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Wisconsin State Cranberry Growers' Association. Forty-seventh annual meeting, Wisconsin Rapids, Wisconsin, December 14, 1933. Forty-seventh summer convention, Wisconsin Rapids, Wisconsin, August 8, 19...

Wisconsin State Cranberry Growers Association

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WISCONSIN STATE CRANBERRY GROWERS' ASSOCIATION

FORTY-SEVENTH ANNUAL MEETING

WISCONSIN RAPIDS, WISCONSIN

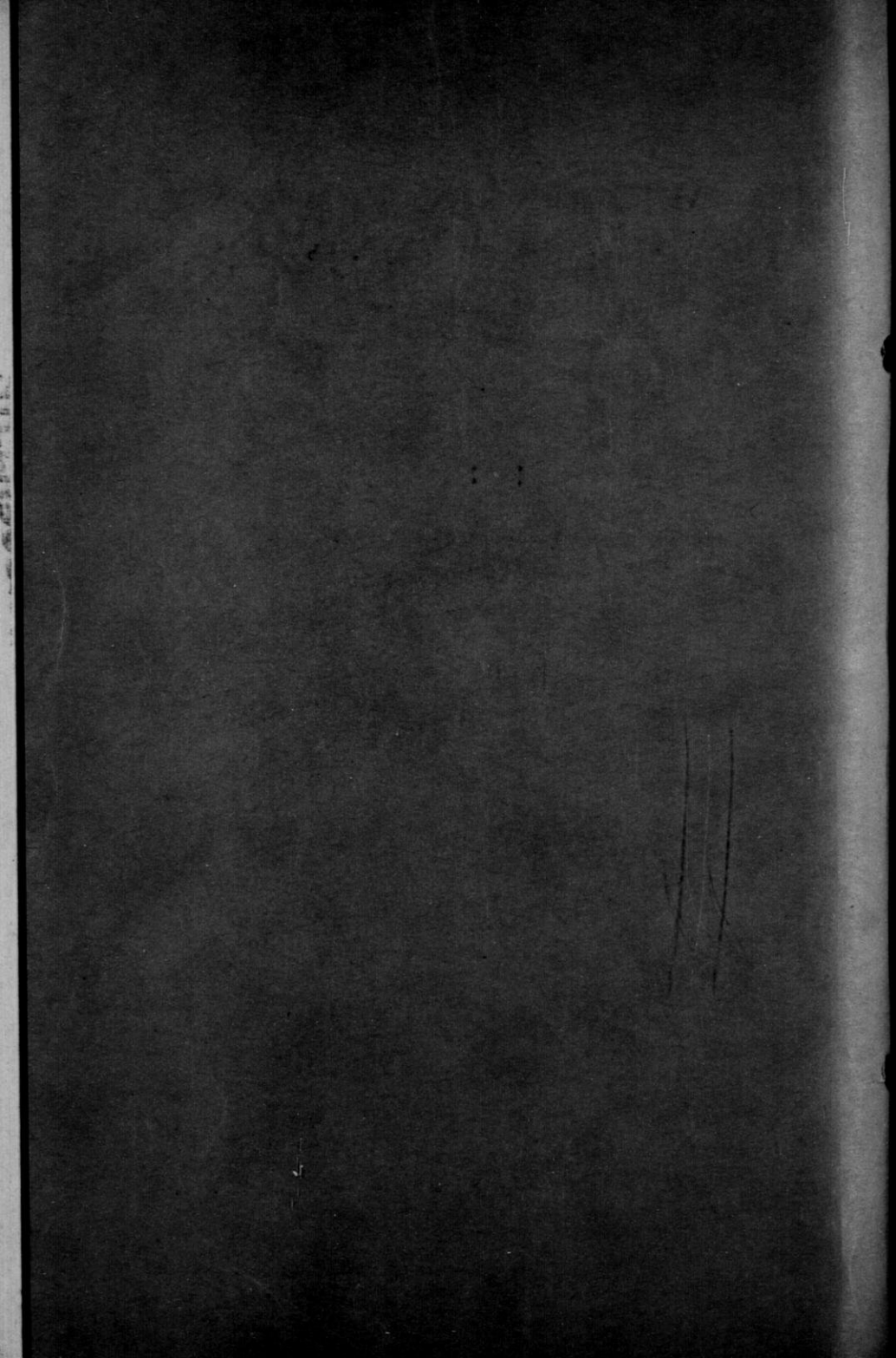
December 14, 1933



FORTY-SEVENTH SUMMER CONVENTION

WISCONSIN RAPIDS, WISCONSIN

August 8, 1933



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LETTER OF TRANSMITTAL

TO THE HONORABLE A. G. SCHMEDEMAN,
Governor of Wisconsin.

Dear Sir: I have the honor to submit to you herewith
the Forty-seventh Annual Report of the Wisconsin State
Cranberry Growers' Association.

Very Respectfully Yours,

CLARE S. SMITH,
Secretary.

Wisconsin Rapids, Wis., January 1, 1934.

MINUTES OF THE 47TH SUMMER MEETING

Meeting called to order at 2:15 P. M. at Realty Hall, Wisconsin Rapids, August 8, 1933.

President Herman Gebhardt extended a welcome to all growers and friends attending.

Mr. E. L. Chambers gave a talk on insect pests, ways and means to combat same.

Mr. H. F. Bain told of the cross pollinating work being done the past three years and illustrated with drawings.

Mr. L. M. Rogers gave a general survey of planting and reclamation of bogs for this state.

Mr. A. U. Chaney gave the crop report and Mr. C. M. Chaney spoke on market conditions. A. B. Scott reported on Compensation Insurance.

Mr. S. N. Whittlesey, the oldest living grower in the state, gave recollections of his pioneer days in the cranberry game.

Mr. Vernon Goldsworthy read a report of his study of Cranberry Problems of 1933.

Mr. W. Ebling spoke on his work as Agricultural Statistician.

Mr. A. B. Scott, chairman of the committee appointed to protest the licensing bill for cranberry growers, reported that a petition of protest had been sent to the finance committee and that he had heard that the bill had been killed in the committee.

The minutes were read and approved. Motion was made and seconded not to exhibit at the coming State and Wood Co. fairs. Motion made and seconded to extend our appreciation to Mr. Daniels for the candy and cigars.

It was voted to hold our next meeting on the first Wednesday in December.

Meeting adjourned.

CLARE S. SMITH,
Secretary.

ADDRESS

HERMAN GEBHARDT, *President*

I am glad to see so many growers and members of their families here this afternoon. Your being here tells far more clearly than I can express to you in words the fact that you are interested in your vocation, for the interest one manifests in his occupation determines to a great degree the success or failure that follows.

We have every reason to be proud of our vocation, for we produce a worthwhile commodity—a fruit that is said to rank high in health-giving qualities. Our work is in the great out-of-doors; we endeavor to work with Nature; we live more nearly as the Creator intended man to live—quite different from the life of the city cliff dweller.

We take a comparatively worthless piece of land and, applying labor and capital thereto, bring it to a high state of cultivation, adding that much more beauty to this planet and placing the land high on the assessment roll. Nevertheless, I sometimes feel that we have a duty, a responsibility, for the people of these United States look to us, the growers of the three producing states, Massachusetts, New Jersey and Wisconsin, to bring forth the little, red, tart berry so much desired on the festive occasions. And for this expenditure of labor, capital, and time, we have every right to expect a fair reasonable return for such expenditure. Personally, I view with regret that the economic condition of this young nation is such that the purchasing power of the masses is extremely low. I sometimes illustrate with five apples representing the wealth, and 100 people representing the population of the nation. The division as it is today, is that four very wealthy people have one apple each, while 96 of you must get as good a can from the remaining apple.

This Association is not a new organization; it has stood the test of many years, and I have the greatest respect and regard for those early pioneers who blazed the trail which we now tread with comparative ease. They gathered in the manner in which we meet here today to discuss their problems, having in mind the production of a better berry and a better pack. Pioneering in any line is not easy. It is within my recollection their trudging through the early morning dew over trails and corduroy roads that they might assemble at Barrs station, the Brooks marsh, the Mills marsh, or other suitable place—and got there on time.

