Wisconsin State Cranberry Growers' Association. Forty-eighth annual meeting, Wisconsin Rapids, Wis., December 5, 1934. Forty-eighth summer convention, Wisconsin Rapids, Wis., August 14, 1934. 1934

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P E Bennett

WISCONSIN STATE CRANBERRY GROWERS' ASSOCIATION

FORTY-EIGHTH ANNUAL MEETING

Wisconsin Rapids, Wis.

December 5, 1934

FORTY-EIGHTH SUMMER CONVENTION

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LETTER OF TRANSMITTAL

To the Honorable Philip F. La Follette,
Governor of Wisconsin.

Sir: I have the honor to submit herewith in requirement of law, the Forty-Eighth Annual Report of the Wisconsin Cranberry Growers' Association.

Very respectfully yours,
Clare S. Smith,
Secretary.

Wisconsin Rapids, Wis., January 1, 1935.

MINUTES OF THE FORTY-EIGHTH SUMMER MEETING

Meeting called to order at 2:00 P. M., Tuesday, August 14, 1934, at Witter Hotel, Wisconsin Rapids.

Following the address of welcome by President Herman Gebhardt, the minutes were read and approved.

G. Nash and A. E. Bennett were appointed to draft resolutions of regret on the passing of Mrs. Andrew Searles. R. Potter and Chas. Dempse were appointed to draft resolutions of regret on the passing of Mrs. Ermon Arpin.

After discussions, motion was made and seconded to let yearly dues remain at $2.00 per year and to make an assessment of five cents an acre in order to clear up outstanding bills.

Speakers on the program were: A. U. Chaney, E. L. Chambers, and L. M. Rogers

Motion made and carried to hold the next meeting on the first Wednesday in December.

Meeting adjourned.

CLARE S. SMITH,
Secretary.

ADDRESS

By President Herman J. Gebhardt

It is indeed a pleasure to again meet the cranberry growers of the state of Wisconsin at this, our annual summer meeting, where we greet those who are pioneers or long engaged in the business, and welcome those who have more recently come into the work of bringing forth from the soil a fruit so highly desired, especially on festive occasions. Here we compare notes, relate our experiences, observations and failures and thus guard against mistakes in the years to come. It is true that experience is a great teacher. Yet a course in the school of experience is so long that its graduates are usually too old to go to work. Some may contend that the school has no college yell; others know that it has, that the yell is, "ouch".

Usually we are not all hit at the same time with the same thing or in like manner. An excessive use of water may prove highly injurious during spring vine growth, while another may suffer keenly for the want of it. One bog may be suffering for want of plant food; another may require heavy sanding to prevent excessive vine growth. A bog may require a deep summer drainage while with another it is quite imperative that shallow drainage be adhered to. Thus we learn through the study of plant life the better method of procedure, for the vocation of growing cranberries is one in which great opportunity is given to work with Nature. If there is one way better than another it is the way of Nature, yet she is not to be governed except by obeying her. Daily we pass by seemingly inconsequential things or perhaps see them not at all. Our entomologist and field men, knowing that Nature never proclaims her secrets aloud but always whispers them, are on the alert for these whisperings and thus guide us that our cultural methods may work out for a fuller and better crop.

In August, 1887, there was held at Mather the first annual convention of the Wisconsin cranberry growers. The purpose of their meetings that year was not only to enhance the spirit of fellowship, but the need of special legislation, and the forest fires were among their problems. Did they permit their imagination to picture our problems of this day and what we discuss here? They would wonder at our N. I. R. A. alphabet formations. Many of our expressions would be quite foreign to them as the leaf hopper, root girdler, black head fireworm, pyrethum spray and dust, leaf miner, propagation of Trichagamma parasites, water cure and clippers. Immediately they would recognize that 1934 has its cranberry growing problems.

The recent drouthy years have made it imperative that the country, as a whole, conserve its moisture by preventing rapid run off. The growers in the drainage districts have devoted their efforts to prevent rapid run off by encouraging the closing of ditches. A number of years ago at our summer meeting in Mather, a lady member got up and evidently having this subject in mind said, "Dam the ditches and ditch the dams". Well now, that idea was not so bad. It depends on

the viewpoint. She evidently wanted dams thrown across the drainage ditches. That would hold the water back. Then she would ditch or cast away the obnoxious dams and thus return the swamp to its natural state. It wasn't long after that when the two old political parties began carrying a plank recommending that women be granted the right to vote. Elsewhere growers have strengthened their present water storage facilities and pumps are freely used to pump back water used. In the Wisconsin Rapids district the river supplies their reservoirs when necessity requires.

The false blossom effect has been with us a number of years. Our efforts are being directed at removing the cause. It is now known that a vine once infested with false blossom never recovers; that the disease is carried by the blunt-nose leaf hopper. Remove the leaf hopper and the problem simplifies. Flooding at the proper time is highly beneficial and the 1934 season finds pyrethum spraying or dusting coming to the fore as a leaf hopper eradicator.

Electrically driven grass clippers are being freely used. It is still a debatable question as to whether the drouthy years have reduced the grass or whether such has been in consequence of several clippings during the growing season. Time and observation will determine this.

Undoubtedly the so-called blight or inability on the part of the vine to bring the blossom to the proper fruit form, makes a far greater inroad on our crops than the average grower is inclined to believe. The fruit worm likewise may be very destructive when berries are small and such loss not be especially noticeable. Perhaps we should make a greater study of this individually knowing that our bogs vary greatly.

The quarter-barrel shipping box seems pretty well established as to size and shape. However, the tendency toward higher prices may necessitate our giving thought for a substitute material other than wood. Those who participate on the program that is to follow will, no doubt, devote a considerable portion of their discourse to a discussion of these 1934 problems.

1934 CROP PROSPECTS

By A. U. Chaney

Mr. Chairman, friends: I know you are more interested in the crop prospect than anything else, and I am sorry that I can't give it to you very definitely. The Cape Cod Association holds their meeting on the 28th of this month and their Sales Company a few days thereafter, and the Association of the American Cranberry Growers of New Jersey holds their's on the 20th. Their estimates are being gathered now. There were so many small growers on Cape Cod who did not turn in their estimates last year that the Bureau of Crop Estimates in Boston has made a door to door canvass in Cape Cod of all those growing cranberries. They found that there are 2500

growers in Massachusetts and that they produced last year a little over 500,000 barrels. About 2000 of these Massachusetts growers did not turn in their estimates and most of these have from ¼ acre up to 2 acres each. They have been out of the calculation so long as to crops that their heavy crop last season fooled us. We hope this year that the estimate will be liberal enough. The growers of Massachusetts as a whole are very anxious to give us as correct estimates of their crops as possible, and that is also the spirit shown in New Jersey.

There was a meeting of the cranberry growers in New Jersey last week to discuss what to pay for harvesting cranberries. This meeting was quite well attended and by contacting each grower, we got a fair idea of their prospective crops.

Reports from various districts would indicate that the New Jersey crop will be somewhere between 70,000 and 100,000 barrels. As a preliminary guess it has been put at 85,000 for the State, but I think I would place it less than more. Reports so far indicate that bogs that are not regularly and well cared for, will probably produce less rather than more. The shortage is mainly on the Native Jerseys and Early Blacks. Howes seem to have less blight than did the other varieties. On the Cape, they had very hot weather early in July. The first seven days in July ran about 100 degrees every day and it was unusually dry. In August there was record heat in New York City. Apparently the Early Blacks suffered more than the late berries which I think indicates that it was the heat that caused much of the blight. They had a tremendous bloom. I have never seen the bloom better, and they were breaking full during that hot spell in early July with the promise of another crop like last year. The late berries have also suffered considerably.

