcomed the chance to learn the proper method of cooking cranberries. Mr. Malde wrote me that on the second day of the fair, he distributed over 3,000 of these books.

Our display this year was necessarily crude, owing to the short time to prepare. It consisted of dishes of cranberries of different varieties and three small sections of bog and it was the latter that got the attention. Many people who passed by did not know what we had in our booth, they thought they were gooseberries or plums and inquiries became so numer-

ous that the secretary of the Horticultural Society insisted on our getting some signs printed and even paid for them himself.

One great handicap on our display was the lack of advertising matter, available for immediate use either in the hands of the growers association or the Sales Company. A week before the fair we wrote Mr. Arpin for some advertising matter and he referred us to Mr. Chaney and when we wrote Mr. Chaney he in turn referred us to Mr. Arpin. So it turned out that there was no advertising matter and we had to have all signs painted even the names of different varieties. However, the Chicago office of the Sales Company saved the day by sending us a small box of cooking recipes and we used them as far as they would go.

This year, for the first time, the Horticultural Society had a building to themselves and they were so pleased to have a cranberry display that they offered us second choice position with as much space as we want if we wish to make a display next fall and can notify them in advance.

They seemed to welcome the cranberry display as part of the Horticultural interests of the state and spoke sadly of past experiences with the cranberry growers hinting that our association seemed very exclusive. It has been suggested that a similar display could be made at the Minnesota State Fair and other state fairs close by. It certainly is effective advertising and could be arranged at light expense.

Whoever got up that little leaflet of cooking recipes had an eye for business and if we can arrange for intelligent distribution it will mean increased demand for cranberries. We believe there is no Chef or Steward of a large hotel in the country who would not be glad to have one of these little recipe books in their kitchen near Thanksgiving time and we are sure they need it, too, for we have never seen a palatable dish of cranberries served at a hotel yet.

Increased production is the goal of Wisconsin growers. Increased production will mean lower price unless there be wider distribution; and wider distribution of cranberries will come as the result of effective advertising.

Chicago, Ill., Jan. 17, 1914.

Mr. J. W. Fitch, Cranmoor, Wis.

Dear Friend:—I wish if you have space left in the cranberry report that you would say to the Wisconsin Growers for me, that I feel that it is my duty to warn them of the danger there is of the spread of the Egyptian moth, to the state of Wisconsin. These moths for several years have been working down onto the cranberry vines in Massachusetts. They were first brought to that state by a person who imported a few eggs for the purpose of testing their webs as a substitute for silk in this country. They were left for a time on his window sill, someone raised the window and a few eggs rolled out on the ground. From a dozen eggs a large section became covered with this pest, and the state of Massachusetts has spent many thou-

sands of dollars trying to get rid of them, and may yet spend millions more. When I was on the Cape, I saw thousands of their cocoons almost within a stone's throw of the marshes. The present danger of their spreading to the Wisconsin Cranberry marshes is a million times greater now than it was for Massachusetts.

The female moth cannot fly which is the only hope there is of their ever being exterminated.

The silk worms feed on the mulberry leaves and its being confined to certain countries but this brown tailed moth seems to make itself at home anywhere. I hope Mr. O. G. Malde will interest himself in this matter and secure life size illustrations of this pest and exhibit them at our next meeting and also secure life size drawings of the eastern cranberry root worm, and all vines that have been planted be thoroughly inspected as soon as possible by some competent inspector.

We are on the great highway between the Atlantic ocean and the Pacific and we are exposed to all the dangers with which we are surrounded. "Eternal vigilance is the price of liberty."

Yours truly,

A. C. BENNETT.

Discussion and Business.

President Searls gave his method of preparing lime for the purpose of killing sphagnum moss. The air slacked lime did not seem to effect the moss much, so they got a car of screenings, spread it on a floor about four inches deep, wet it thoroughly, covered it with about six inches of the dry lime, then covered it over with a canvass, in a few minutes it will begin to steam, then take a shovel and turn it so that it will not burn, this reduces it to a fine mass, suitable for application to the bog. Mr. Searls also said that with sanding there must be sufficient drainage and that some bogs required more drainage than others. As the fire-worm works the last of May, June would be too late to destroy them by flooding. The vines can be flooded after the bud is opened for as long as two days if the weather is cool.