To those of you who are guests or visitors, we want you to feel at home; we want you to feel that the time here spent has been profitable to you, and on behalf of the Association I extend you a hearty welcome.

1933 CROP ESTIMATE

MR. A. U. CHANEY

I didn't know I was on the program. I want to first speak for Dean Christensen. He telephoned me about noon time, because he didn't know who else to get in touch with, to express his regrets that he could not be here today. Some delegation of cheese people or something similar delayed him, and he thought up until ten o'clock that he would be able to get here. He said he simply couldn't make it, and asked me to express his apology and his appreciation of the invita-

tion. He said that as dean of the College of Agriculture, he was proud of the cranberry people of Wisconsin. I have known Dean Christensen about fifteen years and hold him in very high regard. He used to be the expert on cooperative marketing in the Department of Agriculture. He studied that feature of farm marketing in Denmark. He is one of the best scholars of that subject, I think, that this country possesses. I had the pleasure of serving with him in preparing a Congressional bill that created the division of cooperative marketing, of which he was afterwards made chief, and which was exceedingly helpful to cooperatives of this country. He went before the agricultural committee of this and recommended that if they would back the Division of Cooperative Marketing and educate the farmers on cooperative marketing they wouldn't need the Farm Board. I felt then that if the Farm Board was created, it would fail, but the emergency seemed so great they made the Farm Board and made the dean the secretary of it. Of course it fell flat, as I thought it would, and he is in Wisconsin now as dean of the College of Agriculture. I think he is the best authority the country has ever had on cooperative marketing. I am sure it would be a great pleasure and interesting for you to get him to talk to you some time.

I haven't much of a message for you today. I have had a nice long vacation, and am back on the job. I feel happy that I am back, and am hoping that I will be with you another quarter of a century. I am not an old man yet! My first thought the other day when I came into Wisconsin Rapids and crossed the new bridge was that just at this time thirty-three years ago this month I came here to attend one of your conventions—the first convention I attended. Then I was quite a young man—in my early twenties. I was supposed to hunt a man by the name of Gaynor, and left my grip to walk across the bridge to find him. I met a man with a horse and buggy on the bridge and inquired of him if he could tell me where to find Mr. Gaynor. He said, "I'm Gaynor; get in". So we drove out to the Gaynor marsh where you were having the meeting. I think it took two hours to make the trip. He talked all the way out and all the way back, which I enjoyed very much. This is the first year since then that I failed to get to Wisconsin Rapids at least twice. Have you ever been away from home, and had the "homecoming" feeling when you get back? I had the "homecoming" feeling when I got to Wisconsin. My health is coming back, and if God is willing, will still stick on my post and sell cranberries another quarter of a century. I have been off nine months; I don't want any more of it.

I can't tell you anything about marketing, because I am not in touch with it. I can tell you the crop seems to be about the same as it was three years ago. The Cape Cod estimate is 375,000 barrels. That estimate may not be very accurate, because the bogs are so spotted, and you know how hard it is to estimate a spotted crop. New Jersey has had a wonderful bloom, but they have had cold weather, and hot weather, then cold again, and hot again, and their bloom hung up a long time. It was still on a week ago on some bogs. They tell me it is growing less all the time. The group of growers met to establish a rate of pay to pickers the last week in March, and in checking up with that group, their own estimate of their crop was a thirty-five per cent increase, or 105,000 to 110,000 barrels in March against 75,000 last year. There has been no check-up in Wisconsin, but gathering information "catch as catch can", some of us guess—and it is only a guess—that the Wisconsin crop will be 40,000 barrels. The northwestern crop—also only a guess—may be 11,000 to 12,000 barrels. That is the present estimate. Lots of things can happen, however.

The fruit crop is also spotted. The apple crop will probably on the whole be the same as it was last year. It is a total failure in

some sections of the country, due to dry weather, aphids, and other things. The peach crop is spotted. The small fruit crop along the Ohio river and the Middlewest has been burned up, as have many other things in that dry area, so that there is less small fruit, apparently, on the market, unless a lot of others come on. That may favorably affect the market of cranberries.

My brother has been over the country, and has just returned from an extended trip to the coast, and he tells me that on his journey the sentiment of the people is hopeful that the president is putting something good over for all of us, and starting to pull us out of this depression, and we are all for the president if he can do it. Even though I have been a Republican, I feel politics is out. We will all be Democrats, I am sure, as long as we can improve conditions. We are hoping that with the improved price of cotton we will have a more favorable marketing program, and more money to buy cranberries. That is all I can tell you—we are just hopeful.

MARKET CONDITIONS

MR. C. M. CHANEY

I have always found it rather hard to enlarge on anything my brother has to say. The only way I can do that is to get the first chance, being younger—you may not think I am younger, but I am. I will have to resort to what I said this morning, to a certain extent.

It is true that I have recently made a trip across the central part of the United States, and the southern part and coastal part, and the principal topic of conversation, particularly among the distributors, is what this code is going to do for them. In all of my talks—I have usually made a city every day, and sometimes two—I have talked to many distributors in those cities up until night, if I didn't happen to be traveling. I have been out four weeks yesterday, and in all that trip I only found one man who didn't hope and really feel that this new deal is going to work out to his advantage. In fact, many said it can't be any worse anyway, and has to be better. There was quite a change in sentiment; the first two weeks I was out it was very noticeable. The last two weeks it wasn't so noticeable, because the grain and stock market kind of went off a little and sort of put a "damper" on it. However, there is a better sentiment, and if this "new deal" we hear so much about works out I look for a better marketing season. I don't think we are going to get any fancy prices for cranberries. I don't think we can get them even if we have a very short crop. The last two years has produced a bunch of bargain hunters. Regardless of what cities you go to, if you were in the shopping district at all, you find the women doing their own shopping—buying their own groceries and fruit, and you know that by doing so they are going to study prices. In one large city I spent two half days riding around to retail markets at different times of the day to see what time women shop, to see what kind of advertising we might do, and it was surprising to see so many women doing their own shopping. They didn't do that a few years ago. They have learned to look for bargains. If everything else advances proportionately, you can see cranberries will not be at the bottom of the list—probably at the top. Of course, at this time of the year I didn't see cranberries on the market, but I did see some in cold storage. The sentiment of the trade is probably as favorable toward cranberries as any other commodity, because the season of 1932 on an average showed cranberries, I be-

lieve, as one of the only commodities that didn't show red ink to the dealers. It might have to some of the retailers, because in many instances cranberries retailed at what we were getting for them. It is my impression that if things keep on as they are going, and we don't have a complete crop failure, we might look for a reasonably good season, with a crop that may possibly be slightly larger than last year's crop. I would like to have two or three years of last year's quality, as I said in the January meeting. I don't believe we ever had better all around quality in all three states than we had last year.

CROSS POLLINATING THE CRANBERRY

HENRY F. BAIN

Among the early studies on cranberry false blossom, extensive surveys were made to find whether all varieties were equally susceptible to the disease. It soon became evident that the McFarlin was rarely if ever infected badly enough to interfere with production, while the Early Black usually showed greater freedom from infection than most other varieties. Following these observations there was a period when we hoped it might be possible to discover, among wild vines that had grown in competition with the disease for an unknown length of time in the past, some vine that would prove to be wholly immune. A considerable number of single vine selections have been made in Wisconsin and elsewhere with this purpose in view. The results so far have been discouraging.

R. B. Wilcox has shown,¹ that the apparent resistance of the McFarlin and Early Black varieties is due to the feeding preferences of the leafhopper which carries the disease. His experiments suggested that the McFarlin would contract false blossom if infective hoppers were compelled to feed on it. That this is the case has been definitely proven by inoculating single McFarlin uprights in August, after the fruit was advanced far enough to be certain of the identity of the particular vines used.² Such inoculations, made at the time fruit bud formation was beginning, produced typical false blossom symptoms in the flowers the following spring. Nevertheless the fact remains that under ordinary growing conditions the McFarlin shows decided, often striking resistance to false blossom. The same degree of field resistance would be a very valuable quality in any variety. Hoping that the factors which make the McFarlin and Early Black distasteful to the leafhopper might prove to be inheritable, we have been trying for several years to cross them with other desirable varieties. This present paper describes the methods used both in crossing the flowers and growing the seeds, and includes a number of incidental observations on blooming, pollination, etc., which may be of interest.