Our guess is now that the crop of Cape Cod will be around 375,000 barrels. (Later proved to be 285,000.) That would give us 450,000 barrels for the two Eastern States. The Wisconsin Cranberry Sales Company estimate for their State is 50,000 barrels against 42,000 last year. That would give us around 510,000 barrels as against a little over 700,000 barrels last season. Along with that, we have an abnormal shortage of peaches and the small fruits, a short crop of farm crops, of apples and citrus fruits. The government estimates that the total crop of fruit is 20% less than last year. That ought to be a big help in the marketing of cranberries. It is unfortunate that we do not have 100,000 barrels more this year to market when the crop of other fruits is so short. Financial conditions of the country won't permit a price commensurate with the short crop. We could probably get as high a price if we had more nearly an average crop. When prices for a short crop get too high, the consumers substitute something else. None of us can tell you what we are going to get for berries, as we do not know. We are studying this problem very seriously. It is up to us to start a price, and I want you to know that when that time comes we will start it with the

idea of marketing the whole crop and getting its full value. We recognize the starting point as being exceedingly important in the final results.

We must make and build up our own market. The cranberry is such a small commodity in the whole fresh fruit consumption that it amounts to nearly nothing. That reminds me of something a friend once told me. He said: "If you think you amount to something—just stick your finger in a pail of water and pull it out and see the hole you leave".

I spoke to the members this morning about how little we are in the minds of the people to whom we sell. We furnish one-half of one per cent of all of the fresh fruit produced in the United States, and this does not include strawberries and raspberries, but only includes bananas, pineapples, apples, citrus fruits, peaches, grapes, pears and other tree fruits. We are so infinitesimally small from the dealer's point of view, that middlemen do not look upon the cranberry as an important commercial item. It does not make much difference to him whether he ever handles cranberries or not. We must, therefore, try to stabilize our market in order to make him an assured profit on our commodity in order to secure and retain his interest. We must create a demand from the consumer; when we create the consumer demand for the product, we keep the dealer interested. We must keep our product on display in all retail places before the people. How many people eat buckwheat cakes these days? How many dealers handle buckwheat flour now? Twenty years ago, we all had buckwheat cakes for breakfast in the winter!

During this depression, ask the commercial sour cherry growers what they are getting for their cherries which have not been advertised. We have held our place by advertising and cooperatively marketing our crops and we must continue to hold our place.

We know that we have a fine commodity. We should be selling 2,000,000 barrels of cranberries in this country. I am sure we have a potential demand for that quantity. How many men, women and children are there who have never eaten cranberries? We have got to keep after them, if we are going to prosper.

If we retail cranberries at 10c a pound it means the grower is getting $4.50 or $5.00 a barrel and you know what that means. We must create a demand that will consume our crops, and be retailed at 15c, 17c, and 18c and we must keep our demand ahead of our supply. Twenty years from now we will not all be here. I hope you will be here and will always have the cooperative spirit and recognize that you must always sell your fruit to the consumer. Dealers will handle it in accord with the demand you create.

If we are going to sell cranberries in proportion to other fruits, we will have to have a much bigger demand. I think there are 47 pounds of oranges for each man, woman and child; and over 2 pounds of canned Hawaiian pineapple for each man, woman and child in the country, but only one-half pound of cranberries! But, look at how

many million dollars have been spent in advertising oranges and canned pineapples. Now, what is your job? Think it over. Get the demand for a million barrels before the million barrel crop comes along.

BIG NAMES AND BIG FIGURES

E. L. CHAMBERS

Recently I attended a meeting of the International Entomologists of the Northwest held at Lake Itasca in Minnesota. After listening all day to the Canadian members and those from the states give report after report on conditions in their respective provinces and states, I began to understand the difficulty a newspaper reporter was having trying to cover that meeting. He had just remarked "Big names, big words, big figures, what do they all mean?" A scientist must use the language of his fellows to avoid interruptions during the discussion which otherwise follows when one uses local terms or expresses himself in popular terms which are not sufficiently specific to permit a common understanding. Such expressions as physiological disturbances, phytopathological conditions, etc., convey definite meaning, and using the Latin names for the genus and species eliminates any possibility of confusion by avoiding the discussion of two or three different insects for one. Speaking, for instance, of corn borers, we might have any one of six or seven different species in mind, the common stalk borer, the corn ear worm, two-lined stalk borer, or the European corn borer. Each of these having different habits, yield to different means of control, and consequently a common language must be used to avoid confusion.

While the word "grasshopper" is a long enough name in itself, the mention of the word conveys an image of an insect we are all familiar with from childhood. When we speak of Melanoplus, we are using the Latin name for a species of the grasshopper known as the red-legged grasshopper, but in some localities they call this insect the Rocky Mountain Locust. You have all heard of the seventeen-year locust, and you might be confused in the use of the term "locust", and if you tried to control the latter with poison bran bait as we do the former, you would be disappointed, because the latter is not attracted to bran and molasses, and even though they were attracted, they could not consume the poison since, instead of being an insect with chewing mouth parts, they have sucking mouth parts. In other words, they are stage names given to identify them from all others just as our pugilists adopt fighting names for themselves and actors and actresses select romantic names, believing these to give them more prestige.

In these days of reconstruction, or revival from depression or whatever we may determine this strange interlude we are passing through, we hear such big figures and have read them so much that we have come to use them in our daily conversation without even bat-

ting an eye. When we speak of a few billion dollars for relief we think no more of the size of these figures than we used to when we contented ourselves with hundreds or thousands of dollars. We speak of 500,000 species of insects being named and described in literature and it doesn't make any very great impression after hearing and reading in terms of millions and billions daily, yet when we stop to realize that we have as many kinds of insects as there are people in the city of Milwaukee, we gasp and wonder how we ever exist. Two and a half-million dollars were expended on grasshopper control by the government this summer and another million for chinch bugs, just two species of these 500,000 insects.

Mr. Chaney in his talk gave you some big figures that at first thought would indicate we have too many cranberries in this country, but when he continued to show how many folks still have none, and how few most folks actually consume in proportion to other foods, it is evident that your industry has plenty of room for expansion. When by calculation we find it would take the entire Wisconsin cranberry crop for two years in succession to pay for the million miles of chinch bug barrier material used last summer, we get some idea of what the control of insects costs. Conservative estimates of the annual losses from insects to all crops and to health was computed in 1924, a normal year, at a total of $1,590,044,500. These figures were tabulated as follows:

Staple crops	$829,419,900.00
Vegetable crops	64,894,000.00
Fruit crops	42,504,400.00
Nursery and greenhouse	7,737,200.00
Human disease	75,100,000.00
Live stock	140,389,000.00
Storage prod.	300,000,000.00
Forest trees	130,000,000.00

The fact that the size of an insect enemy does not have anything in particular to do with the damage that the insect can bring about is exemplified by the losses caused to the industry from false blossom, a virous disease which is spread by the very small leaf hoppers. The small size of these insects is probably one of the greatest factors which has enabled them to survive on this earth for millions of years, according to our biologists. When we consider the structure of insects and their strength, compared with their size, we readily understand why they have survived in such numbers as they have. We know, for instance, that a house fly can carry a match to equal which a man would need to drag a timber thirty-five feet long and as large around as his body. A flea whose legs are about one-twentieth inch long can jump as far as thirteen inches horizontally and eight inches high. If length of legs were the only factor involved, we should expect an athlete with legs three feet long to make a broad jump of at least seven hundred feet and a high jump of at least 450 feet.

