Wisconsin State Cranberry Growers' Association. Thirty-sixth annual meeting, Wisconsin Rapids, Wisconsin, January 9, 1923. Thirty-fifth summer convention, pavilion, near Nekoosa, Wisconsin, August 8, ...

Wisconsin State Cranberry Growers Association
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Wisconsin State

Cranberry Growers' Association

THIRTY-SIXTH ANNUAL MEETING

Wisconsin Rapids, Wisconsin

January 9, 1923

THIRTY-FIFTH SUMMER CONVENTION

Pavilion, Near Nekoosa, Wisconsin

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LETTER OF TRANSMITTAL

To the Honorable John J. Blaine,
Governor of Wisconsin.

Dear Sir:

I have the honor to submit herewith the Thirty-sixth Annual Report of the Wisconsin State Cranberry Growers' Association, containing papers, reports and discussions, and a financial statement for the year 1922.

Very respectfully yours,

Guy Nash,
Secretary.

Wisconsin Rapids, Wis., January 9, 1923.

MINUTES OF THE THIRTY-FIFTH ANNUAL SUMMER MEETING

Moccasin Creek Pavilion, Near Nekoosa, Wis.,
August 8, 1922.

Meeting called to order by President C. L. Lewis, Jr. About 150 in attendance. Minutes of the thirty-fifth annual meeting, at Wisconsin Rapids, January 9 and 10, 1922, read and approved.

Violin and piano duet.....Edith and Alfaretta Walker
Violin and piano duet..Virginia Whittlesey and Elsie Ross

President Lewis in his opening address gave an account of his recent trip to New Jersey and Massachusetts bogs.

C. S. Beckwith, Cranberry specialist of the New Jersey Agricultural Experiment Station, reported on the use of fertilizers on cranberries in New Jersey and on the work of Miss Elizabeth C. White, in conjunction with the United States Department of Agriculture, at Whitesbog, New Lisbon, N. J., on cultivating and propagating native and hybrid blueberries.

A. U. Chaney of the Sales Company spoke of crop prospects and market conditions.

Report of the March meeting of the Executive Committee was presented by President Lewis.

(a) Questionnaire and its resulting information.

(b) Appeal to State Department of Entomology resulting in appointment of O. G. Malde as special part time investigator.

(c) Appointment of a committee on Water Problems, consisting of Guy Nash, chairman; Miss Lucetta Case, Kingsley B. Colton, A. E. Bennett and M. O. Potter.

Guy Nash gave a report from the Water Committee, which was accepted and the committee continued.

Miss Hendrickson of the Wisconsin Industrial Commission spoke on laws affecting women and minors employed on cranberry marshes, especially minimum wage and hours of employment.

O. G. Malde, representing the Department of Entomology, told of his work and general Wisconsin conditions.

On motion of Mr. Malde, the president appointed M. O. Potter, K. B. Colton and S. N. Whittlesey, a committee to draft a resolution of condolence on the death of Mr. Haines of the U. S. Weather Bureau.

The secretary, Mrs. S. N. Whittlesey, read a letter from Wm. E. Schimpff of the Pacific Cranberry Exchange.

The place for next winter meeting was left to the president and executive committee.

Meeting adjourned.

MRS. S. N. WHITTLESEY,
Secretary.

PRESIDENT'S ADDRESS

C. L. Lewis, Jr.

The good attendance today and the feeling of good cheer that prevails is undoubtedly caused by the good crop prospect universal over the state. When we see a fine crop developing we naturally like to talk about it, when the prospect is slim we generally have little to say.

Perhaps you will be interested in a trip Mrs. Lewis and I took through the cranberry regions of New Jersey and Cape Cod in July of this year. We left Beaver Brook on July 13th. Our first trip was to Pemberton, N. J., perhaps thirty miles from Philadelphia. Mr. Theodore Budd, one of the large growers of the state, drove us around his property, about five miles from town, in and out among the bogs, on the dams and around the edges, stopping frequently to allow us to examine the vines, crop, etc. The berries were about half grown and the crop promise fine. Bogs were very clean and showed no injury to speak of from frost, insects or fungi. I immediately noted the peculiar type of soil, called by Mr. Budd "Savannah Land." It was apparently a mixture of peat and sand and quite coarse in texture. The water was kept up to about eight or ten inches below the surface and I was told that in this type of soil this was necessary or the roots of the cranberry plants would become too dry; and still the surface of the ground was not excessively moist. The ditches were not deep and were much less in evidence than in Wisconsin.

At New Lisbon, the site of the famous "Whitesbog," established by J. J. White, and now operated by his son-in-law, Mr. Chambers, and his daughter, Miss Elizabeth White, we saw the results of a lifetime of toil and application. At Whitesbog there are about 1,000 acres of cranberry bog and 16 acres of cultivated blueberries and a most wonderful blueberry plant nursery where new varieties are developed. With its great system of reservoirs, roads, two entire villages for pickers, with its mammoth storage and packing house, its provisions for quartering Federal and State men who are cooperating with them, this bog presents a unit by itself, an organization well worthy of the ability and character of J. J. White, the founder. We who are still new in the cranberry business find at Whitesbog many developments worth copying and much to inspire us to increase our efforts at home. Their equipment, organization and system is built upon their own experience; when I saw their storage facilities, drying apparatus and many other things, I realized how little I had progressed in the cranberry business. No wonder the State and Federal authorities do much of their cooperative work at this point.

After a delightful day and a half at Whitesbog, not the least of which was our visit to Mr. Beckwith's experimental fertilizer plots, we were met at Toms River by Mr. H. B. Scammell, former cranberry insect specialist with the U. S. Department of Agriculture, and taken to the "Double Trouble Bog," where we met Mr. Scammell's partner, Mr. Crabb, a most congenial and enthusiastic cranberry man. These two gentlemen showed us several of the finest bogs in that section. Crops

were fine, bogs beautifully clean and our hosts jubilant. One thing we noted particularly was the manner in which wild berries grew at random throughout the undeveloped bog area; we saw vines with berries in the roads, back from the bogs, where they never had any care. It surely impressed us as being a natural cranberry soil.

We were shown where Mr. Beckwith's fertilizer tests on the Mill Pond bog had doubled and trebled the yield by proper application of fertilizer.

Some bogs had no reservoir as we have them in Wisconsin. They were located on streams large enough so the bog could be adequately flooded by merely holding back the water.

The main points we noted in a hasty trip of this kind through Jersey are: They are comparatively free from frost compared with Wisconsin; it is not necessary for them to level their bogs to the extent that we must do; only a few Jersey bogs are sanded. Therefore bog construction is much cheaper than in Wisconsin. Their suitable wild land is plentiful and cheap and Jersey bids fair to far outdistance all other cranberry regions in area and production in the future. I believe Jersey is subject to more enemies than either Cape Cod or Wisconsin and I do not think the keeping qualities will average as high as the colder states. They have more insect pests and less favorable market location than Wisconsin.

In Massachusetts we first spent several days at South Carver as guests of Mr. and Mrs. L. M. Rogers at the Atwood bog where I worked in 1910. These bogs are beautiful to look upon, totalling about eighty acres, divided into six or eight fields. Early Blacks and Howes are the main varieties. It is one of the prettiest bogs in the east, presenting uniform appearance, absolute freedom from weeds and good yield. The manager is one of the leading authorities in the east on the growing end of the game.

After a very profitable visit, we were taken for a week under the wing of Dr. H. J. Franklin at East Wareham, with whom I worked a short time in 1911. Aside from trips to a number of bogs on the Cape with Dr. Franklin, we had an opportunity to see the Massachusetts Cranberry Experiment Station in detail and to observe some of the experiments being conducted by Dr. Franklin. One is much impressed with the value of the Station to growers and of Dr. Franklin's services as a scientific observer and field man.

Our observations in Massachusetts give rise to the following deductions:

Practically every bog is sanded to a depth of from three to six inches before planting and the sand is coarser and cleaner than the average Wisconsin sand.

The bogs are much better drained than the average Wisconsin bog.

There are a greater number of enemies to combat than in Wisconsin, due I believe to the greater age of the industry there. The fire worm has increased to a marked degree in the past few years and is quite serious.

Every progressive grower has a spraying outfit for combating fireworm and other enemies.

There has been a great improvement in packing machinery in recent years.

The average production on the Cape is about 20 barrels per acre and 30 to 40 barrels is considered a very good crop.

In conclusion I would say that although in general the methods of production are similar, each cranberry growing district has conditions peculiar to itself. We cannot copy exactly the successful methods of any other section and expect similar results right off the bat. But a visit to New Jersey or Cape Cod opens one's eyes to many things of great value. Above all, it shows us that close study, perseverance and hard work are bound to find a handsome reward in the cranberry business wherever located. We gather many new ideas on such a trip and we return home to tackle the problems at hand with renewed energy and enthusiasm.

FERTILIZER EXPERIMENTS ON CRANBERRIES IN NEW JERSEY*

CHARLES S. BECKWITH, *Cranberry Specialist*,

New Jersey Agricultural Experiment Station.

Mr. President and Members Wisconsin Cranberry Growers' Association:

It is a pleasure to be able to meet with you here and to visit some of your bogs and it is an honor to have a chance to say a word to you. It is a fine education to visit bogs in various states and it would pay a person well to do some traveling before entering the cranberry business. The new ideas one gets are well worth the trip. I will say at this time that I will be glad to see any of you in New Jersey and will do what I can to show you what you want to see.

You will be interested in the size of the industry in New Jersey. There are 13,500 acres of cranberry vines in the state, of which 9,000 bore a crop last year. Nearly half of the area is planted in Jersey variety, most of which were taken from the wild without any selection for quality with the result that the average yield for the variety

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*See also the following bulletins prepared by Mr. Beckwith:
Circular No. 45, N. J. Dept. of Agriculture, "A Survey of the Cranberry Industry of New Jersey." 1922.
Circular No. 144, N. J. Dept. of Agriculture, "Cranberry Growing in New Jersey," 1922.
Reprint from Soil Science, VIII, No. 6, 1919, "The Effect of Certain Nitrogenous and Phosphatic Fertilizers on the Yield of Cranberries."
Reprint from Soil Science, XII, No. 2, 1921, "The Effect of Fertilizer Treatments on Savannah Cranberry Land."
Reprint from Soil Science, X, No. 4, 1920, "The Effect of Fertilizer on Blueberries."
Mr. Beckwith's talk on blueberries is not reproduced through lack of space. Growers interested may refer to Bulletin No. 974, U. S. Dept. of Agriculture, "Directions for Blueberry Culture, 1921" to be obtained from Superintendent of Documents, Washington, D. C., for 30 cents and to pamphlets on Whitesbog Blueberries, to be obtained from Miss Elizabeth C. White, New Lisbon, N. J.

is 11 barrels per acre. Twenty-four per cent of the area is in Howes and this grows 32 per cent of the crop at the rate of 22 barrels per acre. Early Black Variety is planted on 13 per cent of the area and it grows 19 per cent of the crop with an average acre yield of 23 barrels per acre. Other Cape Cod Varieties grown extensively are Centennial and Champion.