As the flower-bud stalks (*or pedicels*) first begin to lengthen and carry the buds away from the upright in the spring, the buds are held erect; but before the blossoming stage is reached the pedicels bend over so that the buds are finally brought into an inverted position, and the flowers and berries henceforth remain pendant. This is, of course,

¹ Wilcox, R. B. Feeding preferences of the blunt-nosed leafhopper. (American Cranberry Growers' Association, Jan. 31, 1931.)

² Goldsworthy, V. C. A preliminary report on cranberry false blossom in Wisconsin, with special references to early literature as found in the Wisconsin Growers' Reports. Wisconsin State Cranberry Growers' Association, 46th Annual Report, Jan., 1933.

familiar to all of you, but is emphasized here because the position assumed by the flower has a direct and important bearing on pollination.

Let us examine into the structure of a bud just before it is ready to open. Above is the somewhat spherical green portion called the *ovary*, which will later develop into the berry, and below this the long, narrow petals inclose and protect two very important groups of organs. Sections cut through the ovary show that it is divided into four compartments or cells, and that in each cell, projecting from the thickened middle portion where the cell partitions unite, are the several structures called *ovules* which will later become seed.

The petals and organs inclosed by them are seen to be inserted on the flattened disk-like bottom of the ovary. In the center of this portion of the bud is the long narrow cylindrical *style*, growing out of the ovary at the upper end, while at the lower it ends just short of the surrounding *anther tubes*. The style is an absolutely essential organ, as it serves to catch pollen at its free end (called the stigma), and through it the pollen tubes gain entry to the ovary to effect fertilization. Injury to the style before fertilization takes place effectually prevents the setting of the berry.

Closely surrounding the style throughout its entire length are the eight *stamens*, the only parts of the flower visible below the petals after the blossom opens. The important parts of each stamen are the two pollen sacs near the base, in which pollen is produced, and the two long narrow tubes leading from the sacs, each with a circular pore at the end, through which pollen is subsequently discharged. There is thus a circle of 16 minute openings surrounding the stigma but placed slightly below it, through which pollen escapes to become available for pollinating purposes. With sufficient care the stamens may be removed from a bud without impairing its capacity to be pollinated and set fruit.

Cranberry pollen is compound, each unit consisting of 4 united grains. Even so, the united grains are too minute to be seen individually with the naked eye, measuring only about 1/750th of an inch in diameter when dry. In mass the pollen resembles a very fine yellow dust. Cranberry pollen grains are large compared with those of many other plants, and because of their size and shape are decidedly not adapted to wind dispersal.

Pollination consists of transferring pollen from the anthers to receptive stigmas. Dr. Franklin¹ has long since demonstrated that insects rather than wind are the principal means of pollination in the cranberry. The more closely one observes this plant the more forcefully is he impressed with the fact. The type of pollen grain produced is not the only structural modification favoring insect pollination. It has been mentioned that in the mature bud the anther-tubes exceed the style in length. These relative positions are maintained for two or sometimes three days after the blossom opens. Pollen is ready to be discharged almost immediately after the flower opens, shaking down readily upon the slightest jarring, and the plane of release is located below the included stigma. On the second or third day after opening the style elongates, growing out until it projects a short distance beyond the anther-tubes. Then a small drop of a sticky fluid is exuded upon the stigma and the flower now for the first time becomes receptive to pollen. The stigmatic surface is confined to the inside of the cone-shaped depression in the end of the style, and since the latter is suspended vertically it would seem that extraordinary precau-

¹ Franklin, H. J. & Morse, F. W. Blossom pollination. In Reports on Experimental work in connection with cranberries. Massachusetts Agricultural Experiment Station, Bulletin 150:48 1914. See also earlier Annual Reports in this series.

tions have been taken to guard against rather than to favor wind pollination. The delayed maturing of the stigma is clearly intended to prevent close-pollination. The flower is not sterile to its own pollen in any of the varieties we have tested, however.

After the pollen grains lodge in the sticky fluid on the stigma they germinate and send thread-like outgrowths known as *pollen tubes* up through passageways in the style, into the ovary cavity, and finally into contact with individual ovules. A certain part of the contents of the pollen grains passes up these tubes, penetrates the ovules, and unites with definite structures in the ovules to complete *fertilization* and initiate seed and berry development. Fertilization is completed in from two to three days after the flower is pollinated.

The natural process of pollination in the cranberry is for insects to become dusted with pollen as they climb over the flowers seeking the nectar secreted about the base of the stamens, and to rub pollen on the sticky receptive stigmas of other flowers. Evidently it requires at least two visits to each flower to effect pollination, as insects are attracted when the flower first opens and stigmas are not receptive at that time.

In making crosses between two varieties, stamens are removed from the buds of one, after which the buds are shielded from insects and wind until the stigmas are receptive. Pollen from the other variety is then applied and the flowers kept enclosed for at least three days more. The seeds resulting from the crosses of course, must be grown to obtain plants of the mixed parentage.

In practice, a day or two before the most advanced bud is ready to open, the stamens are removed with a dissecting needle having a very short hook at the end. Usually only one or two buds on an upright are used. One up to as many as four uprights are then inclosed in an inverted 200 c. c. Ehrlenmeyer flask. The open end of the flask is fitted with a cork stopper cut in the following manner. A 7/16th-inch hole is bored near the center and a 3/16th-inch hole near one edge. The small end of the cork is now trimmed so as to taper from a rim about the center hole to the circle where the cork comes in contact with the glass. The smaller hole thus opens near the bottom of the cone-shaped part of the cork inside the flask, and serves to carry off water of transpiration. It is filled with cotton to exclude insects. The cork is now cut in half lengthwise through the large hole. When set up the two halves are fastened together with shellac about the bases of the uprights, sufficient cotton first being wrapped around the stems to prevent entry of insects. When carefully set up the cotton in the center remains perfectly dry, all moisture draining off through the smaller hole. The flasks may be quickly and easily removed for pollinating. They are supported in an inverted position by wire rings fastened to stakes.

Five and one-half inch battery jars set directly in the sand have also been tried and work satisfactorily if partially shaded and the weather happens not to be too hot. There is more chance of accidental pollination because the flowers are exposed a greater length of time while being pollinated. However, there has been no setting of berries in jars that have been left unpollinated as a check on the method.

One might naturally think it would be too hot for the plants to survive shut up in the glass flask and exposed to the full sun. Occasionally there is burning or failure to set fruit, but mostly when the outside temperature goes above 95 degrees or more. The large amount of water of transpiration which condenses over the glass surfaces undoubtedly helps keep them cool. One very curious effect has been noticed on several occasions in both the jars and the flasks, when the temperature was evidently almost but not quite high enough to injure the blossoms. The pedicels in these cases have straightened up and

held the flowers erect in a manner strongly suggestive of false blossom. The berries remain upright a long time after the jars are removed.

Pollen of the desired variety is collected in the gelatin capsules commonly used by druggists. It is shaken out by rapidly rolling the flower back and forth between thumb and forefinger, and as it falls it is attracted to the sides of the capsule and adheres in a thin yellowish layer. It is supplied to the stigmas simply by rubbing the tips of the styles down the side of the capsule. In the routine crosses the flowers are pollinated on the 4th or 5th day and again on the 8th day after stamens are removed. It takes a number of flowers to furnish the necessary amount of pollen, and we soon found that this introduced a source of error, because of the badly mixed condition existing in most varieties of cranberries. We have had to grow many of the varieties at the nursery, where we could rogue out vines not true to type.

In the effort to save as many berries as possible from the crosses, we have come to realize as never before how great the loss of fruit in the field is. We regularly lose from $\frac{1}{4}$ to $\frac{1}{2}$ of the berries which set, largely because of insects, despite efforts to protect them by covering with wire cages and by other means.