There are two disease control projects that the Department of Agriculture and Markets is directing and which, also, runs into large

figures. One of these is the Black Stem Rust control project, which consists in the eradication of the common barberry, which is the alternate host of Black Stem Rust of small grains. This project, started as a war measure in 1918, has been continued since and during the past two years the work has been increased as one of the unemployment relief projects. Since the beginning of the campaign, more than 5,000,000 common barberry bushes have been located in Wisconsin and destroyed. We recently heard a Canadian discussing the Black Stem Rust situation in Manitoba express that they had developed a big acreage of wheat in that province and felt that they were going to have a very prosperous industry, when a serious rust epidemic broke out and completely wiped out their crop one year, and demonstrated to them the necessity of carrying on a barberry eradication program, if they were to continue growing wheat. Similar serious epidemics have occurred in Wisconsin on small grains and because of the fact that the spores are carried long distances, the government has taken over the project in the thirteen Northwestern Central states and has reduced the number of barberries to a point where serious outbreaks have not been able to occur. Taking advantage of the unemployment relief funds, the department has been able to speed up its control program here in the state by at least ten years.

Another project carried on by the department is the White Pine Blister Rust control campaign which has been under way in the state since 1915, and which is very much like the Black Stem Rust control project in that an alternate host plant is involved. In the case of Black Stem Rust, it is one of the species of currant or gooseberry. This project also was greatly aided by unemployment relief funds, making it possible to speed up the control work and at the present time, 86,000 acres of White Pine have been protected in Wisconsin by the eradication of currant and gooseberry bushes within infective range. If we are to continue growing White Pine, a native of this state and a tree which is best adapted to growing here and has the most uses, we must protect it by eradicating the currant and gooseberry bushes within 900 feet. Once the infection occurs in a White Pine stand, it can be prevented from spreading to other pine by simply taking out the currant and gooseberry bushes.

Probably the greatest insect control campaign that we have ever attempted here in Wisconsin was carried out during the past summer in connection with grasshopper control. More than 10,000 tons of ready-mixed poison were distributed in some thirty-five counties for this purpose. While the crops in many sections were saved, the insect was not brought under complete control and with favorable weather conditions another summer, we will have to expect another outbreak of even greater proportions than last summer, the area having become greater and the population having built up within the infested counties.

An insect which always appears in Wisconsin, but never has caused quite so serious damage to sweet corn and field corn as this summer

was the corn ear worm. This insect was responsible for infecting more than 50% of the early corn and the sweet corn. Canning factories were not able to use very much of the early corn for canning purposes to advantage and the late corn was also heavily infested, since the insect which usually contents itself with one serious generation a year, proved to be able to develop two and even three generations this summer. This insect, you will remember, is the cotton boll worm of the South, which does not over-winter in Wisconsin, and the infestation, year after year, depends upon the ability of the moths to fly northward from the cotton fields of the South.

FACTS AND THEORIES

By L. M. Rogers

This season Wisconsin cranberry growers have planted a total area of 93 acres. Of this amount 57 acres are new marsh and 36 acres are remade from unproductive area which is included in the flooding system. Five acres are set to Native, 23 to Howes, 25 to Searls, and 40 to McFarlin vines. Well over 200 acres have been resanded. With a good crop and good prices I think 500 acres would be sanded each winter. If this could be done it would mean sand for our entire acreage once in 4 years with assurance of increased crops.

A careful survey shows that 400 of our 2000 listed acres are winter-killed to the point of nonproduction in 1934. About half of this area probably will not recover sufficiently to produce a full crop in 1935 perhaps not in 1936, and some of it will have to be rebuilt. But for the zeal shown by the Cranmoor growers last fall in getting the river water, about 500 acres more must have gone into the two or 3 year injury class.

The cranberry girdler should not be bad this season as most growers kept the water high in the vines in late September in 1932 and 1933.

Spring frost injury was not very extensive although many growers were touched more or less where water was slow in getting on.

Blackheads, next to the fruit worm our hardest enemy to fight, have not been excessive. The hatching was early and the heavy floodings for frost may have killed many of them in some marshes. In others the cold winter no doubt sent some along with the potato beetle. The week ending June 9, the time most growers wished to make the worm flood, was very hot and submergence seemed risky. Under such circumstances it might be worth while to put on a six to eight hour flood, getting it on about nine A. M. and drawing around four P. M., leaving the water over the surface through the night, the idea being that the worms drop to the bottom and later revive when the water is off.

In very cold springs it might be well to hold the winter flood on until about April 25, if the weather is cool April 25 to April 30 the water could stay on until the 30th. I think the bloom or ripening of

the fruit would not be delayed by this method and a more even advancement might be expected. If a hot spell should occur about April 20, the flood should be drawn as the fruit buds might start under water, this would mean, either a bush without bloom or a bloom so weak it would "blight". I would not advise this method on marshes that have a tendency toward "Leaf-drop" although it has not been proven that "Leaf-drop" occurs after the ice is gone. In using this method, if there is plenty of water it may be drawn for a few days about the middle of April or earlier if it is safe to do so.

In Massachusetts many growers let off the winter flood April 1, reflood April 25 to May 1 and draw May 20. Good results follow with little backening of the harvest. Fruit buds there do not often start under the flood before May 20 as excessively hot weather does not occur before that date.

When I first came to Wisconsin I was often asked "Is it better to plant on sand or peat"? I didn't really know but said I thought there were very few marshes here that were suitable to be planted on sand for clean culture. After five years observation I think the same, i.e., that only those having very coarse free sand and good drainage should attempt clean culture.

About 1880 when the cranberry industry was booming in Massachusetts and spreading from Cape Cod into Plymouth County the method of planting was pretty well standardized. Most growers planted on 18 inch squares, a few on 20 inch squares. On rank growing bottoms little difference was noticed between the 18 and 20 inch method at the end of three years. Later when scoops came into use it was found that the spaces between hills especially where the sand was very coarse did not have sufficiently strong roots to hold the vines. Resanding was not much in use at that time. Double setting, a hill in the center of each square, was resorted to. Other distances also were tried, some planting on 16 and 14 inch squares and some on 12. A few planted on a 9 inch square. By the Massachusetts method of setting all selected hills the latter seemed prohibitive in price at that time. I understand a considerable part of the planting in Massachusetts at the present time is on a 12 inch square with one in the center for the triple purpose of strong rooting, quicker crops and less weeding. That would be a larger number of hills to the square rod than the 9 inch squares. The cost or contract price in Massachusetts for planting is usually 10 cents per 121 hills. One hundred twenty-one hills make a square rod 18 inches apart on a square. At that price the cost of planting an acre 18x18 inches is $16.00, and takes 200 to 250 pounds of vines. The cost of planting 9 inches by 9 inches would be $64.00 and would require about 800 pounds of vines. Planting 12 inches x 12 inches with one in the center would cost $72.00 and take 900 pounds of vines. Planting 6 inches x 6 inches, as is generally done in Wisconsin, would cost 9 times as much as at 18 inches, which would be $144.00. The amount of vines would be 1800 pounds. Formerly about 6 inches of free sand was used for the purpose of

keeping sprouts from coming through from the roots left in after grading, to keep down vine growth, and maybe some from custom. In later years less sand was used at planting, and with a good re-sanding the second or third years or both, good results were obtained.