There are about 650 acres of young vines not yet bearing. Sixty-seven per cent of these are Howes and 18 per cent are Early Black.

Of the remaining bogs not bearing a crop, some were hurt by frosts, on some the water was held late to give the bogs a rest and some are badly run down but not given up.

About 90 per cent of the crop is sold through cooperative companies of which there are two operating in New Jersey.

My connection with the cranberry industry is not that of a practical grower, but as one of the experimenters of the New Jersey Agricultural Experiment Station. As our first and greatest work was to work out a fertilizer for cranberry land it might be interesting to follow our work in connection with your own. Our experiments were started nine years ago and have been carried on continuously since that time.

The soil that needed fertilization most was the savannah soil which is a sand with enough peat in it to give it a black color. It is one of the most productive cranberry soils in New Jersey. The data that I have today refers to this type of soil only.

The first work in determining a cranberry fertilizer was to find the kinds of plant-food to which the cranberry plant responds. Plant-food from the various common sources was applied to typical savannah land and the results recorded. Nitrogen at the rate of 40 pounds to the acre; phosphoric acid, 80 pounds, and potash, 100 pounds, both alone and in combination with each other, were applied annually. After three years, the vine growth became so great on the plots receiving nitrogen that it was concluded that the applications were too large and further treatments were omitted. The following materials were used: Nitrate of soda, ammonium sulfate, dried blood, cottonseed meal, acid phosphate, basic slag, rock phosphate, steamed bone, bone meal, muriate of potash, sulfate of potash and kainit.

Considerable knowledge was gained by this first experiment. We found out definitely that 40 pounds of nitrogen is too much to apply annually to cranberry land. Nitrate of soda and dried blood proved to be excellent carriers of nitrogen, but sulfate of ammonia was actually detrimental, in the amount used. Acid phosphate had a quick action and rock phosphate was effective after the first year. Both were efficient carriers of phosphoric acid. Potash gave "hit or miss" results, but of the three carriers used sulphate of potash gave more even gains.

The next thing to do was to determine the best source of nitrogen. Nitrate of soda, dried blood or a mixture of the two. It was also necessary to determine the correct amount for annual application. This work has been carried on for three years and we know now that the choice lies between nitrate of soda and the mixture of the two. Thirty pounds of nitrogen or 210 pounds of nitrate of soda is a fair treatment

for very poor soil, but on richer soils 20 pounds might be a safer treatment.

A rather large series of plots showed us that rock phosphate should be used in amounts not less than 300 pounds per acre per year for best results.

The complete fertilizer we are recommending for savannah cranberry land is made up as follows:

Sodium nitrate	75 pounds
Dried blood	75 pounds
Rock phosphate	300 pounds
Sulfate of potash	50 pounds

The first year the material was used, 300 pounds of acid phosphate was added in order to have phosphoric acid available the year of application. The results of three years test with this material are available now. They follow:

RESULTS OF TESTS WITH DIFFERENT AMOUNTS OF THE CRANBERRY FERTILIZER MIXTURE

Plot	Treatment per acre	1919		1920		1921	
		Yield per acre	Increase over checks	Yield per acre	Increase over checks	Yield per acre	Increase over checks
		lbs.	*per cent*	*lbs.*	*per cent*	*lbs.*	*per cent*
SB-F-C-1	Nothing	3,800		1,540		5,750	
SB-F-C-2	264 lbs. mixture 176 lbs. acid phosphate*	4,780	20	2,520	61	10,160	71
SB-F-C-3	Nothing	4,000		1,580		15,930	
SB-F-C-4	528 lbs. mixture 352 lbs. acid phosphate	5,180	20	2,620	68	10,660	72
SB-F-C-5	Nothing	4,680		1,540		6,520	
SB-F-C-6	792 lbs. mixture 528 lbs. acid phosphate.	6,340	38	3,680	82	14,700	117
SB-F-C-7	Nothing	4,500		2,500		7,000	
SB-F-C-8	1,056 lbs. mixture 704 lbs. acid phosphate.	5,200	49	2,980†	45	12,550	96
SB-F-C-9	Nothing	2,860		1,600		5,840	

*The acid phosphate was added in 1919 only.
†No fertilizer applied in 1920.

The results show that on thin savannah soil about 800 pounds of the mixture gives excellent results. Five hundred pounds gives good returns and for general purposes it seems to be the safest amount to use.

Our experiments on muck cranberry land are not as extensive as the above and we cannot give a formula for fertilizing such land. However, the general practice is to use 500 pounds of the savannah fertilizer on muck bogs after they become worn out, but the one application lasts several years.

DISCUSSION

MR. BECKWITH. Use acid phosphate for quick results but rock phosphate for continued application. Any sulphate injures cranberry soil.

Nitrogen causes profuse vine growth. One year experimenting is valueless, for genuine results continue over a series of several years.

Water cure for weeds is practiced, water being held till July 5th. Strong soil and vine growth is necessary for good results, if weak fertilize the previous year. Certain grasses are affected, others not; vines are given two weeks start over grasses. Ferns may be treated with two or three drops of sulphuric acid or dug out.

Rot is main New Jersey trouble, cannot sand because heat is too great and promotes rot; spraying with Bordeaux controls it. Good drainage is necessary, water being kept from a foot to a foot and a half down in ditches which are never filled. The climate is moist. Blight is a plant disease and occurs when blossom forms.

PRESIDENT LEWIS. Recommends trial of fertilizer on small scale. With use of fertilizer drainage is necessary and one foot in New Jersey probably equivalent to two and a half feet here.

E. P. ARPIN. Suggests buying fertilizer wholesale and distributing to growers. Finds effect of rock phosphate persists, but also fine for grass growth.

J. SEARLES. Rock phosphate helped size of vines and fruit.

A. U. CHANEY. Suggests rock phosphate to grow vines and water cure later to kill weeds and also burning old, woody vines; allow to grow one season and apply water cure following season.

CROP PROSPECTS AND MARKET CONDITIONS

A. U. CHENEY.

On Cape Cod the crop is spotted. Many bogs removed the winter flood about May 15 and were unable to reflow, losing heavily through late frosts. The crop is estimated at 275,000 barrels.

New Jersey has a good crop although rain prevented late blossoms from setting fruit. The estimate for New Jersey and Long Island is 225,000 barrels.

Present estimate for Wisconsin is 45,000 or 50,000 barrels, making a total for the three states of 550,000 barrels.

Grains, vegetables and fruits (except oranges) all promise large crops, the effects on cranberries being uncertain. I look for a good price, but not so large as last year.

REPORT ON EXECUTIVE COMMITTEE MEETING

PRESIDENT C. L. LEWIS, JR.

Following the meeting of the executive committee last spring the following letter was sent to all growers in Wisconsin.

To All Cranberry Growers of Wisconsin:

The executive committee of the Wisconsin State Cranberry Growers' Association held a meeting at Wisconsin Rapids on March 23, 1922,

for the purpose of formulating some sort of policy which might make the association of a greater benefit to the members.

Three main ideas were acted upon:

First. The dry seasons of the past two years and the resulting crop failure have emphasized the importance of an adequate and sure water supply. Many marshes of the state have suffered through the overdrainage of the lands which fed their reservoirs, and by carrying out of the country of water which is vital to their welfare. It is believed that by cooperation among the growers some relief in this direction can be secured, possibly through state agencies. A committee was appointed to work up information and data on this subject. The committee is as follows:

Guy Nash, chairman.....Wisconsin Rapids, Wis.
M. O. Potter.....Wisconsin Rapids, Wis.
A. E. Bennett.....Cranmoor, Wis.
Miss Lucetta Case.....Valley Junction, Wis.
K. B. Colton.....Spring Brook, Wis.

Anyone interested in this question is urged to cooperate with this committee.

Second. In order to get at the exact facts concerning the status of the cranberry industry in Wisconsin and to spread information that is of benefit to every grower, it has been decided to send out a questionnaire to every grower in the state. These will be sent out at intervals during the season, asking for specific information about the condition of the marshes, presence of pests and other facts of interest. A summary of replies will be mailed to every paid up member of the association, thus keeping him in touch with conditions throughout the state.

Third. It was decided to appeal to the State Department of Entomology for assistance in solving our insect problems and we are glad to report that this department is going to send a man into the field during the summer at their expense to assist growers in a better knowledge of cranberry insects and their work.

We urge you to take advantage of the questionnaire service which we are sending you. It will cost you nothing more than payment of your annual dues and if you have not paid be sure to send $1.00 to Mrs. S. N. Whittlesey, secretary, and be assured of this service. Its chief purpose is to bring to light problems that puzzle you, facts that are of interest to us all and to strengthen the growers' organization.

QUESTIONNAIRE No. 1

Name of owner or company, manager or superintendent, post office
Number of acres that you pay taxes on
Acres in vines
Acres in reservoir
Crop 1919
Crop 1920
Crop 1921
Acres of each variety and age
Acres planted on sand
Acres old bog resanded
Acres unsanded
Did you do any sanding the past winter, and if so cost per acre, number of acres, how much sand and what method?
What was the condition of budding last fall, strong, fair or poor?
How were vines protected over winter?
Did you suffer any winterkilling?

What was the cause of your crop shortage in 1921, if any?

Check your most serious cause of loss, dry weather, fireworm, tipworm, fruitworm, other causes.

Have you any water problem, if so explain fully.

Suggestions and criticisms are solicited.

Yours for a big year in 1922,

Wisconsin State Cranberry Growers' Association.

After much delay awaiting replies to this questionnaire, the following was mailed to all members.

June 10, 1922.

SUMMARY OF REPLIES TO QUESTIONNAIRE No. 1

We are glad to report that after seven weeks of patient waiting we are able to report receipt of 44 replies to Questionnaire No. 1. There are about 26 more growers in the state that we would like to hear from, but in justice to those who have replied we tender herewith a summary of the replies received to date, hoping that those who have not yet replied will hasten to do so.

Sixteen out of 44 growers have water problems of a serious nature. Until these growers are assured of a permanent water supply their business is in jeopardy. The encouraging point is that in almost every case there appears to be a possible solution to their troubles, which only calls for cooperation and activity on the part of the growers themselves. The committee on "Water Problems" have the opportunity to render a great service to those in need of help.

The general crop shortage in 1921 and the reasons therefor are graphically told in the 44 replies. Dry weather was blamed as the chief cause by 18 growers, fruitworm by 14 growers, tipworm by 13 growers, frost injury by 9 growers, poor budding by 3 growers, and much to our surprise the fireworm as the chief culprit in only two replies.

Too much farming on the side or too much attention to outside business might well have been given as a reason for crop shortage by some. Farming at the expense of the cranberry crop certainly does not pay, especially these days.