The flowers pollinated artificially are as a rule supplied with an excess of pollen. The numbers of seeds per berry have been recorded to see whether different pollens affect the numbers to any extent. Some typical results are as follows:

Varieties crossed	No. Berries from the cross	Average No. of seed per berry	Maximum No. of seed per berry
McFarlin with Bennett pollen.....	59	27	39
McFarlin with Centennial pollen....	12	27	35
McFarlin with Early Black pollen....	80	25	43
McFarlin with Howes pollen.....	42	25	37
McFarlin with Mammoth pollen.....	61	24	41
McFarlin with Prolific pollen.....	52	29	45
McFarlin with Searls pollen.....	60	31	43
McFarlin Close pollinated.....	10	14	28
Early Black with Howes pollen.....	38	30	39
Early Black with McFarlin pollen....	67	26	43
Early Black Close pollinated.....	16	16	27
Howes with Early Black pollen.....	10	11	17
Howes with McFarlin pollen.....	22	13	23

It appears that both McFarlins and Blacks set fewer seed when pollen from the same flower is used on the stigma. It also appears that Howes will not produce many seed under the most favorable conditions. The other two varieties, as well as several not included in the above table, have all produced approximately equal average numbers and maximum numbers of seed.

Cranberry seed will not normally germinate as soon as the berries ripen, though it has been reported that germination can be stimulated by certain chemical treatments.¹ In one test we planted 100 seed freshly removed from berries every week beginning the middle of October. A few seed of the lot planted Dec. 16 were the first to germinate. Early in January all good seed germinated. It generally takes 3 weeks or slightly more for the seed to come through the soil.

The seeds are planted in flats of peat in the greenhouse some time in January or February. The germinating seeds and young plants

¹ Rayner, M. C. The biology of fungus infection in the genus *Vaccinium*. Ann. Bot. 43:55—70—1929.

are so susceptible to damping-off fungi that to date we have never succeeded in saving more than 15 or 20% of the seed planted. An artificial soil² tried late the past spring gives promise of overcoming this handicap. It is composed of equal parts of sand and ground cork, and unlike peat may be sterilized with steam under pressure without becoming toxic to plants. Nutrient solutions must, of course, be used with the mixture.

The plants grow slowly. After 8 or 10 weeks, when they are from an inch to an inch and a half in height and have 8 or 10 true leaves, they are transferred from the flats to pots. The first shoot grows erect, finally reaching a height of four or five inches, is very slender and has small leaves. Some time during the summer one or more runners branch out from near the base and in some cases reach a length of 18 inches or more before growth is arrested in the fall. The leaves on the runners more nearly approximate normal size.

The plants require a resting period after the summer's growth. One lot of seedlings planted in January and kept in Washington for experimental purposes stopped growing early in October. Near the end of November all but 5 of the pots were set outside the greenhouse. After 6 weeks, during which time there had been only a few days of freezing weather, one plant was returned to the greenhouse. It remained dormant for about three weeks, finally put out a half inch of weak growth and then became dormant again. This process was repeated two or three times, but at the end of May it appeared to have resumed normal growth. Meanwhile a second pot was brought in after eight weeks' exposure. It started vigorous growth immediately and was still growing rapidly the last of May. The plants which were kept in the greenhouse all winter did not turn the normal red winter color. They were just beginning to grow when last seen late in May.

Seedlings would probably bear fruit the third summer if given optimum conditions for growth. So far none of our crosses have bloomed, as it has been necessary to move the older plants several times. At present we have more than 1500 seedlings started.

CURRENT INSECT PROBLEMS AND NEW INSECTICIDES

E. L. CHAMBERS

What I have to say this afternoon would probably not come under the category of a speech but just as a few remarks covering some of the highlights of the insect pest situation for the season. In discussing this subject over the radio the other day, I was advised by one of the growers here this afternoon that I failed to mention any of the cranberry pests. I was pleasantly surprised to find that someone outside of members of my own family did actually listen in to these noon-day farm programs over radio station WHA. I knew you cranberry growers were having your troubles growing your crop all right but did not want to add to your problem by suggesting that there might be a lot of wormy cranberries. I was afraid that if I started giving statistics from losses of fruit worm and fire worm that the consumers might lose their appetite for cranberry sauce.

The insect obtaining the most publicity over the state and doubt-

² McArdle, R. E. Relation of mycorrhizae to coniferous seedlings. Journal Agricultural Research 44:287-317. 1932.

lessly the one responsible for the most damage to our crops here in Wisconsin this summer, was the grasshopper. While grasshopper injury occurs annually in several counties in the northern part of the state, we never have had the losses and widespread distribution that we experienced last summer. More than thirty-three counties have required some aid from the state during the past two months. The situation became so acute that the Legislature appropriated \$10,000 to buy poison for the control of grasshoppers and army worms. This sum of money naturally did not go very far having to be spread over so much territory and several thousand dollars additional funds had to be allotted by the Governor from other projects of the Department. Distributing this money in counties where it did not amount to a drop in the bucket was about as pleasant a task as attempting to divide up several lolly-pops between a schoolroom of children. Those who got no lolly-pops did not like you and those who got one thought they should have a different colored one like someone else got. In grasshopper control each county agent felt that his county was an exception and that most of the appropriation should be spent in his county. The money, we believe, was allotted fairly since it was divided on the basis of a grasshopper population determined by an accurate survey. One county, Langlade for instance, spent nearly twelve thousand dollars of its own funds and received less than two thousand dollars from the state funds. The poison was mixed and distributed under the direction of the Department of Agriculture and Markets and in every case where the material was used as directed, satisfactory results were secured and no injuries resulted. Every bag of poison carried a warning that the sack should be burned after being emptied and despite all our warnings through the press and during the distribution, some of the farmers became careless, thinking that the poison would not injure the livestock and allowed them to have access to it, resulting in their death. A few reports of this kind soon emphasized the danger of this practice and prevented further losses.

Army worm outbreaks occurred in the vicinity of Appleton, Green Bay, Camp Douglas and Sheboygan and these also were brought under control by poisoning with this same white arsenic, bran and molasses, provided by the special state appropriation. As far as other major pests are concerned, we can only say that it being a hot, dry season following a mild winter, conditions seemed ideal for all of our more serious pests. The potato beetle was worse than it has been for years, the cucumber beetle, corn ear worm, cut worms, codling moths, canker worms as well as scale insects and plant lice, all seemed to take advantage last year of the growers who were compelled to retrench financially and could do little in the way of control. More than one hundred carloads of poison bran grasshopper bait was needed to check the grasshoppers. Despite the speeding up of legislation, purchase, and delivery of the poison, it was nearly the first of July before the most of the material was distributed. A little attention earlier could have reduced these losses to a minimum by killing the grasshoppers in their egg beds at much less expense of time and materials, but like most insect problems, it is difficult to convince the public until the damage is done.

I have brought along with me today some specimens of three plants used for making two new insecticides now becoming popular on the market to replace arsenical sprays wherever possible. With so much agitation on the subject of spray residues, the public is being frightened into believing that they are almost taking their lives in their own hands by eating sprayed fruit. As a matter of fact, there are other avenues of poison that are more dangerous than this one, yet the propaganda directed against fruit has been very disastrous and probably will necessitate the finding of something else as a substitute for

arsenical sprays if the government chemists continue their propaganda. You are all familiar with nicotine sulphur or Black leaf-40, manufactured from the tobacco plant. The cost of this material is very high as compared with arsenical sprays and the like because to make a 0.05 per cent solution the standard mixture requires as much as twenty-five pounds of certain varieties of tobacco leaves. Pyrethrum, as you know, has been used as an insecticide for many years and I have here in my hand a bottle containing the dried heads of a species of chrysanthemum from which the highly volatile oil is extracted. Like nicotine sulphate, it is too expensive on a large scale. This particular species *Chrysanthemum (cinerariae folium)* like most of this material used for pyrethrum manufacture, was imported from Japan. As much as one million five hundred thousands pounds of this material has been imported into this country in a single year. It kills insects by paralyzing the nervous system, but loses its strength upon exposure to the air. It is considered harmless to warm-blooded animals and to human beings.