In Wisconsin about 2 inches of sand is used that vines may grow rapidly and get possession ahead of the weeds. Planting through sand with a dibble for clean culture might be more desirable, but for the great amount of frost heaving. Some seasons, vines one, two and even three years old are badly heaved. Those planted through sand with a dibble show much more damage than those planted on peat with a stamp. The worst heaving occurs where vines are planted in wads by the dibble. Instead of a dozen pieces standing upright there should be half of that amount set in a sprawling position each part below the surface touching the sand or peat and not much of the vine left above the ground. Long vines sticking up in the air throw off more moisture than the tiny new roots can take up. In most marshes I think best results are obtained by planting on peat with the multiple blade stamp. Better work could be done with the single blade if enough time were taken. Usually where the single blade is used there are many vines left on the surface that are wasted. In planting through sand with the single blade I do not like the method of making the rows all one way, it gets too many vines in one place with the tops in the air.

Growers have now very well demonstrated that bunch and slough grass can be killed by the use of fuel oil without much injury to the vines. My tests show that No. 3 oil is quicker and more effective than No. 1. Too much oil will kill the vines while too little will not kill the weeds. The proper amount cannot be stated. It is obvious that for a bunch grass eight inches in diameter it will take much more than for one two inches. Growers using oil soon learn how much to apply. It seems that the best time to use oil is in September and October. April would be all right except that it is usually too wet at that season. Little harm is done by treating in summer if the bunches are scattered, as there is no need to get much on the vines under those conditions. Various weeds having a crown near the surface of the ground can readily be killed with oil. Wide leaf can be killed but more than one application is necessary as part of the plant is underground in October getting ready to come up the next season. It can be treated in summer without much vine damage. Ferns seem to have resistance to the oils similar to the vines. Where there are large quantities of ferns it is not an easy matter to get rid of them. On scattered plants dry Sulphate of Iron placed carefully on the roots is often successful. Where there is an almost solid stand it can be killed by spray. To make a good kill work should begin as soon as the ferns show abundantly. Four applications will likely be necessary. The first two should be one to four by bulk, i.e., one quart Sulphate of Iron to four quarts water. The third, 1 to 3 or stronger and the last all the water will take up. Wet thoroughly

no matter if some runs of the ground. It is better not to use Sulphate of Iron Spray on a hot dry day as the mixture crystallizes before it can penetrate. Some injury to vines may result but recovery is quick. Saturating the soil with a strong solution of Sulphate of Iron is being tried by Mr. Guy Potter, and may prove better than either of the above mentioned methods.

By the use of clippers and the aid of the past dry seasons and cold winters about half of the weeds in Wisconsin marshes, it seems, have disappeared. With good drainage and a generous use of oil in the next few seasons to clean up the bunch and slough grass Wisconsin should have a lot of nice looking marshes. We already have many fields that are second to none in looks or production.

IN MEMORIAM

It is with sorrow that we record the passing of Mrs. Andrew Searles who with her husband, the late Andrew Searles, were among the pioneers in the cranberry industry. She will be remembered as a loyal helpmate and an inspiration to her husband and family, a kindly neighbor and a true friend. This Association extends deepest sympathy to the surviving family. And be it

Resolved: that we record this expression in the minutes of this meeting.

A. E. Bennett,
Guy Nash.

IN MEMORIAM

This Association expresses deep regret and extends heartfelt sympathy to our esteemed fellow grower and member, Mr. Ermon P. Arpin in the recent loss of his beloved wife. Be it

Resolved: that we convey to him our expressions and include a copy in the minutes of this meeting.

Roy M. Potter,
Chas. Dempze.

MINUTES OF THE FORTY-EIGHTH ANNUAL MEETING

Meeting called to order at 2:20 P. M., December 5, 1934 at the Realty Hall, Wisconsin Rapids.

Timely and interesting talks were given by President Gebhardt, E. L. Chambers, A. U. Chaney, Capt. Nash and V. Goldsworthy.

Minutes were read and approved.

Financial report was read. Capt. Nash and A. E. Bennett were appointed as auditors. Moved and seconded that the financial report be accepted.

Moved and seconded that the secretary send out bill of dues and amount assessed to each grower.

Moved and seconded that subscriptions to *Wisconsin Horticulture* be renewed for all paid-up members of this Association.

Motion was made and seconded that resolutions be made and a committee be appointed to carry out the desire of this organization, viz.: that we do want a continuation of our $5,000 yearly appropriation for field work, and that the work be carried on under the same department as in the past. C. L. Lewis as chairman, Guy Nash and A. Hedler were appointed.

Motion made and seconded that the rules be suspended and a unanimous ballot be cast for re-election of all officers for the ensuing year. Carried. Meeting adjourned.

The annual 6:30 banquet at Witter Hotel followed, ninety-seven cranberry enthusiasts attending, with H. Lathrope acting as master of ceremonies. A rising vote of thanks was given to L. P. Daniels for the splendid musical program during the banquet, and for the dance an orchestra was provided for the later evening entertainment.

CLARE S. SMITH,
Secretary.

ADDRESS

By PRESIDENT H. J. GEBHARDT

If the 58,000 barrels of cranberries produced this year by the Wisconsin growers were made into cranberry sauce, it would make approximately four and a half million quarts. I am wondering what the reaction would be if all those who took part in the consuming of this vast quantity of sauce or jell were to peep in at this group and were to know that we, together with a few absent members, brought forth from the soil the little red, tart berry so appetizing to them. And with many, their astonishment would be greater when they learned that we used neither tree, shrub, nor bushes upon which to grow this fruit. Although the cranberry is the last of the berries to bloom, last to get ripe and the last to be consumed, the fact remains that it is the one berry demanded nationally on the last of the yearly festivities. Let us then call the cranberry the "National Berry."

The light crop in Massachusetts and New Jersey, together with the scarcity of fruit and vegetables due to the drouth and other factors, made prices seem almost extremely high. Perhaps some of you may hold that there is danger in extremes; that a reaction might be detrimental. Nevertheless, your crop was not brought forth without a struggle. We again experienced a very hot drouthy growing season followed by the unusual experience of having six August frosts in ten nights. Blight and water-injured berries reduced our yields. As we experience these aggravations, our efforts are directed toward preventive measures,—better and more reservoirs, clean culture, insect control, and other factors that tend to bring forth a better and fuller crop. Success with man comes with experience or otherwise. How different with the honey bee. Bees have no book learning, but you never saw one that wasn't an expert. How interesting the work of the entomologists who study the life and habits of expert creatures. As we meet these problems and changing conditions that confront us from year to year, we, too, can tend toward expertness in the art of growing cranberries. As we acquire definite, positive knowledge, we eliminate fear, which goes with uncertainty and our acquired knowledge establishes confidence, and confidence is the keystone in the foundation of success. There is no terror greater than our own fears. Nevertheless knowledge is like timber, it should not be used until well seasoned.