Insects are apparently our greatest enemy and in view of this fact the State Department of Entomology has commissioned Mr. Malde to work in the field on cranberry insects and advise the growers. We hope that he will be able to dig up some reliable information about the tipworm and further increase our knowledge of how to fight the fruitworm. We feel that we should be able to control the fireworm if we are awake to the time when the first brood is at work.

Frost should not concern us if our supply of water is adequate, only we must be on the job each and every cold night.

Sixteen out of 44 growers did some sanding last winter. The usual amount put on old vines was one-half inch, the cost varying from $12.00 to $50.00 per acre. Apparently many growers could cut the cost of their sanding by improved methods.

Winterkilling was negligible in the state. Twenty-three growers reported strong budding, 20 a fair budding and no one a poor budding. In view of the heavy rains of April and May it is hoped that water supplies will be more adequate than a year ago. In view of the lack of winterkilling, the general good budding and the absence of frost to date, it can properly be deduced that the crop in the state promises to be good, barring injury before harvest.

It is not likely that fireworm injury will be severe this season due to the general activity of the growers in flooding this year for the first brood.

The 44 replies to the questionnaire together with information available show 51 growers to be paying taxes on 38,059 acres of land, of which 1,727 acres are in vines. From the replies received, 50,000 acres is a fair estimate of our holdings in the state with perhaps 2,500 acres in vines. It is hoped that we can gather the missing information and have a complete census of the acreage by the time of the August meeting.

The state of New Jersey has recently published a circular showing a complete census of the cranberry industry in that state. The state of Massachusetts is working on a similar report at this writing. "Why not Wisconsin also?"

All we need in this state is closer cooperation, a stronger association, and exhibition of pep occasionally that will put us on the map. We contribute considerable funds to the State Treasury. The State maintains agencies for our assistance in Madison. Let's ask for what we deserve, but before we ask let us send in our questionnaire, those of us who have not done so, and pay the modest $1.00 per year membership fee. We can guarantee you that no better investment can be made.

With sincere wishes for a successful season.

Wisconsin State Cranberry Growers' Association,
By its Executive Committee,
Mrs. S. N. Whittlesey, *Secretary.*

REPORT OF COMMITTEE ON WATER PROBLEMS

Captain Guy Nash, *Chairman.*

Your committee, accompanied by Prof. O. R. Zeasman of the University of Wisconsin and by O. G. Malde, visited the Cranmoor, Mather and Tomah districts, investigating the Potter and Elm Lake marshes, the Hemlock Creek diversion canal and weir, the Wood County Drainage District diversion works, Grand Marsh north of Mather, the Association test wells near Mather, and the Metallic Bell, Weatherby and Oscar Potter marshes.

The committee finds:

(1) That adequate water for flooding for frost protection, for insect control, for winter protection and for irrigation is the first essential for successful cranberry growing in Wisconsin; no new bog should be established hereafter without absolute control of a sufficient water supply.

(2) That many cranberry marshes have been damaged and in some instances destroyed, by drainage, through lowering their water table and by carrying off surface and underground waters formerly flowing into their reservoirs. This drainage seems in many cases to have been very ill advised, no beneficial use having been made of the drained land which has grown up to weeds and in places burnt to the underlying sand.

(3) That every grower should help himself by conserving water to the greatest possible extent by improving reservoirs, etc.

(4) That in general cooperation between growers of any particular watershed will be necessary for fair division and fullest use of water.

(5) That access to water and rights of use wherever practicable should be secured at the earliest possible moment; costs which seem unreasonable now may, a few years hence, appear trivial compared to benefits assured.

Your committee further recommends:

(1) That passage of legislation be secured authorizing establishment of cranberry districts, analagous to present drainage districts.

(2) That legislation be secured authorizing diversion of water from drainage ditches to cranberry reservoirs or lands by flow or by pumping under conditions equitable to both cranberry growers and drainage districts; or if this right already exists but is disputed, that court test be arranged.

(3) Specifically for the Cranmoor district your committee suggests the possibility of betterment through raising the reservoir dam of the Elm Lake Cranberry Company which will enable more water to be captured at flood times from Hemlock Creek.

Possibilities of pumping back to reservoirs, considering recent developments of pumps, electric power transmission and internal combustion engines, are not yet exhausted, but this does not make any more water, instead very likely depriving a grower lower down on the watershed of accustomed water.

Attention is called to reservoir improvements in progress on the Potter, Bennett and Gaynor marshes, to the amicable arrangement for diversion of water from the Wood County Drainage District to the Potter, Rezin and Whittlesey marshes, and to the advantage of early acquirement of water rights as illustrated in the Metallic Bell bog, which draws its supply from the Beaver, and has been unaffected by later use of the Beaver for drainage.

Credit is given to Prof. Zeasman for the suggestion as to cranberry districts, and improving Elm Lake for the Cranmoor marshes.

In conclusion your committee wishes to impress on you that none of the suggested remedies will get anywhere without an unprecedented fullness of cooperation. Cranberry districts in particular will depend for success on a lot of funerals for nicked and rusty hatchets, foregoing of supposed advantages (often only supposed) for the common good, willingness to help the other fellows, and willingness to pay for a real advantage the other fellow gives up to help you.

REPORT ON THE PROGRESS OF THE CRANBERRY INSECT SURVEY UP TO AUGUST 8, 1922

O. G. Malde,

Deputy State Entomologist on Cranberry Insect Control

At the outset, let me state that this insect survey and control work under the State Entomologist's office of the State Department of Agriculture is not experimental or insect breeding work.

The work has to do with the studying the prevalence and activities of the insects most injurious to the cranberry vines and fruit, and to call to the growers' attention these facts and suggest remedial measures.

Experimental work in the study of the life history of the insects and in the testing out of new methods of eradication come under the scope of the department of Economic Entomology of the Agricultural Experiment Station.

With the limited funds for the work, the plan this season (1922) was to spend only about half time in this work, hence the visits through the cranberry regions were made at intervals of some days.

The work was started the 14th day of May, and the black-headed fireworms were already found emerged on bogs in the Tomah district, and those found were at least two to four days old. They were found to be quite numerous on one bog that had been drained for some weeks. Other bogs were still nearly covered by the winter flood, hence retarding the emergence.

The first visit to the bogs was continued from Tomah district to Warrens, Mather, and Cranmoor districts. On practically every bog the black-headed fireworm was found to be out and active and in some cases the growers were not aware of its presence. The most severe infestation we have ever seen was found on the "Grand Marsh," twelve miles north of Mather. Here there was found to be lack of water for immediate flooding, which was urged as the surest remedy, and the party in charge decided to pump a flood at once. At this time few other insects of importance showed up in this district.

In the Cranmoor district the black-headed fireworms were only scattering, although a few were found on nearly every bog. Traces of the yellow-headed fireworm were also found in this district, but they were not abundant, although on more bogs than we have seen them before.

On May 21, I met Dr. Fracker at Phillips where we together visited the Cranberry Lake Development Company bog, where but a few fireworms were found.

At that time it was decided that a circular letter to the growers would be timely and of immediate aid before we could complete the first inspection trip. Accordingly on May 26 the following letter was sent out from the Madison office of the State Entomologist, dated May 25, 1922.

WISCONSIN DEPARTMENT OF AGRICULTURE
STATE CAPITOL

Madison, Wisconsin, May 25, 1922.

To the Cranberry Growers:

An inspection of most of the cranberry bogs in the Mather-Warrens district and in the Cranmoor district shows that the black-headed fireworm or vine worm is present on practically every bog.

It is serious on only a few of them, but since some of the worms were found on every bog visited the following treatment is urgently recommended:

First Treatment

All bogs should be given a complete 36-hour submergence within the next week, unless this flooding has already been done. The flood should be applied in the afternoon and evening and left on for that night, the following day and the second night; then drawn off early the following morning.

The water is quite cool at this season and vine development is such that no danger of injury need be feared.

Second Treatment

About a week later the submergence should be repeated to catch any worms which hatch after the first was applied. The second flood should also be allowed to remain for 36 hours, like the first.

While this submergence can be made safely at any time now, the approach of a cold period with near frost temperatures, requiring a flood for frost protection, offers the most satisfactory conditions for insect control at the same time.

High vines which cannot be submerged should be doused by pulling a float in the form of a 2x4 or 2x6 plank over them several times.

Spraying May Be Necessary

High vines or other growths on lands should be destroyed, or else sprayed with a nicotine solution,—the following formula is recommended:

Black leaf 40	1 quart
Soap	4 pounds
(Fish oil soap is best.)	
Water	100 gallons

The black leaf 40 may be secured from any concern which handles spraying materials.

A spray of arsenate of lead in the proportion of 3 pounds of the arsenate (powdered) to 50 gallons of water containing 2 pounds of soap may also be used.

High vines in beds should be sprayed while the flood is on if the float is not used to douse them.

Very truly yours,

O. G. MALDE,

Deputy State Entomologist on Cranberry Insect Control.

The first trip of inspection was continued to Cameron, Beaver Brook, Spring Brook, Minong, Spooner (McKenzie Lake Bog), and Hertel, then to Waupaca, Embarrass, Berlin, and back to Wisconsin Rapids district.

As in the early part of the trip nearly all the bogs were found to have some black-headed fireworm, and at Berlin there was found quite an abundance of oblique-banded leaf roller. This is also a vine eater, but larger than the black-headed fireworm, and has an orange colored head, dark olive green body over an inch long, with row of white dots on each side of back. It is described in Wisconsin Agricultural Experiment Station Bulletin No. 159.

This worm when nearly grown will spin up two to three times as many vines and do the same damage to them as is done by the black-headed fireworm.

On returning to the Cranmoor district we found some of the growers had resorted to the flooding for protection, and had checked insect development. On many places where the fireworm and leaf roller had been plentiful, it was found that submergence could not be secured, either for lack of water or on account of the dams being too low to permit a complete submergence of the areas. The loss from insect damage in such cases varies from twenty per cent to ninety per cent up to this time.

The vines on practically all bogs were found to be very thrifty and showing a uniformly heavy budding, indicating a probable forty-five to fifty thousand barrel crop with all things normal. The indication certainly points to the largest crop since 1912.

Our second trip was started early in June and on the fifth the first tipworm was discovered in the Warrens district, after that being found on nearly all bogs, except in the northern part of the state.

On June 18 the first fruitworm miller of the season was caught on the old Experiment Station bog.

The large green leaf hoppers commenced to show up about June 26th.

Second brood yellow-headed fireworm were found June 25, and the third brood August 1.

The second brood black-headed fireworm was found July 12, and during the week of June 20 the millers were found unusually numerous on the worst infested areas of the Mather and Tomah district.

With the appearance of the fruitworm miller and the probable emergence of the black-headed fireworm early in July, a second circular letter was formulated and sent out from the State Entomologist's office, June 30, as follows:

STATE DEPARTMENT OF AGRICULTURE

Division of Insect and Plant Disease Control

S. B. FRACKER, *State Entomologist*

State Capitol, Madison, Wis., June 30, 1922.