Recently you have been reading quite a little about Rotenone. It is a volatile substance extracted from the roots of certain tropical plants, primarily Derris and Cube. Rotenone is toxic to both chewing and sucking insects, especially aphids and is considered non-toxic to plants as well as man and animals. Derris from which this insecticide is extracted is a climbing shrub growing throughout the tropics mainly in the Malay Peninsula and East Indies. It is called by the natives "tuba root." This bundle of roots which I am about to pass out to you, are Derris roots imported from the Island of Java. The root is very poisonous to fish when a small piece is thrown into the water. It is said to paralyze fish almost instantly. (You will note I did not say how big the piece had to be.)

You have, no doubt, read recently in your newspaper of a plant which grows here in Wisconsin reported to contain this same Rotenone in its roots. This plant, which has had considerable notoriety throughout the newspapers, is the plant I hold in my hand and is known by several common names including "Devil's Shoestring" and Wild Pea. It is known botanically as (*Cracca Virginiana*). It grows very extensively in light sandy soils in this state. Government chemists claim that it has more Rotenone in its roots than some of the Derris roots have, so it may prove a very valuable weed. If it makes Rotenone spraying material at a reasonable cost, it will revolutionize the spraying industry and we believe will solve the spray residue problem. The main objection against Rotenone, when used as a stomach poison, is that it readily decomposes when exposed to the sunlight and loses its toxic qualities in a few days. This would necessitate frequent repetition of spraying and would make it too costly for orchard application at its present price. These contact sprays can not be analyzed by chemical tests but, like pyrethrum, must be tested on the insects or tried out on the dog, so to speak. It must be compared against known materials in what is known as a death chamber, which in reality is a large fumigating box about eight feet each way in which one hundred or so flies are used to test out a given amount of the material over a definite period with the tests being repeated several days in succession.

REMARKS ON CRANBERRY CULTURE

L. M. ROGERS

Perhaps you would be interested to know that while there has been no construction of cranberry marsh on a large scale this year quite a number of growers have put in small areas of new marsh, and several parties have started new locations in a small way. Altogether 50 acres of new marsh have been planted. There has also been some re-modelling of old fields.

Varieties of vines used were as follows: 7A. Native, 7A. Howes, 15A. Searles, and 26A. McFarlin. Growers have sanded about 275A. this season.

A careful check has been made of the acreage of cranberries which should be used for statistical purposes for Wisconsin at the present time. The acreage was listed as 2120 in 1928. Making corrections for changes since 1928 both for new plantings and abandoned areas (those outside water protection) we find that there are not now more than 2000 acres of vines in the state, including the 1933 plantings. Some of this area is in poor condition but is being rapidly reclaimed by the aid of the electric clipper, hand weeding, sanding, and the use of various weed-killers.

The budding last fall was light and winter took a heavy toll so we may not expect a large crop. Considerable damage was done last year by the root girdler and there may be further work this summer. This pest is easily controlled by fall flooding and should be a menace only where there is no water available in September. Girdler work is common and widespread in the central and southern districts even where no vines have been killed as yet. Wherever it can be done in these locations, growers should flood after harvest. A 48 hour full flood should be long enough before September 15. The same result should be obtained by holding the water over the surface two or three weeks to extend into October.

As usual some damage has been done by the black-head fireworm and slight incidental injury by flooding for control. As was the case last spring, June flooding became dangerous because of the very warm days and nights from the middle of May on through the flooding season. The fire-worm will live almost as long under water as will the hocks and the grower who has to flood must know to a nicety how long his vines can remain under water without injury. Many growers have taken twelve hours complete flood at about June 5 to June 10 as a base to work from. The time of safety is determined by several influences such as the advancement of growth, the water temperatures, the kind of water and the kind of weather. Growers who cannot get the water on and off quickly should not attempt June floodings, but should make a longer flood earlier. When fireworms are very numerous I do not think they can be controlled by May flooding except in seasons of very early hatching. Under these conditions it would be well to water-cure. A good method to use would be to let off the winter flood as usual, reflood about May 25, and let off the water June 25 to June 30, reflood again in 15 to 18 days for 30 hours to catch worms that may not have hatched under the flood. With good weather conditions there should not be any killing of new growth by the latter flood.

Those using the June flood and having high spots that do not readily cover for the desired time should either scalp them down to the general level and replant or mow or burn over the area. By the latter methods there should be little or no crop loss as larger yields may be expected for several years, following the first year's loss. The

same usually holds good after the water-cure. If each grower will take careful notes of water temperatures and the state of the weather, after a few trials he should learn to time his flooding so as to sustain no hook injury. Apparently the best time to flood is to have the twelve hours all in daylight. Vines do not supply oxygen to themselves in darkness under water and not as much in dark colored water as in water that is clear.

Further testing of fuel oil as a weed killer has demonstrated that some of the most feared weeds can be controlled by its use. It is not yet quite clear whether the No. 1 or the No. 3 oil is best. My tests favor the No. 3, but some growers think the No. 1 is better. We have much more to learn about the oils and their application, but one thing seems certain: The soil must be dry when oil is applied. Rain soon after or flooding 24 hours after application, apparently does not influence results.

Growers using the stamping method of setting vines on peat are now getting splendid results, by using plenty of good vines carefully distributed and carefully stamped in. The method of cutting vines into very short lengths and puddling in with a fork usually gives a good catch, but water must be held very high for a long period and the plants seem to make a short spindling growth the first year. The past three years have shown some very excellent fields planted by the dibble method and by the single blade stamper through sand. If the dibble is used, great care should be taken that the plants do not heave by frost. Heaving breaks the roots and retards the next year's growth. There seems to be little choice between the dibble and the single blade stamp when planting through sand. In planting through sand with the dibble, the best looking fields have been planted in squares 6 x 6 inches. I would suggest that someone try planting 5 x 8 inches. This will take a few less vines and will give some space for the inducement of runners and also some space to walk in for the first year's weeding. A small area planted 5 x 8 in our nursery gave excellent results in vine growth.

I am pleased that so many growers who have remade marsh or made new in the past few years, have made level beds getting out all bad grass roots before planting, and have selected vigorous vines getting them in early. Money spent for these things is money spent to good advantage. It is better to construct well, even if less acreage must be built.

Because of the severe injury to vines in many marshes, by the almost unprecedented cold of late Nov. and of Dec. last season, there will undoubtedly be a reaction toward earlier flooding this fall. I hope growers will not go back to the old method of early and deep winter flooding.

CRANBERRY PROBLEMS OF 1933

VERNON C. GOLDSWORTHY

Due to the last two or three very dry years, insects in Wisconsin cranberry marshes have increased very rapidly. Take the leaf hoppers (*Euscelis striatulus*, *Euscelis vaccinii*) for example, the only known carriers of the cranberry false blossom virus. My records (I now have a complete record of the leaf hopper population on every cranberry bog in the state) show that since 1931 the leaf hopper population on some marshes has increased many times. This means that most likely the false blossom is going to spread very rapidly on those

marshes within the next two or three years. False blossom is an insidious thing and its spread in the beginning is very hard to detect because of the fact that this year's infection will not show up until next year, and in many cases if the upright infected is not an upright with a fruit bud, the disease may not show up until two or three years later. All during this period, however, it may be a very virulent source of a great deal of additional infection. By the time the grower has noted its increase and the damage done, it is often too late to materially aid an infected section and it is merely a question of time as to how soon the infected vines will die, and they do die. A false blossom vine never recovers and becomes a normal plant.

As to the rapidity of spread of false blossom, it depends absolutely on the number of hoppers capable of carrying the virus, and if plentiful they may infect a section that contains a few diseased vines as much as 90 to 100% in three or four years. The number of hoppers and diseased vines, incidentally, go hand in hand.