No remedy for tip worm as yet. It works from middle of June till August.

In regard to another kind of moss like wood moss and more woody than sphagnum moss. Mr. Malde called it a running moss for which salt or iron sulphate should be used.

Great care should be used to prevent the heaving out of young vines through early fall and spring freezing. They should be kept flooded.

In regard to fertilizers, potash did not show up well at the station, but did at Hoffman's at Mather. Acid phosphate was best at the station, it acts quickly. Rock phosphate helped the young vines in C. R. Treats bogs, but had no effect on old vines. On the S. N. Whittlesey bog acid phosphate did best, and the effects were noticeable for three years.

It seemed to be the general opinion that it would be possible to control the fruit worm on level bogs by light flooding, when the cocoon was opening.

The results of pruning had been very satisfactory. Vines should be pruned before they start, and a man can easily prune an acre a day.

In regard to future advertising President Searls appointed Mr. C. M. Secker, Mather, Wis., Mr. O. G. Malde, Grand Rapids, Wis., and Mr. C. R. Treat, Valley Junction, Wis., a committee to confer with the Sales Co., in regard to exhibits at the state fairs in Wisconsin and Minnesota.

By a unanimous vote it was decided to change the constitution so that the August meeting would come on the second Tuesday of August.

It was decided to accept the invitation of Mr. F. J. Hoffman of Mather, to hold the 1914 Summer meeting at Mather.

A Resolution inviting Mr. Frederick Cranefield, secretary of the W. S. H. Society to address the August 1914 meeting, was adopted.

On motion the committee appointed to confer with the Sales Co. in regard to purchasing additional land for the station was continued as the plans had not been fully worked out. J. W. FITCH, Secretary.

TWENTY-SIXTH ANNUAL SUMMER MEETING.

Cranmoor, Wis., Aug. 19th, 1913.

The Twenty-sixth Annual Summer meeting of the W. S. C. G. association was held at Cranmoor, at the State Experiment Station, on the Gaynor Cranberry Co.'s bog, with a good attendance. The morning was given to an inspection of the work of the state and which was very instructive. Mr. Malde had some of the pumps of his own design which seemed to be the most efficient yet made.

At noon the usual dinner was served by the ladies, Mrs. M. O. Potter, being in charge, and proved to be very bountiful and satisfactory repast.

The afternoon session was mainly given to the discussion of the future maintenance of the station. Dean H. L. Russell was present and spoke most encouragingly of the great benefits such associations were and said that the University did not wish to curtail the help to the cranberry people but that on account of so much other work they were called upon to do, it seemed that the cranberry people should share more of the expense, should provide a little to the station, of which the state's lease would soon run out and if possible arrange to make it self-supporting as is done in the East.

Mr. Malde told of the season's work at the station and said that the prospects were for a reduced yield as compared with 1912.

Mr. J. A. Gaynor spoke on False Blossoms.

In the discussion in regard to the station it seemed best to have the matter handled through the Sales Co. and the Presidented Mr. E. P. Arpin

Mr. S. N. Whittlesey and Mr. G. M. Hill, a committee, to obtain options on locations for the station and take the matter up with the Sales Co.

An invitation to hold the August 1914 meeting at Mather, was received from Mr. F. J. Hoffman.

J. W. FITCH, Secretary.

False Blossoms.

False blossoms can be found more or less on all of the cultivated cranberry bogs, but I have never found any on wild uncultivated native vines. In the vicinity of Mather and Warrens there are several bogs that are badly infested with this pest,, and two at least that have been practically ruined, and the owners are anxious to find some remedy that will lessen their losses from this source.

These false blossoms have very many of the characteristics of what is known in botany as proliferous blossoms. In order to get a clear understanding of these false or proliferous blossoms, one should know the nature of a blossom. Along the stem of every plant, in the axle or crotch of every leaf, buds will be found that are known as lateral buds. These lateral buds may, under certain conditions, grow out into branches, and under other conditions, and at certain places on the plant the lateral buds grow into blossoms.