To the Cranberry Growers:

A visit to numerous bogs during part of the first three weeks of June showed that the *tipworm* is quite generally distributed on all bogs in the main cranberry region. The second brood of tipworm will probably be working by July 1st, and in some cases earlier as the adults or little flies are already out. As no summer treatment is known for this insect, however, we must anticipate serious injury to next year's crop if we have an early fall.

The second brood of the black-headed fireworm (*rhopobota naevana*) is at work in a few cases, and the millers are flying generally. By the end of June or early in July the worms are apt to be very active where

there was an abundance of the first brood. As soon as they appear to attack fruit severely, it is advisable that a spray be applied to the infested area, as was recommended for high vines in the flooding against the first brood fireworm.

Flooding cannot be recommended as a general remedy at this season except where it is evident the fireworm will destroy the crop, in which case, if spraying is not resorted to, the area should certainly be flooded up completely to get the best possible result in killing the insect at the risk of the loss of the crop.

Clean all dams by mowing and burning the rubbish or vines on them at once.

Burning of vines on badly infested areas cannot be recommended, for two chief reasons; (a) a uniformly even burning is seldom obtained, thus leaving a bad-looking bed requiring considerable mowing in remaining unburned patches; (b) or as was the case on several places in 1921 the burning was so deep that it killed out the vines completely, the owner losing several years' of crop.

Vines too high to flood should be mowed, rolled, or sprayed.

Where but few fireworms are found, a chance can be taken of the damage they will do this year, and have all dams repaired and raised so that next spring complete submergence at ten-day intervals can be made to eradicate them.

For spraying use:

Black leaf 40	1 quart
Rosin fish oil soap	4 pounds
Water	100 gallons

Or use:

Powdered arsenate of lead	3 pounds
Rosin fish oil soap	3 pounds
Water	50 gallons

Black leaf 40 may be secured from any insecticide dealer, and rosin fish oil soap from James Good, Philadelphia, Pennsylvania.

The earliest *fruitworm* millers have emerged, and for any small areas we would recommend the use of sprays mentioned above to control them.

We cannot safely recommend the surface flowage for the fruitworm. We wish, however, to call the attention of the growers who have decided to try the method to the fact that now is the period of possible effectiveness of the remedy.

It should be remembered that the fruitworm appears first on high vines and on dams, again, therefore, emphasizing the need for cleaning dams and spraying high spots.

Cranberry Vine Inspection

The State Nursery inspection law applies also to cranberry vines, and no cranberry vines can properly be sold, disposed of for planting, or shipped unless an inspection certificate has been granted by the state entomologist. There have been some violations of this regulation the past season, possible through a misunderstanding of the law.

Vine inspection is free to those who request it at once, but when applications are received too late for making examinations on regular trips, the expense of the extra trip of the inspector is charged against the person requesting the late inspection. Send applications to State Entomologist, Capitol Annex, Madison, Wis.

For making shipments, tags bearing a copy of the State License must be used. They can be secured in blank form, so only dates need filling in each season.

Very truly yours,

O. G. MALDE,

Deputy State Entomologist on Cranberry Insect Control.

The outbreak of the second brood of black-headed fireworm this summer is the most destructive we have ever seen. The only hope for successfully combating the insect at this stage, in badly infested areas, seems to be to completely submerge the bog and sacrifice the crop to subdue them. As this was not done in some places where it might have been done, and as in other cases complete submergence could not be secured, it is important therefore to plan this fall and winter to improve the water supply and build up all low flooding dams so that next spring the insect flood can be applied early and effectively. We must get this pest or it will continue to get a large part of the crop.

The flood cure for eradicating grass and weeds has been tried on several bogs and the results seems quite favorable. It will be interesting to observe such tests another season as they no doubt are of considerable help, yet care must be taken not to use the water cure on too young planting we believe.

The following is a table showing emergence dates of the chief cranberry insects in 1922:

EMERGENCE DATES 1922

Insects	Broods						Remarks	
	First		Second		Third		Condition 1922	Plans needed for 1923
	Larva	Adult	Larva	Adult	Larva	Adult		
Black-headed Fireworm	May 14	June 6 4 days out	July 12	July 25			Bad	Insect flood
Yellow-headed Fireworm	May 16	June 10	June 25	July 22	Aug 1		Few, negligible	Insect flood
Oblique Banded Leaf-roller	May 24 June 30						Few	Insect flood
Tip Worm	June 5	June 11	July 2	July 9		Aug. 7	Bad	Study and flood
Fruit Worm						June 16	Limited	Study and flood
Leaf Hoppers	June 26		Active all throughout the season.					

Up to August 1 the cranberry fruitworm did not make much of a showing, but during the first week of this month it has become alarmingly active in places. Little or nothing can be done to control it except by risking the crop in the use of water for a submergence, as most bogs are not equipped for spraying.

It will be interesting to watch the results of some flooding tests made by growers reported here today.

In conclusion let me again urge the vital importance of planning work for this fall and winter for the improvement of the bogs, so that complete submergence can be secured in an insect flood at the proper time next season.

PACIFIC CRANBERRY EXCHANGE

Astoria, Oregon, August 5, 1922.

Dear Mrs. Whittlesey:

The very pleasant visit which I made recently to the cranberry district in the vicinity of Wisconsin Rapids, was not only one of the most delightful trips I have ever made into a cranberry growing section, but one of the most instructive as well.

The most gratifying feature of the occasion was the first-hand knowledge I received of the wonderful loyalty of your growers to the sales organization through which you market your cranberries. To me a resident of the Pacific Coast, thoroughly familiar with the workings of cooperative marketing agencies, it was indeed a revelation to find in an eastern state the remarkable perfection to which your sales organization has been carried. It seemed to me to be quite unanimous.

I went away feeling that I had learned much that I never knew before concerning cranberries and cranberry culture.

I had always held the belief that cranberry growers were far superior in every way to the ordinary run of people, and the most gratifying result of my visit to your cranberry district, is that this belief has now ripened to a conviction. Yours very sincerely,

WM. E. SCHIMPFF.

MINUTES OF THE THIRTY-SIXTH ANNUAL MEETING

Wisconsin Rapids, Wis., January 9, 1923.

The winter session opened with a banquet at the Hotel Witter, at 7 o'clock, on January 8th, with eighty-eight growers and friends of the industry present. Capt. Guy Nash acted as toastmaster, and responses were made to the following toasts:

Pioneer Cranberrying—S. N. Whittlesey, Cranmoor, Wis.

The Eternal Feminine on Cranberry Marshes (by letter)—Miss Lyda M. Huyck, Minong, Wis.

Hard Times—M. O. Potter, Wisconsin Rapids, Wis.

Joys of an Inspector—C. L. Lewis, Jr., Beaver Brook, Wis.

The Transition Era—Andrew Searles, Walker, Wis.

When East Meets West—Dr. H. J. Franklin, East Wareham, Mass.

When Dreams Come True—F. R. Barber, Warrens, Wis.

These toasts have been embodied in this report so far as they relate directly to cranberry culture or its history.

A special feature was the music furnished through the courtesy of Mr. F. J. Wood, including several solos by Miss Alice Damon, and Mr. Don Johnson furnished extemporaneously a Scandinavian dialect sketch entitled "Raising Cane."

The banquet was a great success and the innovation met with the unqualified approval of all present. Mrs. S. N. Whittlesey, the retiring secretary, was the originator of the idea and made all arrangements,

besides "selling" a part of her enthusiasm to other members so as to assure their attendance.

The thirty-sixth annual meeting was called to order at 10:30 January 9th by President C. L. Lewis, Jr.

Minutes of thirty-fifth Summer Meeting, August, 1922, were read and approved.

The president's address stressed the necessity for careful study of bog conditions, all of which affect the growth of the cranberry plant, if successful crops are to be raised.

Secretary presented financial report, and F. R. Barber, H. J. Gebhardt and Guy Nash were appointed auditing committee.

Paul O. Nyhus, agricultural statistician, complimented the growers on not only raising a fine crop, but on successfully marketing it, in contrast to many other producers' meetings recently attended where the prevailing sentiment seemed to be, "What is the use increasing production when we cannot profitably dispose of present production." He impressed the value of production statistics to the growers and urged the fullest cooperation.

The Mather pumping experiment, after report by B. R. Mitchell, was discussed at length and decision reached to carry to a conclusion the following summer. A. B. Scott was appointed to work with the committee in charge.

A paper by O. G. Malde embodying the results of his observations during 1922 was read.

Following luncheon Dr. H. J. Franklin addressed the growers, summary of his talk appearing elsewhere in this report. Dr. Franklin gave a great deal to us in his discussions aside from what is in the published address, all so interesting and valuable to us that we regret every word cannot be included.

Dr. S. B. Fracker, state entomologist, reviewed the situation existing between his department and the growers, and the possible channels for further assistance. Following very full discussion, upon motion by F. R. Barber, duly seconded by M. O. Potter, and unanimously passed, the following resolution was adopted:

Resolved, That the Wisconsin State Cranberry Growers' Association requests the State Legislature to appropriate two thousand ($2,000) dollars per annum for aid in securing the services of a field man in cooperation with the State Department of Agriculture, to assist the cranberry growers in controlling insects and other enemies of the cranberry crop.

That the executive committee be authorized to present this request to the legislature at the present session and see that it is presented adequately before the joint finance committee.

Auditing committee approved secretary's financial report.

Officers were elected as follows:

President—C. L. Lewis, Jr.
Vice president—F. R. Barber.
Secretary—Guy Nash.
Executive committee—A. E. Bennett, A. B. Scott.

Pavilion near Nekoosa was fixed as place of next summer meeting.

The committee on revision of the constitution, consisting of M. O. Potter, S. N. Whittlesey and Guy Nash, reported and on motion of George M. Hill the constitution as amended was adopted, as it appears elsewhere in this report.

Upon motion of Guy Nash, following resolution was adopted by rising vote:

Resolved, That the Wisconsin State Cranberry Growers' Association regrets to learn that other duties make Mrs. S. N. Whittlesey desirous of relinquishing the task of secretary of this association.

That it appreciates her long period of unselfish and useful service, her unfailing enthusiasm and her initiative.

That in acceding to her desire to be relieved of further service, it suffers a loss, and hereby extends to her, sincere and heartfelt thanks for what she has done for the association and all growers.

On motion the association adjourned.

GUY NASH, *Secretary.*

PRESIDENT'S ADDRESS

C. L. LEWIS, JR.

At the banquet last evening we were told by our most experienced growers, of the different stages of progress in the history of the cranberry industry in this state. Any one who heard the remarks of these men, the talks of their early struggles, their many disappointments and their dogged determination to succeed, which they finally did, must realize the very great debt of gratitude we have for them today.

There are times when the cranberry business looks like a mighty tough business, especially so when one is stumbling around with a lantern chasing water about 2 A. M. some frosty night. But if in the morning we find we have saved our cranberry crop and we see our gardens turned black with frost and the cornfields frozen, then we rejoice and realize that it is pretty fine to be able to save a crop of cranberries by flooding.