The leaf-hoppers (*Euscelis striatulus* and *E. vaccinii*) are single hooded species. The adult hoppers begin to appear about the Fourth of July in Wisconsin, and are found abundantly until the early part of September, when their numbers rapidly decrease. The nymphs appear towards the end of May, are abundant all of June and the first part of July. Any control method for the hopper should be directed at the hoppers when they are in the nymph stage and at a time when all are hatched. Preliminary life studies of the leaf-hoppers (*E. striatulus*, *E. vaccinii*) show this period to be from the end of June until the first part of July in Wisconsin.

There are two main methods of control of the leaf hoppers, flooding and spraying. In spraying, a pyrethrum spray has been found very effective. The spray is used as recommended by the manufacturers of the various brands, and in addition, one gallon of liquid soap was used to each one hundred gallons of spray for a spreader. The spray is put on with a force of 250 pounds to 300 pounds, and is applied at the rate of 300 gallons per acre in medium heavy vines. Heavier vines will naturally require more spray material. This year at Biron 20 acres were sprayed with excellent results, obtaining a 95% kill. No spray will be very apt to get a 100% kill and a 95% kill is very good. Spraying, to be effective, must be carried on from year to year to take care of the hoppers that have been missed and the additional hoppers which have come in from the outside. Right here I wish to state that the leaf-hoppers (*E. striatulus*, *E. vaccinii*) are found abundantly on brown lush (*Chamaedaphne calyculata*) moss berry and wild cranberry. When the hoppers come in on a cultivated marsh they find conditions ideal and hence multiply very rapidly. This is especially noticeable on some of the newer marshes in the state which I have been checking very closely.

The other method of control is by flooding, and is very effective if properly carried out. Flooding may be done for the leaf-hopper on sections with heavy hooks about June 10th to June 15th, in ordinary years, depending on the conditions of the vines. At this time the bulk of the hoppers are doubtlessly hatched, but not all will be hatched, and some hoppers will undoubtedly be hatching while the plants are in full bloom, or possibly even later. A ten to twelve hour flood can usually be put on with comparative safety at this time, and all hoppers present should be readily killed. It is at this time a fire worm flood is usually put on, and any one flooding for fire worm at this time unquestionably gets many of the hoppers. In flooding for hoppers the length of time the water can be held depends on several factors. Perhaps one of the most important considerations is the condition of the hooks, and the farther the hooks are along the less water they will stand. Clearness of water is a vital essential. If water is

dirty or black, photosynthesis cannot take place, and in the process of photosynthesis oxygen is given off and may be added to the water, and does much to prevent injury to vines under submergence. Injury is usually due to a lack of oxygen in the water. Green plants, and green plants only, are able to take the carbon dioxide of the air and in the presence of sunlight and chlorophyll in the leaves, build this up into plant food and release the oxygen. Plant respiration requires oxygen the same as animal respiration and metabolism, and if there is a lack of oxygen both will suffer. Oxygen as a gas makes up about 20% of the air we breathe, while nitrogen makes up the bulk of the rest of the air. This oxygen gas in the air is not readily absorbed by water, and it is desirable to have plants add oxygen to the water if possible. Now if the water is dirty, the day cloudy, or flooding takes place at night, the plants cannot make oxygen to add to the water, and hence there is a much greater chance for injury to occur. Oxygen is only made by the plant during the day in the presence of sunlight. Rapidly growing parts of plants, as the hooks and growing tips, require more oxygen than other parts less active, and hence are the quickest to be injured. Depth of water is an important factor, as the deeper the water the less the sun's rays are able to enter due to absorption by minute material suspended in the water. Hence it is desirable to clip before flooding, and then just cover all vegetative growth on the flooded area. The temperature of the water is important in two ways, as it affects both the respiration rate of the plant and the oxygen holding capacity of the water. As the water temperature increases, respiration is speeded up and the plant requires more oxygen, at the same time the oxygen holding capacity of the water is decreased. All of you undoubtedly have seen a glass of water in a warm room that has been standing for a short time, and have noticed the bubbles on the side of the glass. Those bubbles you noticed are bubbles of air which have collected on the side of the glass and will pass off, because as the water in the glass becomes warmer it can not hold so much of the dissolved air as it could when the glass of water was colder. This law of physics is also illustrated in boiling water, for the first bubbles which come off are not bubbles of steam, but are bubbles of air which are forced to the surface by increased temperature. Hence it is essential to have water with as low a temperature as possible in flooding if one is to avoid injury. On the other hand, if the water is cold it generally requires a longer period in which to kill insects, and the conditions which cause plant injury also kill the insects quicker.

This year Mr. Jepson and his partners flooded their entire marsh June 28, 29, and 30, ten to twelve hours for leaf-hoppers, and obtained excellent control. The results were checked by sweeping. As the water was not high enough to cover all vegetative growth, each section was planked three or four times to be sure all the nymphs were forced into the water. Kerosene was added to the surface of the water at the rate of about two gallons for each acre flooded. The sides of the section were also sprayed with kerosene so as to pick up any hoppers that might have floated to shore. The water was held twelve hours and very little injury resulted. The marsh had no berries, hence the late day of flooding, but this is by no means advisable where a crop of berries is expected. On new plantings that have no fruit a flood for good control should be put on about the first of July, and a twelve to eighteen hour flood should give almost a 100% kill. Care must be used, however, to see that the new uprights are not injured, as some years this could happen very easily, depending on the condition of the water and vines. Conditions vary so much, and as there is *no known method* of knowing how long vines can stand submergence under the varying conditions, each grower *must* be his own judge. An after-blossom flood was tried at Biron this year, July 12. The

berries were quite large, and the water was held on twelve hours. A good kill resulted as shown by sweeping before and after flooding, and no injury resulted to the vines or fruit. I believe in the past that boat clipping twice during the summer has been very instrumental in keeping down the leaf-hoppers. On Guy Potter's marsh, for example, where he had been boat clipping for some time, very few hoppers are present. This is true as well of other marshes where boat clipping has been carried out.

This year at Cranberry Lake, fifteen acres were sprayed for the cranberry leaf miner (*Coptodisca negligence Braun*) last year's experimental work gave such excellent control that Mr. Hedler decided to spray considerable more acreage this year. The spray which was used was nicotine sulphate, at the rate of 1-500. A liquid soap spreader was used at the rate of 1 gallon per 100 gallons of spray. The spray was put on at the rate of 350 gallons per acre, and it is hoped that as good control may be obtained as last year, although weather conditions were not entirely favorable. No injury resulted from the spray, although it was necessary to spray in full bloom. The cranberry leaf miner is a very hard insect to control, and there are only one or two days in an entire year when it can be sprayed successfully. Those days are shortly after the adult emerges, and before they can lay eggs for next year's miners. Incidentally, spraying at this time is the only known method of control.

The girdler (*Crambus hortuellus*) last year worked widely over the cranberry growing region of Wisconsin, but it did very little damage in the northern marshes. Control of this pest will have to be carried out this year. About the 15th of August a flood should be put on for at least two days, and longer if possible. The water should be put in among the vines and up an inch or two so that all of the bog floor is covered with at least an inch of water and not enough so that the berries will be damaged. On sections which are not level perhaps it would be best to raise the water at night and lower it in the morning, so that vines with fruit on them would not be in the water all day and perhaps scald. Then again the following night the water should be raised, and this should finish the weakened worms which remain. To my knowledge this method of control has never been tried, but I feel it should work and will be glad to check any marsh for any grower if they try this method. In some cases if water is very short, it may be best to pick early, say the end of August, and then flood for a week or ten days. Sections severely girdled should be sanded this winter to enable them to gain a new foothold.