The cranberry vine, like many other plants, has two methods of propagating itself. One is by seed, and the other by runners or sets. This last method of propagation is called the vegetative method, and the plant itself has to choose between these two methods of propagation. If the growing conditions are very favorable it will choose the vegetative method, because propagation by seed is rather uncertain, while the vegetative plan of propagation is by far more reliable. The false blossom is a kind of mongrel. It is half blossom and half branch. It is neither a true branch nor a true blossom, and a vine that has been under cultivation for a good many years, if planted in a rich soil, where it has good growing conditions will soon acquire the habit of relying almost entirely for its propagation on vegetative growth, and often the little buds that ought to grow into true blossoms incline themselves to the habit of the whole vine, and take on some of the characteristics of a branch.

This tendency in plant life is well illustrated in our potato. Our common potato is an underground stem, and this plant can propagate itself, as we know, from these underground stems, but in its wild state, one way of propagation was by seed. The stalks of this plant used to produce true blossoms that matured into a fruit known as potato balls, and we have some varieties yet that produce potato balls in considerable quantities; but as a rule, the cultivation of the potato has led that plant into the habit of neglecting to produce true blossoms from which the potato balls might be grown. and it looks now as if the time would soon come when our potato would cease to produce seed, and this same tendency shows itself in our cultivated cranberry vines when grown on a rich soil.

This might be illustrated in a great many ways, but it is probably sufficient, if I call your attention to the fact, that false blossoms prevail most on vines that have been under cultivation for many years, and that are far advanced from the wild state. It prevails most on rich bogs that have all the requisites for producing a heavy growth of vines.

I have seen lately a cranberry bog that was very badly infested with false blossoms. The young vines were not looking very thrifty. They had been severely rolled and heavily sanded, and looked rather scrawny, but the fact is from the time they were first planted, those vines all showed vigorous growth, and this tendency or habit was not eliminated by pruning or sanding. This vegetative tendency in the case of the potato, is so thoroughly established in most of the varieties, that you could probably do nothing that would force some varieties to produce a true healthy blossom, potato ball, and seed at the top of the vine, the same as it was produced by their wild ancestors.

O. G. Malde at the experiment station planted out a section of what he knew was true false blossom vines. The ground upon which they were planted was properly sanded and they had the best modern methods for growing cranberries, and yet nearly one-half of those vines continued to produce false blossoms. The true blossoms they produced showed that the vicious habit was only lessened. It was not wholly removed, and this vegetative method of propagation persisted after they were transplanted to conditions that would naturally lead to true blossoms.

I wish to call your attention to what I believe must be a fact, that the bogs that are badly infested with false blossoms will not produce true blossoms in great abundance, even on vines, that are not false blossom vines. The reason for this is that the vegetative conditions that produce the false blossom on a part of the fruit, has its influence in preventing fruit on vines that are not false blossom vines. It seems to me now, that about the only remedy there is for badly infested bogs is to burn the vines, and sand the bogs to a depth of about 4 inches, and replant with vines that are free from the false blossom habit.

J. A. GAYNOR.

LIFE ROLL.

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All varieties carefully graded, hand picked and well packed. Keepers of the state cranberry experiment station and nursery.

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WISCONSIN STATE CRANBERRY GROWERS' ASSOCIATION.

An organization having for its object: Improved quality of fruit, better grading and packing; extension of market; increased consumption by making known the wholesome and medicinal virtue and value of the cranberry and collections and publication of statistics and other information of interest and worth to all concerned.

The annual due of fifty cents (which may be sent in postage stamps), entitles one to all our reports, bulletins, crop estimates, etc., and a membership, it is believed, will be of intrservice and benefit to those in any way connected with the industry.

Any person paying above prescribed due may be admitted as a member.

Annual meetings on second Tuesdays of January and second Tuesday of August of each year at places determined by ex. com.

January 1913 report now ready for distribution and will be sent to all entitled to same on application to J. W. Fitch, Sec'y. W. S. C. G. A., Cranmoor, Wood County, Wisconsin.

READ THE FRUIT TRADE JOURNAL, WEEKLY.

The representative paper of the Fruit and Produce trade. Gives accurate market reports, prices and all other news of the trade from the principal cities of the United States, Canada, and foreign countries. Subscription price ONE DOLLAR per year. Sample copies on application.

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76 PARK PLACE

NEW YORK

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