We surely have progressed since the time when one of our growers in a talk before this association made the rash statement, "I have come to the conclusion that it is a good practice for the grower to walk through his cranberries occasionally during the season."

In order to produce crops of cranberries successfully and profitably we must know a great deal about the processes that influence vine growth and fruit production. We must first observe very closely the many changes that take place in the 90 days or so of the growing season in which a crop matures. Where conditions are favorable we get favorable results and the simplest way to learn is to study the conditions that have caused favorable results, study them and solve the reasons for success and then supply these same reasons or favorable conditions in so far as we can on our entire property. This calls for a daily examination of our vines from the time they start growth in the spring until the berries are well set and frequent examinations thereafter.

What are some of these things that influence the size and quality of a crop of cranberries? We can say that the plant itself is made up of root system, stem, leaves and buds. Through the root system is taken in food and moisture, the leaves absorb light, air and moisture, the stems are the transporting agent and within the bud lies the germ of reproduction. We know that fruit buds indicate fruit, we ought to know that formation of fruit buds must be the result of a healthy

condition of the plant, in other words the roots, stems and leaves are functioning properly. Therefore we want good roots and good stems and leaves.

To induce a healthy, vigorous root system we must have proper soil, sufficient drainage, sufficient moisture and plenty of opportunity for the roots to grow and develop without too much competition. Therefore a deep, vigorous root system is the first step in the production of a crop of cranberries.

A deep, healthy root system will naturally result in a healthy, sturdy vine and a healthy vine will produce a fine crop of fruit buds. We are taking it for granted that these vines are well protected by ice or water over winter and not exposed to severe weather during the thawing and freezing period of the spring.

Thus we see how the conditions that influence the development of the roots, vine and buds during one season are responsible for the crop of the following season. But even with a good budding our battle is only begun. We must protect against spring frosts, we must watch and flood for the fireworm, we must control the drainage and supply moisture when necessary, we must prevent the fruitworm and prevent or lessen the injury of the tipworm, we have our rots and our hailstorms, our floods and our droughts to contend with. We have the problem of harvesting and packing and after that the care of the bog and preparation for winter protection.

With all these problems the business is most fascinating. There is nothing to be compared with the supreme satisfaction and enjoyment of guiding a cranberry crop from its first swelling of the buds in the spring to its safe stowing away in the warehouse. Because of the nature of the business it is not attractive to the lazy, the unambitious or to the get-rich-quick schemer. It is not a business for the mollycoddle but it is a wonderful business for the lovers of outdoors who have vision, imagination, initiative and perseverance. There is no competition in the cranberry business in the sense that there is in the average business, we should help each other in every way possible.

In our study of the numerous problems of our business we are left almost wholly to our own resources. Since the abolishment of the State Experiment Station at Cranmoor our only outside assistance has come through an occasional visit by a Federal man from Washington or through the generous cooperation of the State Entomologist. During a part of the summer of 1922 the State Entomologist sent Mr. Malde into the field to assist us in combating the cranberry insects and most of us feel that a great deal of good was accomplished. But the funds for the purpose were very limited and we have tried to devise a better method of securing assistance from the state. In view of the fact that we contribute our share to the state treasury by way of taxes and we are not assisted by any of the forms of state aid that are available to the farmers and fruit growers of the state, it is no more than fair to assume that if we make a proper application for assistance it will be given. Dr. Fracker has stated that if we unite

on some reasonable course of action and present it to the Legislature or Department of Agriculture, he feels very sure that we will secure adequate help. So it has been proposed that we ask the Legislature for a modest appropriation to enable us to have a field man among us for six months of the year, he to advise with the growers on insect problems especially, weather data, and in other ways that would be of great benefit. Dr. Fracker has been a very good friend to us for several years and he has come here to our meeting to assist us in crystallizing our views and getting into shape whatever measures we decide to inaugurate today.

We are also most fortunate to have with us Dr. H. J. Franklin of the Cranberry Experiment Station of East Wareham, Mass., who will talk to us. Most of us met Dr. Franklin when he addressed our meeting in 1909 at the Gaynor marsh. Since 1910 he has spent his entire time in scientific investigations of one phase or another of the cranberry industry on Cape Cod. He conducts the State Bog of about fifteen acres at East Wareham, he has a very fine laboratory adjacent to this bog and his work and studies at this point and out among the growers of the Cape district has resulted in great good to the growers of the Cape district. He has won the position of being everywhere recognized as the best scientific authority in the cranberry industry today.

Dr. Franklin complimented us last evening on our new innovation, namely the banquet, and we are safe, I believe, in making this an annual event on the evening before the meeting. Mrs. Whittlesey is to be congratulated for looking after the general arrangements and Mr. Guy Nash for securing the speakers.

OBSERVATIONS DURING 1922

O. G. Malde.

I wish you a prosperous meeting, and hope it will establish as high a record among all your gatherings as did the last season's crop compare to other seasons' crops.

Your problems are many and complicated, and only by united effort and a solid front can you in any measurable degree get at a solution or effect a remedy.

My report to your president last summer covers quite well my summing up of my season's part-time work on the cranberry insect survey together with some recommendations for some needed action in improving and controlling several adverse factors active in the cranberry industry of this state.

Speaking of the high record of the state crop, I wonder if you are all aware records have been broken. This was the largest Wisconsin crop from cultivated bogs; the largest yield per acre *on large acreage* ever recorded in the United States was attained near Phillips; the largest fireworm damage on cultivated bogs in this state also occurred, of which we have any definite knowledge (this was due to (1) insuffi-

cient water, (2) inadequate ditches and flooding facilities, and (3) laxity of bog management).

The effects of cold nights, of frost and near frost conditions on various cranberry areas were the most definite I have ever observed, and only strengthen my conviction that to a large extent cold nights in blossom time with near frost conditions, or frost, with late or tardy application of water protection, is the cause of much of our so-called blossom blight; and convinces me further that we do not yet put sufficient stress on cranberry crop protection in attempting to maintain temperature above 40 F. during the period of hooking, blossoming and fruit setting, and it further seems to me much must be learned along this line before we can hope to secure a uniformly large crop all over the state.

If every grower will honestly analyze his own bog management and conditions and his own cranberry crop of last year, I think the evidence will show the best crops were obtained on the cleanest, best sanded and in general best husbanded bogs.

In the case of very grassy bogs otherwise hard to protect properly, I think it will also be found that the bogs with the largest and cleanest ditches and where most frequent protection was given, will show crops surpassing those on bogs less well cared for or where protection was given only when near frost temperatures were reached. I cannot overemphasize this point for it takes toll every season. General crop results last fall should be an inspiration for the early cleaning up of every below par bog.

It is significant to note that in Wisconsin a cranberry bog does not always mean peat soil only, for the continued success of Mr. Edward Hableman of Tunnel City on Dunning Sand indicates possibilities on areas of this type of soil in the northern half of Wisconsin where other essential requirements are present. I believe this type of soil is much the same as New Jersey Savannah soil. This I would term "hard bottom" as distinguished from bogs built chiefly on peat soils.

It is of interest to note that Mr. Hableman has obtained excellent results from fertilizer supplied by the droppings from a very large flock of chickens.

The past season with its late long warm weather seemed very favorable for some of the cranberry insects to get into good winter quarters, and we may expect many to be combatted next season. Everyone who did not get dams in shape to be able to completely submerge the vines next spring should do all possible this winter to give a complete insect flood for the first brood of fireworm.

I have no hesitancy in urging you collectively to work for legislation securing equality and rights in use of dredged ditch and creek waters for irrigation.

The pumping test by all odds should be continued until definite results as to getting water from wells are obtained.

I think there are great possibilities in further trial of methods of frost protection on cranberry bogs other than flooding, especially for the budding, blossoming and fruit-setting period.

Your success in securing good price for your fruit the past few seasons when other crops have been tobogganning on the market, it seems to me, should show you the advantage of cooperative action in all your endeavors. To do this some personal prejudices and differences must be cast off by all for the good of all. Thus in the broader view of cooperative welfare for the industry and yourself you should be able to gain much the coming year, from results obtained and lessons learned the past season.

DISCUSSION

Dr. Franklin was requested to tell of the experiments in frost protection at the Massachusetts station. Tobacco cloth must be used double or treble thickness for protection, is expensive and impermanent, and supporting framework is also expensive and apt to get out of order. Smoke pots or oil heaters are expensive, and refilling is sure to slop some crude oil on the vines, which die and stay dead, bare spot not being covered for a considerable time. Skinner spray system also is unsatisfactory. Flooding by water is best and cheapest method of frost protection.

ADDRESS

DR. H. J. FRANKLIN,

Superintendent of the Massachusetts Cranberry Experiment Station.

Cranberry Growers of Wisconsin:

Ladies and Gentlemen—While I talk, I want you to remember I never have had a chance to inform myself at all fully about the peculiarities connected with your industry here, and if I seem to make some rash statements, I trust you will forgive me on that account.

As I tried to make clear in my talk last night, it is your duty to yourselves and your children, to your state also, and the nation, not only to make the business of cranberry growing profitable but also to make it as interesting as possible. Most of us of course have found it a fascinating line of endeavor anyway, but it can be made still more attractive by increasing our knowledge of it.

In this connection, I want to impress on you the fact that you must not try to pattern your industry here after that in any other cranberry growing section. Each section must work out its own methods. Differences in climate, in water supplies, in sand supplies, in pests and possibly in the soil make this necessary. The Wisconsin cranberry section is more spread out than any other and I think there must be a great variation in conditions even within it on this account.

To properly develop your industry and adapt it rightly to your natural conditions you need to conduct scientific investigations for a long term of years. To do this rightly you need leadership. To supply such leadership is the function of an experiment station. You had such a

station for several years and I followed its work with interest. I feel sure that in its weather, variety, insect and culture studies it was in general working along right lines. I am sorry this work was given up.

I judge that considerable obstacles are still in the way of properly organizing an experiment station. If this is the case, I suggest that you substitute for it your own organized effort as far as possible. I think an experimental committee of cranberry growers could do much interesting work with occasional hints and instructions from the scientific men at Madison. I am sure that Prof. Fracker and his associates are always ready to help in any way they can.

To show you how much methods must depend on natural conditions I want to discuss briefly some of the more notable differences between the New Jersey and the Cape Cod cranberry sections.

It seems generally to be thought that cranberries should be grown as intensively as possible, because that is the way it is done in Massachusetts where the most cranberries are grown. But while our bogs are attractive in appearance and productive, you must not forget that they represent a large investment. Our "overhead," therefore, is great. They do not try to build their bogs so well in New Jersey, nor do they try to keep them in as good condition as we do. We sand; they do not. We try to grade to a level; they do not. We weed thoroughly and they do not. And for their conditions I think they are right. If they sanded, their berries probably would rot worse than they do now and they probably would find it impossible to spray to control their diseases because sprays with metallic poisons such as copper (a part of Bordeaux mixture) and arsenic commonly cause a serious cumulative injury to the cranberry root system on sanded areas.