In regard to the injury in the Mather district, I believe it to be due to a combination of factors. Girdling has been an important factor in many cases, and girdled vines were weakened vines and hence more easily killed by last fall and winter's very unusual cold weather. In some cases the girdler work alone has been sufficient to kill the vines, but not in all cases. The last two or three dry years have weakened the vines very materially, and made them more susceptible to injury. Old weak vines, vines which produced heavily, and false blossom vines that lacked vigor also were the first to suffer, as would naturally be expected. This condition shows up particularly well at the Palmetter marsh in Mather. Other cases of injury are clearly due to heaving, as the vines where I found by careful examination actually broken off by a mechanical force. As ice on expanding exerts a pressure of 20,000 pounds per square inch it would be a very simple matter to have vine imbedded in water soaked soil on freezing say a couple of inches, to heave up and break the vines. In other cases, vines were injured by freezing conditions before the water was put on in the fall, but not killed outright as on the Biron marsh, for example. That this is due to cold weather is clearly shown by progressive injury on the Phil

Bennett marsh. Here the water was scarce and two sections were flooded at a time, and then the next two were taken, and so on. The injury grew in severity the later the water was held off from the sections. The sections which were covered first were injured very little, while those flowed last were injured very badly. Another type of injury is the direct winter killing, and is commonly experienced. In this case the vines turn red, but generally send forth new growth the following spring. Very likely the conditions which caused this year's trouble will not appear again next year, or maybe for a series of years, but no doubt they will return sometime. If it gets cold, and hard freezing temperatures are noted, even if early in the season, the grower should by all means flood and protect his vines. A winter flood should be put on according to temperature and not according to any specific date and should vary from year to year with natural climatic conditions. It is difficult to tell at the present time just exactly what may have happened last fall and winter as there are no careful records of conditions at that time and the above discussion is what I believe may have occurred. Undoubtedly, new factors bearing on the case will be discovered and we may be forced to take a new stand on the question, but at the present the above seems most logical.

Trichogamma parasites were tried again this year. Last year results were very encouraging. The first batch of parasites were not put out quite early enough due to the fact that they arrived late, and the fruit worm (*Mineola vaccinii*) was earlier this year than usual. However, the parasites should be effective on eggs which were laid later.

In conclusion I wish to say that I hope the State will find it possible to continue the cranberry appropriations. The cranberry crop is a very special one and requires special training in that particular field. The average farmer can turn to the State University for help or to his county agent. Not so the cranberry grower, however, and if he wants aid in his troubles at the present time, and he is constantly being faced with new problems, he must depend on the field man, under the Department of Agriculture and Markets of the State. The Wisconsin cranberry grower cannot look to eastern growers for guidance for our climatic conditions are widely divorced from theirs. We have insects that they do not have, and the insects which we do have in common vary in their life cycle so that control conditions must be applied at different times. The average cranberry grower has neither the laboratory facilities nor the special training required to do much of the experimental work that is required of a field man, such as the life history studies of insects. Neither has he time to study over 125 species of leaf-hoppers found on Wisconsin marshes, so as to be able to determine the *Euscelis* species. This job alone really requires a specialist. The inspection of vines offered for sale is a very important part of the field man's activity and the success of many young plantings depends absolutely on knowing where to get vines that are reasonably free from false blossom. So does the fact of knowing how to flood properly, or spray for the carriers of cranberry false blossom in sections where the disease is just gaining a foothold. At the present time, much experimental work is being done and if the work was dropped would mean a much greater loss than mere momentary value of keeping up the work for the time being.

ADDRESS

WALTER EBLING, *State Statistician*

I think I have the distinction of being about the only person who has been in this assembly for the first time. I have talked to a number of you growers, and I have been impressed with the age of your organization. I just met Mr. Treat, and he tells me it is just forty-six years ago that he attended the first meeting of this organization.

To those of you who are not acquainted with the work of a statistician, I wish to say that a statistician is one who has the responsibility of estimating various crops and livestock production. I have given very little time to cranberries. We have 182,000 farmers in this country, and the number of those engaged in the cranberry industry is exceedingly small. The dairy industry probably reaches 165,000 farms, whereas the cranberry industry reaches I don't know how many, but the number is limited. We are taking more interest lately, because there has been more effort to cover the agricultural field completely.

The matter of collecting agricultural statistics is the oldest government enterprise in agriculture. In 1839, long before we have any other type of agricultural enterprise, we have had this sort of work.

I am therefore particularly happy to have an opportunity to meet with you today, and to meet so many of you growers. I am also particularly happy to meet your group, because I have long known about it. You have a very interesting and specialized industry. As time goes on, I hope to become acquainted with many more of your members. I have asked your secretary to give me a list of the names of your producers. We may want to get information from you, and I am sure you will be glad to give us a few facts when we ask for them. I am happy to be with you, and hope I can meet with you again. Our crop reports come the first week in the month, and dairy reports right after that. Mr. Chambers was coming today, and I sandwiched this meeting in between the two.

COMPENSATION INSURANCE

A. B. SCOTT

This question of workingmen's compensation and insurance rates is a "hang-over" from last year. I don't know of how much interest it will be, but I will sketch it briefly. Last summer, after an increase of approximately 20 per cent in compensation insurance rates, I took the matter up with the Commissioner of Insurance, asking if it would be possible to have some rate adjustment made or some action taken to prevent the increase in rates. I will read his reply to my letter:

"The writer has discussed the contents of your letter of June 27 with the rating committee of the Wisconsin Compensation Rating and Inspection Bureau. We note your statement that the rates applicable to cranberry operations have increased almost 28% in the past year.

"For your better information, we can advise that the rates upon all classifications have been uniformly increased approximately 25% since May 1, 1931. The increase was made necessary by the following events:

"1. The last session of the legislature increased the benefits payable under the compensation law by approximately 5% and made certain

other changes, all of which tended to increase the cost of claims under the compensation law to a substantial extent.

"2. The gradual decrease in wage levels occurring during the past 18 months has resulted in about a 33 $\frac{1}{3}$ % increase in exposure per \$100 of payroll throughout the state of Wisconsin. In other words, the rates during the first part of 1931 were based upon \$100 of payroll at the wage rate which prevailed in 1929, and it follows that when wage rates decrease, there is a corresponding increase in the exposure to hazard since \$100 of payroll now represents from one-third to one-half more hours of labor.

"3. Since jobs have become scarce and unemployment is prevalent to a large extent in all industries, men who have been injured prefer to prolong their injuries and remain at home drawing 70% of their wage from the insurance company rather than return to work with the uncertainty of losing their job at any time. Consequently, the increase in malingering has been tremendous.

"These three factors together with other less important considerations compelled the insurance companies to request a very large increase in rates, and after a careful review of all the facts this board permitted increases which totalled about 25%. The increase applied to your industry has been the same as that applied to all others and we can assure you there has been no discrimination in that regard.

"The experience in your classification indicates that there will be no further increase in the pure premium during the next year."

We still maintain that the rates are too high as compared to the losses suffered by cranberry growers. I wrote another letter to Mr. Mount on the 27th, and I presented the same claim. His answer is as follows:

"If you are of the opinion that the industry of cranberry growing should be made the subject of a separate classification, we suggest that you address a communication containing the facts to the Wisconsin Compensation Rating and Inspection Bureau, located at 312 East Wisconsin Avenue, Milwaukee, Wisconsin. The Rating Committee of this bureau will meet on December 13, and all such matters are referred to that committee for action.

"It is possible for cranberry growers as a class to organize their own compensation insurance company, either upon the stock or mutual plan. In this connection, we have requested the Insurance Department to write you.

"The Workmen's Compensation Act of Wisconsin is compulsory and any employer who usually employs three or more persons must make provision for meeting his liability under that act, either by insurance in a compensation insurance company or by carrying the risk himself with the approval of the Industrial Commission.

"Upon the subject of the present rates applicable to your industry, we refer you to our letter dated July 16, 1932 addressed to you as President of the Wisconsin State Cranberry Growers Association."

In a conversation with Mr. Lawton, secretary of the Workmen's Compensation Board, he stated at least 200 premiums would have to be paid in, before a mutual could be organized to work under a charter. I then wrote a letter to the Wisconsin Rating and Inspection Bureau, asking them why we couldn't get a separate rating, and what the possibilities would be. His answer reads as follows:

"Answering yours of December 12, it occurs to us that assigning the market and truck gardening classification to the work of harvesting and sorting cranberries is very fair and equitable. There would not appear to be any less hazard in connection with the harvesting and sorting of cranberries than there is in connection with the work of harvesting and sorting any other form of berry.