Our present marketing conditions together with sugar being at or below the cost of production with other factors, should create an optimism for the future welfare of the cranberry business.

I am glad to greet you and extend a hearty welcome to all. I hope you will enjoy the program that is to follow.

THE CRANBERRY FUTURE

A. U. CHANEY, *Sales Manager*, American Cranberry Exchange

I was interested in your President's address and heartily agree with him in saying that as the years go on we will not only increase our cranberry crop but increase our knowledge of cranberries as well.

I remember the first time I attended an association meeting. I thought myself quite a man, of course, but in reality, I was only quite a boy. I was in my twenties and Mr. Gaynor told me all about the cranberry business. I took back the knowledge of cranberry growing; I was enthused by the cranberry business from that time on. There is a future for young men and women in the cranberry business. We are only in its infancy. We will see a time when double the amount of cranberries will be produced in this country. This year cranberries sold at a good price due to the primary drought but older men know that every year is not like this year. Yet I hope you feel that there are possibilities.

I do not know of any other agricultural field that has possibilities so great. We've got quite a business, but when comparing the volume per capita with other commodities we are very small. People in this country raise about two hundred twenty-five pounds a year per capita, and we produce less than one pound of cranberries per capita, based on the testimony of fruit growers and the number of people that eat and like them. Yet most people do not know what they are. These people must be educated to like them, and educated by you and by me that they are good to eat. If we would produce the amount of cranberries produced in the East, we would have less than two pounds per capita, so there is a great future for the cranberry industry. Let us leave feeling that, and go forward with that in view.

You have been told today that you would have bad years that would bring about bad results. We are benefiting today from the big crop of last year. We are spreading abroad the idea of eating cranberries, to people that could never afford cranberries before. Some people say that they can't sell tarts because the poor people can not afford to buy them. Yet, you can go in to any store and the poor people are the ones that are purchasing cranberries. This year you can go in to any part of any city and you will find cranberries everywhere, and they are selling from fifteen to twenty cents a pound. When you stop to figure out that one pound of cranberries makes two and a half pounds of sauce, and sugar at six cents a pound, it is cheap food even at twenty cents per pound for cranberries—two and a half pounds for twenty-five cents and it's better than any other food. There are many opportunities before us; we are the manufacturers, it is up to us to sell them and to educate the people to eat them. Much educating had to be done to make people eat oatmeal, shredded wheat, or grapenuts—it took millions to teach people to eat these products. And ours is a much better article. We, ourselves, are certain of this but we've got to convince other individuals of this, and we must do it together.

I suggest that you build up a spirit of co-operation, to build it for the product, a demand for a million barrels of cranberries, and I hope it will be in your time and in my time.

SOME OUTSTANDING PROBLEMS OF THE YEAR

By E. L. CHAMBERS

Because of his duty and training, an entomologist always looks for trouble. It is a generally accepted doctrine that when one looks for trouble he usually finds it. In looking for cranberry pest troubles we find no exception to this rule. Before entering into a serious discussion of our troubles, however, I wish to talk to you for a few minutes on the pleasanter side of your industry. In the first place, it is rather difficult to believe that we are looking into the faces of the same group of folks that I have the privilege of doing today, that I confronted last winter at this time. There is something about the expression of their faces, Mr. Chairman, that makes them look like a different crowd. I believe I know the reason, however, and I want at this time, to congratulate you on being able to market a bumper crop of berries this fall at unusually good prices. We perhaps should extend a vote of thanks to the states of Massachusetts and New Jersey for giving us this break. The most credit should go, however, I believe, where it belongs and that is to your marketing organization and Mr. Chaney for their efficient advertising campaign, and the excellent manipulation of the market.

We know of no other crop that has been marketed with near the success as has the 1934 cranberry crop. One needs only to compare your industry with the potato growing industry and the cheese market, two outstanding industries which receive much attention from the state because of their importance, and you will find just the opposite situation regarding a market. The cheese marketing situation has become so acute that the cheese producers are now considering a sales tax on milk and dairy products to raise revenue sufficient to promote an advertising campaign stimulating the demand for the enormous surplus of cheese, patterned after the New York plan which is said to have resulted in a $500,000 advertising fund during the past year. I cannot help but feel that since advertising has been demonstrated as being so helpful to the disposal of your 1934 crop, a product which is usually considered as one of our industries, that some plan should be worked out by which every grower would be helping to pay this advertising bill, without its being necessary for the state to collect a tax for this purpose in order to make it equitable.

Speaking on a subject out of one's line is getting to be quite a fad nowadays, so I think following this procedure, I might suggest some methods of advertising that I believe would be worthy of consideration. We have always felt that Wisconsin folks should at least know more about cranberries than they do and thus not only would the local market be developed a little better, but once informed, Wisconsin folks would make good missionaries for the industry when traveling about. To our surprise in talking to folks we contact, we find very few of them have seen a cranberry bog or know whether

they grow on vines or bushes. We have noticed at the State Fair when exhibits have been put up by some of you people that the folks going through the exhibit building always manage to take time enough to stop and study the cranberry exhibit. It occurred to me that if advertisements carried pictures with them of harvesting they would attract general attention and would stimulate interest in reading and thoroughly studying the advertisements. Advertising experts tell us that if you put a recipe in an advertisement, every woman will read it but it takes a picture of something to eat or drink, like a cranberry pie or a cranberry cocktail, to attract the eyes of the men readers. Most folks still believe that cranberries grow on trees as they used to think that cranberries were only useful when served with a turkey during Thanksgiving. Through the power of advertising you have demonstrated more and more uses of cranberries and brought out the health value as well. The State Department of Agriculture and Markets is preparing a pamphlet on the industries of Wisconsin and we have succeeded in getting the cranberry industry included, and we will pass around some of the pictures we have had taken from which illustrations will be selected. If your bog does not seem to be included in this selection, it is because the photographer did not happen to locate your bog in search of what he felt were representative scenes. Our photographer has also taken several hundred feet of moving pictures of the harvesting which we hope to have edited and released to newsreels for nation-wide showing and also create interest of the regular newsreel photographers who are in search for just such educational pictures as this. What better advertising could we have than a Wisconsin harvesting scene shown in colors with a few suggestions included as to their use, by showing in the finale a dinner table with everything from the cocktail to cranberry pie ready for the guests. We believe that your exhibit at the State Fair has demonstrated you have a fascinating industry, since it always attracts the attention of the newspapers and is written up as one of the features in the Chicago and Milwaukee papers. Mr. Chaney's office has certainly given a good account of itself in advertising your crop with the funds at its disposal and I could not very well pass up this opportunity to urge you to keep up the good work.

Now to return to the subject which I am supposed to discuss, I wish to state, in the way of reporting progress, that our records indicate that 175 acres of cranberry bogs have been planted in the state during the past two years. As you know, some of our growers have found it neccessary to tear out plantings they made several years ago just at the time they should be coming into their prime, because of false blossom appearing in such a large percentage as to make their continuance unprofitable. We want you to take advantage of the services of your specialists, Mr. Rogers and Mr. Bain, and plant only vines that they recommend, after they have made careful inspection. The state nursery inspection law, as you know, provides

that cranberry vines cannot be sold, offered for sale or moved until they have been inspected and certified as being apparently free from dangerous insect pests and injurious plant diseases. The law also requires that application must be made prior to June 1 to avoid the possibility of having to pay, in addition to the initial license fee of $5.00, the traveling expenses of an inspector from the nearest point that his regular route brings him and return. We wish, also, to remind you that it is impossible to depend upon spring inspection entirely. If any of you plan to dispose of any of your vines for propagation purposes, you should notify our office in order that we may see that you are given the required inspection.