In estimating the degree of our success in cranberry growing we must get over reckoning our returns by the acre and consider the percentage return on capital invested instead. Reckoning on this basis, I question if many New Jersey growers haven't beaten us in Massachusetts the last few years.

I do not know enough about your conditions here to pretend to say definitely whether you should grow cranberries intensively or extensively, whether you should sand or not sand, but I think I may properly raise the question; are you sure that you come anywhere near making the most of all the factors that enter into the cranberry growing game as they present themselves under your conditions?

A matter of great importance in the growing of any crop is that of

Varieties

I think those who had charge of your experiment station were wise in giving much attention to this.

It has interested me to note that you have given preference to one of our eastern varieties (the McFarlin) that has found only moderate and passing favor with us, while you have planted our standard varieties, the Early Black and Howes, but little. I do not doubt that your attitude toward our varieties is justified fully by your conditions.

I understand that you feel pretty well satisfied with some of your native varieties, but I want to suggest that you try growing the Pride and the Wales Henry. These are two little known but promising Massachusetts varieties. I think your president and Mr. Gebhardt already have planted small areas with the Pride. This is our most productive variety. It yields a third more than the Early Black. It is a mid-season variety, ripening after the Early Black and before the Howes. Its fruit keeps well and it usually sells for about a dollar a barrel less than Howes berries. Unfortunately, its berries are uneven in size and its vines are hard to scoop.

The Wales Henry is a mid-season variety. Its berries are somewhat larger than the Howes, are round in shape and even in size, and they keep well. It is about as productive as the Early Black and its vines scoop easily.

I suppose you always are interested in

Cranberry Insects

I will discuss briefly, therefore, the methods of checking your two chief pests.

I treat the fruit worm by holding the winter flowage late (until May 20 or later in Massachusetts) every other year and by flooding for two full weeks right after picking. The fall flooding must begin before the first of October with us and must be complete. I consider these two treatments about equally effective. They are based on the fact that the fruit worms in their cocoons cannot endure continued submergence with the water temperature relatively high. They seem to endure submergence as long as the water temperature remains near freezing.

I think you may find this insect harder to control than we do, because many of you divide your bogs with dams a good deal. These dams often may serve as refuges for some of the worms. I suggest that you have no more dams than you need.

As your growing season is shorter than ours, you may find it hard to work in the after-picking flood satisfactorily.

We treat the black-head fireworm by reflowing where we can because it is easy and seems cheap, but I want to remind you that much harm can be done with water. I have ruined two crops at our station bog since I have had charge of it by reflowing. So much harm has been done in Massachusetts in this way the last few years that some of our experienced growers are tending to depend less on flooding and more on spraying to control the fireworm.

I recommend that the reflow for this pest be maintained 24 hours in very warm weather and 40 to 44 hours in cool weather, but if it becomes cloudy or the water is dark and from a swamp reservoir, the time should be 12 to 20 hours, according to circumstances. The vines are less likely to be hurt if the weather is clear while the water is on. This is due to the fact that strong sunlight is necessary to the process of photosynthesis by which the plants tend to maintain a normal supply of oxygen in the water. Cloudiness with a high water temperature is

especially dangerous, for the higher the temperature the faster the plants respire and the greater their need of oxygen.

With us the fireworm flooding usually should be done the first week in June, but if the pest hatches early and the infestation is severe it should be done the last week in May and be repeated in June. Of course, if we let off the winter water late the reflowing is correspondingly late.

We often have controlled the fireworm most satisfactorily, especially on our large bogs, by bunching the hatching of the eggs, by holding the winter water until the first of June, and then reflooding three weeks later.

Late holding of the winter water seems to partly control the fireworm, probably because it increases the tendency of the second brood eggs to be suppressed in their hatching by shortening the active season of the pest.

On the other hand, a reflow in the latter part of May, with only a small percentage of the fireworm eggs hatched, tends to worsen an infestation because it kills or drives ashore all the fireworm's natural enemies that may have come onto the bog since the removal of the winter flood.

We feel that in spraying we must do the work thoroughly and must use one part of the Black Leaf 40 in 400 parts of water with two pounds of fish-oil soap added for every 50 gallons. Whether you treat this pest by flooding or by spraying, it is more important to give careful attention to the first part of either brood than it is to the last part and more important to treat the first brood than the second. This is due mainly to the fact that in most seasons the hatching of the latter part of the second brood is more or less suppressed and it is the latter part of the first brood naturally that lays the eggs from which the latter part of the second brood hatches. Those eggs of the second brood which are suppressed in their hatching often, and I suspect usually, fail to go through the following winter to hatch the next year.

It may interest you to know that we discovered a new fireworm disease last summer which was so epidemic on some bogs that it controlled the pest almost perfectly. We have the fungus that caused the disease growing on canned herring and so are carrying it over to next summer to see if we can make use of it against the fireworm in a spray.

I suppose you all are interested in

Cranberry Storage

We have been studying this for several years. The main general item to be considered in storing cranberries is temperature. Some ventilation is of course necessary, but this is less important than the maintenance of a low temperature. Very free ventilation with a high or medium temperature causes much loss from size-shrinkage of the sound berries. The lower the temperature the less need there is for ventilation because of the slower respiration of the berries. You can

get your low temperatures by ventilating if your storehouse is tightly constructed. Keep it close shut on damp and on warm days and air it well on cold nights, if necessary with fans. Open sheds are cheap and make fair storage. Cold storage for this fruit never has been tested thoroughly.

We tested your water-raking methods this fall, but found them too harmful to the keeping quality of the fruit in our climate.

We find that cranberries picked late in the afternoon keep much better than those gathered in the heat of the day. Therefore, it is best to pick the more tender berries toward sunset.

Finally, I want to give you a word of good cheer. Very little new bog has been planted since 1914 and little new planting is in prospect because of the continued high cost of labor. Because of this and of the much larger market we now enjoy, good cranberry bogs are sure to be excellent investments for the next ten years. This may not be a time to build bogs, but it is a time to buy, not to sell, them. Congratulate yourselves! You are lucky to be cranberry growers these days!

CRANBERRY INSECT SURVEY

DR. S. B. FRACKER, *State Entomologist*,

Madison, Wisconsin.

It is a particular satisfaction to address an agricultural organization whose members have the air of prosperity the cranberry growers show this season. You are to be particularly congratulated on the causes from which this feeling has developed. Various other producers have held conferences this winter but in almost every case there has been an attitude of a courageous attempt to look on the bright side of a bad situation and hope for better times in the future. Bumper production in many lines has resulted almost in bankruptcy for the producers because of inability to market the crops profitably.

The cranberry growers are in a very fortunate position in this regard. The crop of 1922 particularly in some districts will perhaps be for many years to come one which will act as a goal to strive toward. Such crops in many lines result in a flooded market, very deflated prices, and ruin and discouragement for the grower. Through effective business organization and careful marketing methods this has not been true in the case of cranberries and while consumers are nowhere complaining about the high price of the fruit the producer has been able to secure an amount which makes his bog unquestionably profitable.

There has been a marked tendency during recent years to say to those who are discussing improved methods of production that their time is wasted, that we cannot now sell all we produce and that further efforts along this line are useless until the methods of marketing are

improved. I feel especially fortunate this afternoon in discussing methods of improved production with an audience which is not in this frame of mind, with a group which seems to have solved the marketing problem to such an extent that overproduction in the immediate future seems unlikely. The cranberry growers are thereby able to face the problems of insect control with a superb optimism which comes from the successful solution of what is probably the most complicated and distressing of all agricultural problems, that of a profitable disposal of the crop.

Before discussing the results of the insect pest survey during the past summer it may be worth while to glance backward a moment at the development which led up to it. About 1908 there were so many unsolved problems in connection with cranberry production that the growers asked the University of Wisconsin to establish a cranberry experiment station for the study of varieties, and cultural methods for insect control. Partly in order that these problems might be investigated by someone who was not biased by the habitual crop production methods in cranberry growing. a member of the Horticultural Department of the University who had no previous experience with this kind of fruit was assigned to the task. During the ten years that the experiment station was kept up, Mr. O. G. Malde had charge and the work of the station was unquestionably of great value to the cranberry growers.

During this period many of the principal problems were solved. Several varieties showing particular value on the experiment station plats have since been adopted for large scale planting. Control measures were worked out for most of the principal insect pests and plant diseases and several of the disputed cultural methods were tried out and their benefits and disadvantages shown.

When, after the expiration of the ten-year period, the University was unable to renew the lease on the land used for this purpose it was felt by the growers that most of their serious problems had been solved. During the four seasons from 1918 to 1921, inclusive, the insect control problem proved to be a very serious one and in the absence of an experiment station there was no one to help in their solution. Although control measures for both the fireworm and the fruitworm had been worked out, the cranberry growers found themselves unable to time these control measures accurately or to determine their nature and distribution soon enough to be of value. After the season of 1921 these facts had become so apparent and so serious that the officers of the association held a special meeting in March, 1922, to consider a method of improving the situation. The result of this meeting seems to have been a decision that the methods used in such projects as grasshopper control offered the best promise of results. The president and secretary, therefore, wrote the state entomologist for suggestions.

No funds for adequate work of this kind could be secured at as late a time as that but the Department of Agriculture was able to put on a man for half time between the middle of May and the end

of August. Mr. Malde was secured for this purpose. He made several complete tours of practically all the cranberry areas of the state, the results of which are published in the report of the department of agriculture.

Mr. Malde's most important contribution to the success of the bumper crop for the season was in connection with the infestation of the black-headed fireworm (Rhopobota naevena). This was discovered in the first bog visited on May 18 and as the survey continued from Tomah through the Warrens and Cranmoor districts this insect was found present on practically every bog. In three-fourths of the cases the cranberry growers had not yet discovered its work and most of them applied immediate control measures as soon as the danger was pointed out. In fact, our impression is that all the principal cranberry bogs in the state except one applied the measures recommended and on that one the crop was unforunately an almost total loss.

In order to be sure that the recommendations would reach the growers in time, even before the survey was completed a circular letter was sent to all of the cranberry producers on May 25 recommending that all the bogs in the state be given a thirty-six hour submergence immediately while the water was still cool. As a result of the general adoption of this recommendation the second brood of the fireworm in midsummer was quite scarce instead of reaching the very serious proportions it would have if the first brood had not been adequately controlled.

The insect second in importance during the past summer was the cranberry fruitworm, but the limitations during the season were such that Mr. Malde was unable to be of as much assistance in combating this pest as he would have if he had been able to put in the entire six months' growing season with the cranberry growers. As you know, midsummer control measures for the fruitworm are not of as much value as those which can be applied in the fall.

Other insect pests of importance were the tip-worm and the oblique-banded leafroller. The yellow-headed fireworm and the false yellow-headed fireworm as well as leafhoppers and several insects of lesser importance were present.