Cranberry bogs not having at least a trace of false blossom are almost unknown so that the vines must be certified as being reasonably free from this disease. While the Eastern states credit Wisconsin with being the original home of the false blossom, we wish to remind you that this state has a quarantine regulation covering vines from the Eastern states. This quarantine, as you will remember, was an outgrowth of a hearing held on this subject several years ago, and it was decided that no vines should be allowed to come into the state from the Eastern states where more than one-tenth of one per cent of the virus disease is present unless under a special permit. Where a trace of the false blossom may already be present in the vines before they are planted, the ability of the growers to control the insect vectors of this virus disease, the leaf hoppers, governs the length of time a cranberry bog remains profitable today.

As Mr. Chaney brought out in his talk, the Wisconsin cranberries are normally superior in their keeping qualities to those from other sections and this means much toward your success. While our records indicate that there are some twenty-five fungi causing storage rots, ten of which are of decided economic importance, our troubles can be attributed largely to just four of these. You know them, perhaps under their popular names of end rot, bitter rot, early rot and black rot. Contrary to the general opinion, these rots, our specialists tell us, make their appearance in the bogs as early as July 15, and we must not allow ourselves to become over-confident about this superior keeping quality of our berries. With the right kind of conditions, these may prove a real menace and blight the hopes of the most promising crop. That is why you need your specialists.

We are glad to be able to report that the Black-headed Fire worm without any doubt, which is the most serious insect pest here in Wisconsin on the cranberry bogs, seems to have been kept pretty well under control the past two years. It is generally conceded that the insect pests alone take, on an average over a period of years, 25% of the crop. If your tax to the state amounted to anywhere near the tax taken by these insects, there would be considerable concern. The state returns to us services in the way of roads, schools, etc., for the taxes paid, while these particular insects give you nothing in return. You should follow the suggestions of your specialists and

reduce these losses which, in turn, would better enable you to pay your taxes to the state, since you would not have to divide as much of your revenue with the insects.

There are two insects this year which caused serious losses throughout the state that for some reason were kind enough to stay out of the marshes, but which usually become serious pests there when they occur in as large numbers and as wide-spread as they were this past summer. These insects were the army worms and cut worms. Not only were the cut worms more abundant in limited areas throughout the state this summer than they have ever been in the history of the state, but the infestation has been more widespread. In addition to this, not being content with one generation, there have been as many as two or three generations which required drastic poisoning campaigns to bring them under control. The army worm, which is really just a species of the cut worm, and derives its name from its habit of traveling in armies, likewise, never appeared so widespread as it did during the past season nor did it appear in destructive numbers in two generations as it did last summer. The army worm made its appearance two or three weeks earlier than usual, making it possible to stage two attacks, both of which we were fortunately able to bring under control speedily because of the fact that quantities of poison bran mash were available over the entire northern part of the state where these pests were most serious and could be used for this purpose.

You may be interested in knowing that during the past year the grasshopper control problem was the most outstanding insect control campaign that we have ever staged in Wisconsin. More than 10,000 tons of poison bait were required to check the ravages of this pest. Had it not been for the fact that in co-operation with the University of Wisconsin we were able to develop an economical formula made up of whey, sawdust and sodium arsenite instead of the more expensive ingredients, bran and molasses, we could not have met the situation because of lack of funds. The State of Minnesota expended more than $250,000 of its state funds to meet their problem, using the bran and molasses formula, while here in Wisconsin we spread a greater tonnage of bait and did not expend $20,000 of state funds. The U. S. Department of Agriculture co-operated to the extent of furnishing 2,000 tons of ready-mixed bran bait and 45,000 gallons of sodium arsenite. The state spent its money in the purchase of sodium arsenite and white arsenic. More than fifteen carloads of these poisons were distributed to some thirty-five counties in the state.

In answer to the frequently asked question whether we will have another grasshopper outbreak next year, we wish to explain that with similar weather conditions, all indications point to even a more severe outbreak than last summer. The poison distributed was used to protect crops until they could be harvested, after which the farmers did not concern themselves with destroying the few remaining grasshoppers. These are the ones that lay the eggs which over-winter and

give us our trouble the following year. A survey has been made of the entire area and using the same measuring stick that the other states in the Northwest are using to determine their needs next year, we will need practically the same amount of poison as we did last spring. With a favorable winter for our crops, having lots of snow followed by a wet spring, the grasshoppers probably would not do serious damage, providing the natural enemies continue their good work in reducing their numbers.

One other point we wish to discuss before closing and that is the question of your state aid. In talking to the growers, we are convinced that all of them are anxious to have the service the department has been directing through Mr. Rogers continue. There seems to be some misunderstanding on the part of the finance committee as to the wishes of your association and we believe it highly desirable that your legislative committee arrange to place your wishes before the Legislature and that a definite appropriation should be requested if you wish the service continued, since there is some indication that the present budget will have to be reduced. Since there seems to be an understanding in the budget director's office that the cranberry growers prefer to take care of their own specialists' service, it would be best to make sure that some definite sum is set up for this purpose. When your committee made a request for the appropriation in 1925, it was supported by the entire Legislature without a single vote in opposition. We believe that this is sufficient evidence that they realize the importance of your industry and that they recognize its value in utilization of otherwise useless land, and the fact that it places this land on the tax roll, making a difference in valuation of a good many thousand dollars. They, also, in these times appreciate, we believe, the enormous number of people employed in connection with the growing of your crop and the fact that you utilize a considerable quantity of local White Pine in the boxing of your crop.

We, as representatives of the Department of Agriculture and Markets, wish to assure you that we are more than glad to continue the administering of such aid as you feel the Legislature should give you. We wish to also assure you that our interests in your industry are such that we would have no objection whatsoever to your having some other department or state organization administer this service, providing it was to the best interests of your organization.

1934 INSECT CONTROL IN WISCONSIN

By Vernon Goldsworthy

Spraying in 1934 has gained more importance in Wisconsin cranberry culture than ever before. Spraying was carried out for both insect control and to prevent fungus diseases of cranberries.

The chief insects in which spraying was used to gain control were the cranberry leaf miner, fireworm, and the blunt nose leaf hopper, the only known carrier of cranberry false blossom. In controlling the

leaf miner, a nicotine spray was used at the rate of one to five hundred plus one gallon of a soap spreader for each one hundred gallons of spray material. The material was applied at the rate of three hundred to four hundred fifty gallons per acre, depending upon the thickness of the vines. Practically all of this work was carried out at the Cranberry Lake Development Company, where a large acreage was sprayed with exceptional success. Control gained seemed to be about 99%, which is certainly much better control than can ordinarily be expected. The cranberry leaf miner is abundant on some northern marshes and has done considerable damage to the leaves because of the feeding by the larvae in early spring. The plant uses the old leaves in early spring to manufacture food and if the leaf miner destroys part of the leaf area, the normal function of the plant is interfered with to a marked degree.

Fireworm did not seem to be as abundant last year as it has been at times in the past. Even though it was not as plentiful as it has been, it still was in evidence enough on some marshes to make flooding and spraying a necessity. Some growers flooded with good results while others sprayed. Spraying for the fireworm, if done thoroughly and at the correct time, will give very good results. It has the decided advantage of being, as a rule, less injurious to the vines. For example, if you have a section with only an infestation in a small part of it, you can spray for this particular area and not have to flood the entire section or perhaps several sections with the possibility of the loss of the fruit of the whole section or sections. In spraying for fireworm, the best control is obtained by spraying for the first brood, because the first brood worms come out almost all about the same time. Anyone who wishes to spray for fireworm must watch very closely the hatching of the first eggs and apply the first spray as soon as the first worms are noticed. After this two or three additional sprays must be put on at three or four day intervals to procure a good control. It seems that nicotine sulphate or black leaf 40 is the best contact insecticide for the black headed fireworm. A soap spreader should always be used with a nicotine spray, as the soap helps liberate the nicotine sulphate because of a chemical reaction. In selecting a soap for a spreader always be sure that you are selecting a spreader that has non-caustic properties, or else burning may result. Here, I wish to add that if the day is very hot and the sun extremely bright, burning may result from even the use of clear water, so great care must be taken in the application of spray material on hot days. When a hot, bright day occurs, spraying should be done early in the morning, and in the late afternoon.

No doubt the most universal method in Wisconsin of controlling the cranberry fireworm is by water and the utmost care should be taken at the time of flooding to select a clear day and have the water as cold as possible to insure a good kill. The vines should also be observed very closely to determine the stage of growth of the hooks, and if the vines are far advanced and the hooks are well developed

the water often cannot be held any longer than ten to twelve hours with safety, and under some conditions even this length of time would be sufficient to cause injury.

More spraying has been done for the cranberry leaf hopper, ("Euscelis striatulus") this past year than ever before and unquestionably as time goes on this method of control for this insect will assume much greater proportions. Cranberry false blossom has done and is doing thousands of dollars of damage to Wisconsin cranberry marshes and in many cases, unless control is practiced many areas of valuable marshes will be destroyed and will have to be re-planted. Already in Wisconsin, large acreage has been injured by false blossom and all of us know the havoc wrought by this disease. Each grower should check very closely a number of places on his marsh with an insect net to determine the amount of hoppers. If he has an excessive amount of hoppers (this would mean over five to one hundred sweeps) he should seriously consider control and particularly if he has good clean vines or young plantings of susceptible variety. The only variety which is not very susceptible is the McFarlins, but even this, we know will take the diseases if disease hoppers feed upon it. To date the best spray materials is pyretheum which has been used in nearly all spraying for leaf hopper in Wisconsin. Dusting has been extensively carried on in the East, and next year we will try it in Wisconsin, at least on an experimental scale.

A very interesting problem has presented itself to me this summer in the discovery of a new leaf hopper (Ophiola Cornicula Marshall) on Wisconsin cranberry marshes that so closely resembles "Euscelis striatulus" that only by the finest discrimination can it be told. I do not know whether the species carries cranberry false blossom or not, but from my preliminary observations I think that it may. If this particular species does carry false blossom, it is going to present a much more difficult problem than the leaf hopper commonly associated with the disease and up to this time has shown to carry diseases because "Eucelis striatulus" is a one-brooded species, but this new species, which I have done some experimental work with last summer, has apparently several broods. I hope to do some additional work on this insect next summer and go more thoroughly into its life cycle and in the possibility of its transmitting false blossoms. Before I leave insecticides and control measures, I wish to emphasize the fact that a grower in spraying for insects, should use the utmost care in selecting insecticides. For example, in the control of the leaf hopper, it does absolutely no good to use what is known as the stomach poison, such as lead arsenate. You could cover the plants very thoroughly with a coating of lead arsenate and have absolutely no effect on the leaf hopper. Before spraying, always study your insect to determine how it obtains its food. In the case of the chewing insect, it can generally be controlled with a stomach poison, such as lead arsenate. For any insects with sucking mouth parts, a contact poison must be used, such as pyretheum or nicotine sulphate.

It is desirable if you intend to spray to consult the state cranberry specialist, so that you may be sure of using the correct insecticide. Large amounts of money are annually wasted by people spraying or using the wrong sort of material in the control of some particular insect. If you make a mistake in the proportions or in the kind of material used, you may lose the benefit you hope to gain, or even worse, may cause excessive damage to your plants. For example, if you sprayed your cranberry plants at the wrong time of the year with calcium arsenate, you might reasonably expect excessive burning to result with the loss of that year's crop.

It has been interesting to note that the girdler last summer was not as prevalent as it has been for the last two or three years. It has done extensive damage in certain areas to Wisconsin cranberry marshes, but I do not think that we need worry about it very much now, as we have plenty of water. Apparently with the rains we have had this fall and the snow so far this winter, we can all be assured of sufficient water for winter coverage and to take care of our insect problems next year. If any particular section is troubled with girdler, it should be flooded the later part of August or the very early part of September, just before the larvae are ready to go in what is known as the pupal stage for the winter.

Some growers will plant new area to vines next spring. I would roughly estimate this to be seventy-five acres to 100 acres. Much expense has been entailed to get this land ready to plant and every grower who is planting this new area, owes it to himself to select vines that are the best possible that can be obtained. No one should consider planting vines that are not state inspected because by so doing it is possible that badly diseased vines may be planted. There are a number of instances in the state where diseased vines have been planted and in some instances these areas have never even come into production and have had to be re-planted. This type of loss can largely be avoided by careful selection of vines.

This season has been a very successful one and many growers have had a good crop, although very few have had a bumper one. Prices have been good because of the short crop in the East and I am sure that the cranberry growers in Wisconsin are very well satisfied. No doubt some of our success has been due to the fact that because of the short crop in the East, berries have been sold out early this year, but I feel sure from my observation, that if some of our varieties were held until the Christmas season, we could have expected trouble from storage vats.

Most everyone is much interested in the prospect of next year's crop. I have been looking over vines a number of times this fall in various parts of the state and I find that in many places they are well budded, but I do not think from the budding that I have noted, unless we get ideal weather conditions that Wisconsin can expect a bumper crop for next year. I, however, look for a crop next year, unless something unforeseen comes up, a little better than this year's

crop. I base my opinion on the fact that both the northern marshes and the Cranmoor region ought to produce just as much as they have this year and perhaps a little more. In the Mather region, I am sure that some of the marshes down there that have not had anything for two or three years will have a light crop, even though their marshes have been severely hit by drought the past two or three years. I sincerely hope that Mather will again have sufficient water and if it does, I know that in three or four years the Mather marshes will again be producing almost as much as they did before the drought. We must remember that it is going to take some time before many of the sections which are now thinly vined will completely be vined over, and in other cases we know that it is going to be necessary to re-plant some sections. The growers in the Mather region, however, can now feel encouraged towards going ahead and re-planting the necessary sections and cleaning up their marshes, as with the Federal projects on in relation to conserving water and the fact that we are now swinging back to a wet cycle again, it seems that sufficient water will be assured.

FERTILIZER EFFECTS ON YIELD AND QUALITY OF CRANBERRIES

By F. L. MUSBACH

In the Forty-Sixth Annual Report of the Wisconsin State Cranberry Growers' Association the writer reported the results with the use of fertilizers on yield and keeping qualities of cranberries. On the Biron marsh which was included in this report, yields were obtained again in 1934 and in Table No. 1 is indicated the 1934 harvest together with the average for three years: 1931, 1932, and 1934.