Fortunately, the false blossom condition does not seem to be spreading materially and its distribution is held in check to some extent by close nursery inspection regulations.

For the future progress of the work several possibilities are before the growers. If a re-establishment of the experiment station is desired perhaps arrangements could be made for that by taking up the matter again with the regents of the University. In view, however, of the success of the insect survey work during the past season the state department feels that it will be glad to cooperate with the cranberry growers along the same line in the future if desired. Perhaps the most satisfactory way of handling the whole situation would be for the department and the growers to carry it on on the cooperative basis, using in part funds of the association and in part those of the

department. This would make it possible for the growers to keep in direct touch with the work at all times in this way, making sure that it is being carried on in a way that will be most valuable to them.

The department is not organized for experimental purposes and could not undertake experimental projects. If, however, you wish the work to be placed on the basis of control of insect outbreaks, in which specialists study conditions from year to year and report to the individual growers the best methods of preventing losses from insects and plant diseases, the department will always be ready to assist to the extent of our resources. In order to secure adequate results a specialist should be employed for his entire time for at least six months a year and perhaps throughout the entire year, if funds to a sufficiently large amount are made available.

TOASTS

Four Toasts were responded to at the Cranberry Banquet which to some extent epitomize the history of cranberry culture in Wisconsin, from the early days when all berries were "Wild" and all were "Natives," to the past season with its great harvest from the new cultivated bogs in the northern portion of the state.

PIONEER CRANBERRYING

S. N. WHITTLESEY.

Pioneering probably suggests to our minds hardships and hopes—lots of them. I would enjoy telling you a few personal experiences and I hope you may enjoy them, too.

Strange as it may seem now I was once young. My young existence was first discovered down in Unionville, Conn., in the year 1849, the same year gold was discovered in California. Connecticut and California were a long way apart in the early days. There was no getting across except by prairie schooner—you could go only as far as Chicago on a railroad.

It was some twenty years later that cranberries were discovered in Wisconsin. They may have been old on Cape Cod. In the twenty years after 1849 considerable happened in this country of ours. We fought a long civil war; we liberated four million slaves; we built a transcontinental railroad from the Atlantic to the Pacific coast—and I grew up. I had ambitions. One was to go to Washington territory and homestead 160 acres of Uncle Sam's fabulous forests; all you had to do was to cut up those gigantic trees and roll them down hill into Puget Sound.

It so happened that my father located in Berlin, Wis., and I went to see him before starting for Washington territory. Eight or ten miles north of Berlin there lived a family of Irishmen named Carey—

father and four or five sons. They owned a large patch of worthless marsh and some timberland. They lived by selling cordwood but in the late sixties were getting cranberries. In 1870 they got 10,000 barrels and sold them for $100,000, almost as unbelievable as the performance this year on Mr. Albert Hedler's marsh at Phillips.* The fame of the Carey crop spread; marsh lands became considered bonanzas. My father bought forty acres joining the Carey's and I helped him plant it. We boarded with an old farmer on Shed's Island by the name of John Balch. Balch told us that he knew of thousands of acres of cranberry marsh—wild—as good as Carey's and I arranged with him to go after it.

We left Berlin late in November, 1870, with a team of horses and lumber wagon, drove west through Friendship, crossed the Wisconsin river at Petenwell on a ferry, turning north at Necedah and following the lumber trail of the Weston, Kingston & Miner Company to Thompson's Landing, a point on the west bank of the Yellow river between where Finley and Babcock now are. Thanksgiving morning, 1870, Balch and Thompson—old seasoned cruisers—and I, a verdant tenderfoot, started west afoot toward South Bluff in search of the cranberry Eldorado. The water was a foot deep over the marshes and the ice about one inch thick over the water. We each carried a gun—everybody lived on venison there. We came to an island covered with timber, the very island the J. Q. Daniels house stands on now. The old hunters took up the edges and sent the tenderfoot up the center barking like a dog, drive out the game. We did not connect at the end of the island and I waited for my companions, waited an hour, and then I decided they were lost. I thought I knew where I was. I could see South Bluff. I went over to it, a long tramp. I found acres of cranberry vines and berries under that crust of ice and cold; famished and wet as I was, there kindled in my breast a dream of avarice. The sinking sun warned me that I better hike for camp. Daylight was soon gone. The thin ice broke under me in deepest water. I had no coat. My frozen trousers sounded like stovepipes bumping together. I stumbled on till after midnight then I built a fire with matches located luckily above high water mark. It does not seem so terrible now but as I sat shivering there waiting for daylight I thought Robinson Crusoe had nothing on me. I got back to camp before noon next day and Mrs. Thompson filled me with sweet sympathy and venison steak.

Balch and I bought ten forties of that marsh and I went back there in the spring of 1871 and planted all my cash, $800, built ditches, dams and roadways, cooked for the crowd and set the pace at work. Before summer was over suspicion grew to conviction that I had picked the wrong place and the wrong partner. I sold out to Balch, gave him a deed to my half and took his note for $800. Then I got a surprise. Balch sued me for $800, said to be my arrears on expenses in this

*The Cranberry Lake Development Company's bog near Phillips, Wis., raised 11,097 barrels of Searles Jumbo cranberries on a little less than 83 acres of vines. Mr. Hedler is secretary and manager of the company.—Secretary.

venture. I lost in the gamble before the justice and went out with no money and no marsh. While I was feeling the pangs of bankruptcy an old surveyor named Hank Beatty came along and he said, "Stop snivelling, Bub. I can show you lots better marsh than what you lost." I went with Hank Beatty and he showed me the marsh I now own—got the descriptions for me gratis. He was a prince. I called my father and we bought in company about the middle of August. I went to Necedah and got a load of lumber and some ditching tools, intending to build a house and get ready to harvest the cranberries on our new marsh. Getting back about dark one day late in August with my load of lumber, etc., I was surprised to find the place already occupied and my right there disputed. I heard the rumble of a wagon all night and at daylight I followed its track a mile or two and found over 100 bushels of cranberries in sacks and Wilkes Lewis sitting on top with a gun. I claimed ownership of those cranberries and the land they were gathered from, but I had to admit that Wilkes had the drop on me and the best of the argument and I would have to wait till my turn came. We built the house, dug some ditches, watched over the patches of cranberries that were left and all that saved us from being lynched was our lumber and ditching tools, for nobody ever before went into that country with anything but a cranberry rake and a sack.

We hired Tommy Cummings, the Jameses, Eli Taylor, Dick Shay and Mike Mason, Sr., at $1 a bushel and they raked in 150 barrels for us and they made $25 a day, better money than stealing berries. So we established peaceable possession and we enjoy it yet. We hauled to Berlin until H. W. Remington came along with the Wisconsin Valley Railroad by our door a year or two later.

HARD TIMES

M. O. Potter.

Like Mr. Whittlesey and a good many other of the early cranberry growers of this part of Wisconsin, I drew my inspiration from Berlin, Wisconsin, way, where the wonderful crops of the Carey's and others were raised.

I started growing cranberries in 1872, more than fifty years ago, when I was nineteen years old. To start with, all the cranberry marshes were wild, and the grower simply put in ditches and dikes at what seemed to him good places, so as to make reservoirs to store water and some chance to control it. The bogs were deep masses of cranberry vines and other vegetation eighteen inches to two or three feet thick, and would sink down three or four inches at every step, while in some places the bogs were floating. Of course crops were very uncertain; some years when conditions were right and frost held off or water was plenty in the reservoirs, the yield would be phenomenal, and other years would scarcely pay expenses. The high

point was reached in the summer of 1893, when on the first of August the Wisconsin crop was estimated at 120,000 barrels. It wasn't estimated so high a month later, for a week of big frosts came before the month of August was over and caught practically every grower without water, so the actual yield was only 24,000 barrels from the St. Paul and Green Bay railroads.

The years 1891 and 1892 were dry and pretty well dried out the marshes; 1893 was still drier, and the mat of vines got good and dry. On the fifteenth day of September, 1893, the marshes around Cranmoor Station, then known as Bearss Marsh, burned in the morning. From Bennett's Island fire jumped three quarters of a mile; we always supposed the wind must have carried a sizable limb, afire, from the top of some poplar tree. Anyhow the fire burned me out. The years from 1891 to 1897 were all dry years.

We levelled the knolls on twenty-one acres in the fall of 1893 and planted it in 1894. Scarcely any vines were left on my marsh so I had to buy nearly all the vines. Eighteen hundred ninety-four was very dry; there was scarcely any grass growing, and almost any hot day you could see whirlwinds picking up the ashes and dust from the fire of the year before and carry them sky high. This was another bad year for fires, and the planting done in the spring all burned out.

In the fall of 1894 I plowed seventeen acres and dragged and pulverized it and planted it in the spring of 1895. Nine-tenths of this planting was lost. In 1896 six acres were planted and a little in 1897.

The first crop after the big fire was in 1898 and was only 50 barrels; 1899 was not much better, 86 barrels, which sold at $5.37 per barrel. In 1900 we got 372 barrels and in 1901 the first good crop, 1,041 barrels, which sold for $5.75 per barrel. This was eight years after the fire. From that time on the crop varied with the season, from 306 barrels in the dry year of 1911 to 1,500 barrels in 1912, which sold for $6.07 per barrel. In 1914, the year of the big crop for the whole country, the two marshes (my own was combined that year with the adjoining marshes of my sons) raised 1,000 barrels and the price was $4.37 per barrel. The average for the last six years has been 1,850 barrels, or leaving out the crop of 1920, which was only 588 barrels, as a result of holding the water too long while flooding for fireworm, the average for the other five years is 2,100 barrels.

The hard times from the fire in 1893 till the marsh started bearing again in 1900 and 1901 don't seem so hard while talking about the crop of these last years, but they were mighty tough to live through, and I can't see now how we did it. The farm in Rudolph was a cost instead of a help, for those were poverty days in farming. I was getting fifty dollars a month rent for the hotel in Wisconsin Rapids, which was then Centralia, and that had to support the family, rebuild the marsh and pay taxes on the marsh and farm and hotel. Of course labor didn't cost much; you could get a man for 50 cents per day and a boy for 25 cents per day and board. They worked from six in the morning till six at night with an hour for dinner at noon, and it was

work and no fooling, for they were afraid of losing their jobs. I did a lot of the work with my own hands.

This was my experience and the experience of my family. Other growers were having their troubles, too, although I don't think any of them had any worse a time. Some marshes were burned over and the vines destroyed and so dried out by the series of drouth years that they never were replanted to cranberries. Others were not burned but suffered from the dry years. Others replanted and gradually the industry changed over from the haphazard wild bogs to the present system of cultivated marshes.

THE TRANSITION ERA

ANDREW SEARLS.

It is something like fifty years since I embarked in this cranberry growing industry, and I have seen all of these changes mentioned. I have seen this industry emerge from a state of the worst kind of a gamble into one of the surest, safest crops grown in our state. This transformation has not been rapid but has come up through great travail. We all had heard of the immense crops of berries grown in the Berlin district without the outlay of any great amount of money, only a few ditches to be dug and some patient waiting. We all bought many broad acres, dug many ditches and put in many days of weary waiting only to find we must go farther and do some better thinking than had been done. Then we thought we had found the highway to success, we would scalp and plant. Mr. James Gaynor invented a plow to undercut the sod, which was removed, and the cranberry vines planted upon this clean soil. At this period little care was shown in selecting varieties for was not a cranberry a cranberry in the market? So the average grower went out into the wilderness and gathered in the wild vine, and planted it.

It was thought cranberries planted upon ground so prepared were immune from frost but it required only a few years to show this to be a mistake, for mosses soon made their appearance and grasses seemed to thrive a little better than they had before the planting had taken place, and Jack Frost was found to be as deadly as ever in his attacks upon our crops; only water could save the berries, so reservoirs were built to store up water in times of plenty, to be used in times of scarcity.

Judge John A. Gaynor should receive great credit for keeping the growers of cranberries heartened up; he was a firm believer in the ultimate success of the cranberry industry. During a term in the legislature, Judge Gaynor got a bill passed granting a small appropriation for this association. Three small experimental stations were established which were afterwards consolidated into one station, where the first acre of cranberries were planted upon sanded ground, the at-

tempt was made to establish varieties, and the association had over a hundred varieties growing upon this experimental station. An attempt was made to establish a complete record of each variety, its keeping qualities as well as its other characteristics. This labor was discontinued when the university took charge. I think this was a great mistake. We lost many valuable varieties, as most of the different varieties growing upon the experimental station were varieties selected from the native wild stock and would have been likely to have shown greater adaptability than plants brought from Cape Cod or New Jersey.

In the early days of the cranberry growing little care was taken to have the fields level. Today we are careful to have the fields as nearly level as may be, all vegetation thoroughly subdued through an application of sand, when it is ready to receive the cranberry plants.

The selection of a location upon which to build a cranberry bog, receives today a very much more critical inspection than it did forty years ago. Today a close inspection of its water supply, its supply of the proper grade of sand near at hand, its proper drainage, its soil receives its test for suitability to grow cranberries.

When these conditions are all favorable and a man has a reasonable knowledge of the business, the growing of crops of cranberries is much more certain than that of corn, wheat, oats or potatoes.

Our methods of harvesting cranberries have undergone as great a change as has the growing of the crop. In an early day most cranberries were hand picked at an expense of from 64 cents per bushel to $1.00 per bushel or even more. Today we scoop all of our cranberries at an average expense not to exceed 10 cents per bushel.

WHEN DREAMS COME TRUE

F. R. Barber.

We are all dreamers more or less. There are dreams of various kinds, but my theme will be simply the dreams of cranberry growers and their realization. We have heard the stirring tales of hardship and adventure from the lips of pioneer growers who have spoken, and are impressed again with the courage of those who blazed the way in the face of great hardship, and established a great and growing industry in the state.

We have all experienced difficulties in the past and many of our dreams have been slow in realization, but the year 1922 marks the date when some, at least, of the fond dreams of Wisconsin cranberry growers have come true. One bog near Phillips produced a record-breaking crop, and we regret the absence of Mr. Hedler who was to have told us about it. This particular bog yielded an average of almost 150 barrels of fancy cranberries to the acre on a total area of about 80 acres of vines. This crop sold for over $130,000 and sets a

record, I believe, for high average yield on a large acreage. While we may not be able to do as well where conditions are different, we can all keep our eye on this high mark and do our very best.

A fair crop was produced on practically every cultivated bog in the state, and we had fine weather for harvesting, with a good, steady market for the fruit. The selling has been done in a manner reflecting great credit on the organizations and persons responsible for this important service, and Wisconsin growers as a rule got every cent their crops were worth.

Another dream has come true since Wisconsin cranberries are now appreciated at their true worth in the various markets, which has not always been the case. For years we have been trying to impress upon the public the superior quality of Wisconsin cranberries and have advertised our product as "Wisconsin Grown" and contested the claim so often made that the best berries came from the East. This year we learn that Wisconsin cranberries have been considered the best on the market and have sold more largely than ever before in our natural territory.

The financial situation as regards the cranberry industry has also undergone a change. There have been times when it was almost impossible to borrow money even to harvest a crop, but we have been able to finance the harvesting this year, thanks to those who have had confidence in this business. Further improvement in this direction may be hoped for, and I dream of a time when cranberry properties may be considered on a par with farms as a basis of security for long-time loans. We must stabilize the business by avoiding mistakes, and we must build our bogs on a solid foundation of scientific knowledge. Dreams of the future in connection with this industry will come true when we have learned to avoid mistakes in selecting locations for our cranberry bogs and when we adopt the best methods for harvesting, handling, packing and sell our product.

President C. L. Lewis, responding to the toast, "Joys of an Inspector," told of his experiences inspecting for the Sales Company during a year when the keeping quality of the eastern cranberry was extremely poor. The Wisconsin crop was, on the other hand, of excellent quality, so the Wisconsin berry gained a great prestige. Every grower should be most particular next year and in succeeding years with his pack, in order to maintain this prestige and convert it into dollars in his bank.

Dr. Franklin emphasized the desirable position in which the cranberry industry finds itself, making good profits at present and with every prospect of a continuation for several years at least. This being the case, every grower should be of good heart, and should not only strive for a present profit, but should endeavor to so conduct his operations that life will be broadening, interesting and vital to himself and those working with him.

OUR 1921 CROP*

ROY POTTER.

I have been asked by Mr. Whittlesey to read a paper on "How We Raised Our Last Year's Crop."

My father says that the reason we had a good crop last fall was the poor crop in 1920, the vines had a chance to rest. My brother says it was on account of the heat wave, for in the Mather district there was practically no crops, in the Cranmoor district a part crop, while in the north they all had large crops. However, I will tell how we took care of our marsh.

We took the winter flood off about the middle of April. We always plan to take the water off so the vines will have at least two nights without a frost. We find that removing the water from the marsh, and a frost following on the same night, we lose a large number of buds. The buds, while soaked, can not stand frost as well as when thoroughly dried.

Following Mr. Malde's advice our marsh has been deeply drained and all of it has been sanded from three to six times, averaging from one-fourth to one-half inch, so the vines are deeply rooted, protecting them from the intense heat we had this growing season.

Previous years during the summer months, when we thought the vines needed it, we raised the water up to the surface in the evening, in the morning drawing the water off so that there was no water on the surface during the warm part of the day.

Just before and after blossoming time we keep the water deeply drained, but during blossoming time we keep the water close to the surface, but this last season being out of water we could not do this, the result being a large crop of small berries. Why we feel that deep drainage has won us a crop this last season is that we have one-third acre that we could never drain more than six inches below the surface, and yielded less than one barrel and the vines are in very bad shape for the lack of moisture. This has also been sanded. You cannot change a marsh that has been kept wet to a deeply drained marsh in one year without hurting vines and crop.

We lost a large part of our crop by the big frost that came on June 3. We started flooding about six in the evening, but the water came too slow, not having enough head to force a winter flood on in so short a time—resulting in our losing about ten acres on the lower end.

This is about all the summer work we did, except that in 1920 we put what is called a summer flood on five acres to kill the grass. In summer flooding we find that by keeping the water from six to eight inches above the vines we get the best results. Just before the grass grew above the water we clipped it. We continued this work until the first of July. Then we took off the water. The results were remarkable, for before, those five acres had never yielded over ten barrels to the acre, and this year we got better than sixty barrels to an acre.

*This paper should have been in the thirty-fifth annual report.—Secretary.

FINANCIAL STATEMENT OF THE WISCONSIN STATE CRANBERRY GROWERS' ASSOCIATION FOR THE CALENDAR YEAR, 1922.

1922				
Jan.	1	Balance on hand	$447.70	
July	1	State appropriation	250.00	
		Dues collected	94.00	
Jan.	27	Prof. R. E. Vaughn's expenses		$ 13.58
Feb.	1	Clara L. Smith, clerical services		2.00
April	19	C. L. Lewis, expense to executive committee		15.55
		State Printing Board		201.83
May	12	Hein & Sutor Printing Co.		6.50
	15	Streissguth-Petran Eng. Co.		6.31
Oct.		State Printing Board		59.47
Nov.	1	Hein & Sutor Printing Co.		3.90
Dec.	20	Hein & Sutor Printing Co.		4.78
	31	Balance on hand		477.78
			$791.70	$791.70
1923				
Jan.	1	Balance on hand	$477.78	

SPECIAL PUMPING EXPERIMENT FUND

1921				
July	1	Special appropriation	$250.00	
1922				
July	1	Special appropriation	250.00	
Dec.	31	Balance on hand		$500.00
			$500.00	$500.00
1923				
Jan.	1	Balance on hand	500.00	

MRS. S. N. WHITTLESEY,
Secretary.

Report approved by Auditing Committee consisting of F. R. Barber, H. J. Gebhardt and Guy Nash.

WISCONSIN STATE CRANBERRY GROWERS' ASSOCIATION CONSTITUTION AND BY-LAWS

(As amended at the thirty-sixth annual meeting, January 9, 1923.)

Article 1. This association shall be known as the Wisconsin State Cranberry Growers' Association.

Article 2. The objects of the association shall be to advance the interests of all engaged in the cultivation of cranberries in this state by obtaining statistics and information of the condition of the crop in this and other states, from time to time; by establishing and taking measures to insure the use of uniform packages for marketing the fruit, so as to secure the confidence of dealers and purchasers by this evidence of fair and honorable dealing; to enlarge the area of the market for this fruit through definite and direct action; and generally, by all legitimate and honorable means to advance the interests of the cranberry cultivator.

Article 3. The officers of the association shall be a president and vice president and secretary and an executive committee composed of the president, vice president, secretary and two others, chosen annually by the members. The duties of president, vice president and secretary shall be such as are usually implied in like offices in sim-

ilar associations. All association funds shall be deposited with the state treasurer.

Article 4. There shall be an annual meeting on the second Tuesday of January of each year, for the election by ballot of officers and the transaction of general business.

Article 5. There shall be held on the first Tuesday after the 12th of August annually a convention to receive reports and to transact such other business as may come before it.

Article 6. The annual meetings, conventions and special meetings shall be held at such place as may be decided upon by the executive committee.

Article 7. Any person signing the constitution and paying $1.00 may be admitted as a member, and the annual dues shall be $1.00.

Article 8. This constitution may be amended at any annual meeting or convention by a vote of two-thirds of the members present.

BY-LAWS

1. The president shall preside at all meetings, and in his absence, the vice president.

2. Any company of growers may be represented by one or more of its officers.

3. A quorum of any committee shall consist of a majority of its members.

4. No disbursements shall be made except on order signed by the secretary, countersigned by the president.

5. As far as practicable Robert's Rules of Order shall be the rules of this association.

6. A quorum of the association shall consist of 10 per cent of its paid-up membership as shown on the book of the secretary, but shall not be less than ten members.