TABLE NO. 1

Plot	Treatment	Average	
		Bbls.	Bbls.
1	4-R-12	138.9	124.0
2	Blank	141.9	120.0
3	2-R-6	125.5	86.0
4	2-R-12	133.6	82.0
5	Blank	133.9	76.9
6	2-R-12 (Kcl)	138.6	106.6
7	2-R-24	131.2	100.5
8	Blank	137.9	106.6
9	0-R-12	127.8	106.6
10	0-20-12	111.6	100.0
11	Blank	119.2	97.4
12	2-10-12	96.5	90.0
13	2-20-12	108.5	95.8
14	Blank	114.3	104.1
Average of all Treatments (9)		123.5	99.0
Average of all Blanks (5)		129.4	101.0

The area of each of these plots is 1/40 of an acre and fertilizers were applied in the spring of 1931. 400 pounds of the complete fertilizer were used in all cases except where the formula includes rock phosphate denoted by the letter "R". Plot 1, 3, 6, 8, 9, and 11 received rock phosphate at the rate of 400 pounds per acre. Where nitrogen is included the amount is applied on the basis of 400 pounds, likewise potash on the same basis. For example, plot No. 1 received 16 pounds of nitrogen, half from nitrate of soda, and half from Milorganite, 48% of potash (K20) derived from sulphate of potash in addition to the rock phosphate at the rate of 400 pounds per acre.

The average yield of all the fertilizer treatments on the Biron marsh in 1934 it will be noted is 99 barrels, and on the untreated or blank plot, 101 barrels. The three year average shows 123.5 for the

fertilized and 129.4 for the Blanks. Under conditions similar to that found on this particular marsh, the use of fertilizer cannot be justified on the basis of the results secured.

Fertilizer Effects on Keeping Quality

Representative samples were set aside from the Biron marsh at harvest time and a study made by Vernon Rogers to determine the number of decayed berries after standing in the warehouse for some time. The results of his studies made on the first of December are, as follows:

Average of Blanks ..... 1.9 berries per cup showed decay.
Average of Fertilized ..... 2.5 berries per cup showed decay.

The crop was harvested on September 29, and during this two-month period very little decay had taken place. The average number of berries per cup (average of 7) showing decay shows no marked differences. It is of interest, however, to note that the Blanks show somewhat better keeping quality than the fertilized crop. The differences are, however, not significant.

Fertilizer Effects on Cooking Quality

Three samples were submitted to the Home Economics Department of Stout Institute to determine whether any differences might be noted in the cooked berries that might be ascribed to fertilizer effect. Some little time was spent in determining the best cooking method to determine the peculiar quality of cranberry sauce. The conclusion was reached that for fifty grams of cranberries to which were added thirty grams of sugar, and twenty cubic centimeters of water cooked in covered vessel for a period of one minute over a high flame, a standard product was secured.

In such a product good cranberry flavor dominates, sweetness does not interfere with flavor, berries are bright red in color, liquor should be clear, viscosity that of a thin syrup, and the berries should be fairly uniform in shape, about one-fourth not broken.

Three lots from the Biron marsh were submitted for the test:

No. 1—Came from 4-R-12 plot.
No. 2—Came from Blank plot.
No. 14—Came from 2-10-12 plot.

Miss Orvetta Braker, who carried on the cooking test under the direction of Mrs. Myrna H. Meslow, reports the following conclusions:

1. If the fertilizer had any effect, number 2 must be the blank, and if not number 2, the fertilizer had little or no effect.

2. Number 14 berries ran consistently stronger in flavor in almost every judgment. It had the largest percentage of strong tasting cranberries.

3. Number 1, in the last judgments also had a large number of strong berries, although the flavor was not quite as strong as No. 14. Number 2 was blander in flavor. It had a distinct cranberry flavor, but not like number 14 and 1. A few of the berries were as strong as fourteen, but the percentage was low. Number 2 held its shape the best of all the berries.

4. All the cranberries were very nice in shape, color, and appearance.

5. We tried to be fair in our judgments, but even we had to taste the cranberries five or six times before any conclusions could be placed. In general, it may be stated that the housewife would never notice a difference between any of the berries' flavors.

6. All the cranberries had a desirable cranberry flavor. They differed more within themselves than with each other.

Cranberry Lake Development Company Plot

On one of the fields of this marsh Searle's Jumbos were planted in 1914. On June 7, 1933, 540 pounds of 2-16-8 were applied broadcast on two beds of a little less than a half acre, and two adjacent plots of about same size were left unfertilized. No yields were obtained in 1933, but in 1934 harvests were made on September 24 with results as shown in Table No. 2:

TABLE NO. 2

		Bbls. per A.	Cup count
Plot No. 1	.420 A. Blank	108.33	84.0
Plot No. 2	.464 A. 540 lbs. 2-16-8	119.56	84.7
Plot No. 3	.464 A. Blank	128.56	79.0
Plot No. 4	.464 A. 540 lbs. 2-16-8	145.65	81.0

Plot No. 2 and No. 4, as will be noted, received the same fertilizer treatment, that is 540 pounds of 2-16-8. Plot No. 2 gave a yield of 119.56 barrels while plot No. 4, 145.65 barrels. Mr. Rogers, who inspected the field in October reported the west third of plot No. 2 badly infested with false blossom which undoubtedly accounts for the lower yield as compared to No. 4. Averaging the blank plot gives a yield of 118.44 barrels while the average of the two fertilized plots 145.65 barrels, or an increase of approximately 27 barrels to the acre.

The cup counts show that the berries were of exceptionally good size on the average showing a trifle larger berry for the unfertilized. Bud counts made by Mr. Rogers on October 23 gave the following results: Plot No. 1, 44%; plot No. 2, 49%, and plot No. 4, 52%. A rather significant increase in bud development is to be noted.

FINANCIAL STATEMENT OF WISCONSIN STATE CRANBERRY GROWERS ASSOCIATION

Calendar Year 1934

			Receipts	Disbursements
Jan. 1		Balance on hand	$ 49.23	
Jan. 11	Check No. 139	Mrs. Irme Schroeder, steno. services, Dec. '33		$ 10.00
Feb. 27	Check No. 140	H. J. Rahmlow, 41 subs. to Wis. Horticulture		16.40
Mar. 27	Check No. 141	H. J. Gebhardt, telegrams		2.12
Mar. 28		Dues	4.00	
Apr. 24	Check No. 142	A. C. Rockwood, one cent stamps for reports		1.50
Aug. 15		Dues	24.25	
Aug. 15	Check No. 143	Goggins, Brazeau & Graves		22.75
Sept. 4		Dues	4.00	
Nov. 23	Check No. 144	A. C. Rockwood, 125 d. postal cards, Stamped Envelopes		3.00
Dec. 14		Check Tax		.10
Dec. 6		Dues	48.63	
Dec. 6		Dues	13.70	
Dec. 27		Dues	18.40	
Dec. 29	Check No. 145	Rachel Philleo, reporting Aug. Meeting		3.50
Dec. 29	Check No. 146	Crystal Josie, reporting Dec. Meeting		3.50
Dec. 29	Check No. 147	C. S. Smith, part sal. 1934		60.00
		Total Receipts & Disbursements	$162.21	$122.87
			122.87	
Jan. 1, 1935		Balance on Hand	$ 39.34	