"The fact of whether or not the losses in connection with your industry have been excessive or light is merely an index and cannot

possibly be a determining factor, for the simple reason that work incident to harvesting and sorting cranberries would not develop sufficient experience in twenty-five years in the State of Wisconsin to furnish us with any defensible criteria. Before you could claim discrimination in the fixation of your rates, you would have to be able to prove discrimination insofar as similar operations are concerned, such as the harvesting, sorting, and packing of other berries.

"Naturally, all classifications of industry must necessarily be broad as an insurance principle, and must incorporate all risks falling within the various classifications, ranging from those with the least hazard to those with the most hazard. We are not prepared to make any definite statement, but, it would appear from your statement that possibly the harvesting, packing and sorting of cranberries would constitute a very good risk in comparison to other operations properly falling within the market and truck gardening classification."

Recently it came to my notice that there was an application from the insurance company for another increase in rates. If this increase takes effect, it will be a blanket increase of 21 per cent. I took that matter up with Mr. Mortensen at that time, as well as Mr. Lawton, and asked them to let us know when they had a public hearing in order that we may present our evidence in protesting such a rate, but they informed me that no such rate would be granted unless it could be made very clear that it was absolutely necessary.

While talking to Mr. Lawton, I inquired regarding rates for compensation insurance in other states and the plans under which it was handled. In the states of Washington and Ohio this class of insurance is handled entirely through an organization maintained by the state. The rate in Ohio is 16% lower than that in Wisconsin. New York and one or two other states, California is one I believe, have competing state organizations with the private corporations writing Workmen's Compensation Insurance. This tends to keep the rates from becoming too high.

Bringing the important points together for a review of the Workmen's Compensation Insurance question, we have:

1st. There apparently is no hope of getting a separate rate classification for cranberry growers due to the small amount of business that comes from their insurance premiums.

2nd. Any individual or corporation can elect to carry his own compensation insurance providing he can show the Industrial Commission that he is financially responsible to take care of any losses according to the loss rate tables in effect and will file with the commission a bond to that effect.

3rd. Organization of a mutual compensation insurance company requires that a minimum of 1500 employees be under its protection or that there will be a minimum of 200 premiums paid in annually to the mutual company.

4th. So far as our committee has gone into the matter, we are not prepared to advise the members of our association to consider the organization of a mutual company to take care of our compensation insurance. Before this is done, a considerable amount of data on rates and plans of operations of other mutuals should be gathered, also a possible working plan of such an organization should be made including the listing of all the possible hazards, a plan of financing and a statement of estimated savings such an organization would give over the present rates.

MINUTES OF THE 47TH ANNUAL MEETING

Meeting called to order at 2 P. M., Dec. 14, 1933, Realty Hall, Wisconsin Rapids.

President Herman Gebhardt gave the opening address. A resumé of the crop and market conditions of the year were given by Mr. A. U. Chaney. A paper on why insect control problems are on the increase was presented by Mr. E. L. Chambers. Mr. Vernon Goldsworthy spoke on insect pest and disease condition and control methods. An interesting account of the Wood county exhibit held at the state fair featuring cranberries was given by Co-Agent H. R. Lathrope, who had charge of it and won first place.

The minutes were read and approved. The financial report was read and audited by F. R. Barber and Vere Johnson, who reported the same correct. Motion was made and seconded to accept the committee's report.

Committees appointed to draft resolutions of regret on the passing of Mr. Henry Gebhardt were: S. N. Whittlesey, A. E. Bennett and O. O. Potter; to the Joe Wirtz family on the loss of their young son, Bernard; Roy Potter and Guy Nash.

Motion was made and seconded to allow the Brazeau bill of \$62.75.

Motion was made and seconded to appoint a committee, with the secretary as chairman to work out some solution of our financial difficulties. A. E. Bennett and Guy Nash were appointed.

Motion was made and seconded to renew subscriptions to Horticulture for all paid-up members.

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

Meeting adjourned.

Eighty-seven growers and friends attended the annual 6:30 banquet held at the Hotel Witter, following the meeting. Mr. Guy Babcock acted as toastmaster. Through the generosity of L. P. Daniels a fine program of instrumental and vocal selections and reading was enjoyed followed by dancing to the strains of the Getsinger-Favell orchestra. Mr. Daniels also presented Mr. A. U. Chaney with a large, beautifully decorated cake, a token of the esteem in which he is held.

CLARE S. SMITH,
Secretary.

ADDRESS

President, HERMAN J. GEBHARDT

The 1933 cranberry season is now rapidly drawing to a close. We have had to contend with another year of unusual drought—the fourth in succession. About this time last year there was a severe cold spell of short duration. Many who had water for winter protection had not used it; others had none. The winter was comparatively bare of snow and in consequence of these conditions most of the bogs of the state suffered more or less winter-killing. However, the month of May was quite free from frosts, and June the hottest on record, and growers entered the harvest season with an unusually low water supply for protective purposes. Nevertheless, Wisconsin has produced a fair crop, the quality of which can best be expressed by the word

"excellent". The extremely low purchasing power of the masses rendered more difficult the disposition of this and the large crops of Massachusetts and New Jersey. This economic condition is being alleviated in part, but the day will come when a more equitable distribution of wealth must prevail.

Sometimes I feel that the growers of the near future will look back upon these obstacles with which you have contended as blessings, for they have called forth in you the pluck and determination that was so prevalent among the early pioneer cranberry growers. Men of mettle turn disappointments into helps as the oyster turns into pearl the sand that annoys it. Whenever and wherever possible you have strengthened your water supplies. You of the Wisconsin River Valley area have turned the Wisconsin river waters into your reservoirs, an improvement for all time to come, and this action on your part hastens the day when Wisconsin will rank second as a cranberry producing state, and first as a producer of quality. And thus the adjustment continues and problem after problem meets its solution.

I well remember when the sphagnum moss problem was of great concern throughout the state. It is seldom referred to now. In like manner the fruit worm and fire worm problems have been reduced greatly after a study of their manner of life and habits and the application of treatments with which to reduce their number. For a quarter of a century, the false blossom seemed about to decimate the cranberry beds. It is now generally believed, with the scientific investigations giving us the nature of the disease and its manner of spread, we are in a better position to combat its ravages and perhaps retain badly infested areas.

We sometimes hear the fear expressed that the insect pests will so predominate on this earth that eventual starvation for man will result; that scientists tell us that no insect group has been completely annihilated from this planet. However, with our entomologists, who study insects, their population, their habits, and the problems their habits give us, together with the observing eye of our field men and Federal research department, we have ample grounds to believe the correctness of the Biblical verse, "The earth shall yield her fruit, and ye shall eat your fill".

It is now nearly fifty years ago that a group of cranberry growers of the state assembled in the manner that we meet here this afternoon that they might, through one another's observations and experiences, produce a better berry and a better crop.

RESUMÉ OF 1933 CROP AND MARKET CONDITIONS

MR. A. U. CHANEY

I appreciate being with you. I always enjoy meeting with you.

I want to say that we did have a big crop in the East, bigger than we thought. We think 450,000 barrels will be shipped out of Massachusetts, and around 140,000 to 145,000 barrels from New Jersey, with 45,000 out of this state. That is 125,000 barrels more than last year, and 75,000 barrels more than we expected. They were mostly Early Blacks. Sixty per cent of the Cape Cods were Early Blacks, and thirty-seven per cent of the production of the United States this year were Early Blacks. That is a very good berry, but this year they were over-size and over-ripe. The Blacks weren't under water, but they had rains that kept the berries growing and prevented harvesting.

In Cape Cod they harvest the berries on their knees, and cannot be expected to work on their knees when the vines are so wet. Many of the Blacks weren't harvested until late in October, and they should have been harvested in September. Those rains also induced the Late Howes to continue to grow and not ripen. The Howes didn't get overly ripe, but they were overly large, and this increased the crop. They are of excellent quality, and not over-ripe.

The Late Howes could not be marketed to any extent as long as there were other berries on the market that were a little cheaper. The price of cranberries was five and ten cents, or three for a quarter, and sometimes less, and consequently in every market they wanted something they could retail for ten cents or less. They didn't want extra fancy berries, that could retail for eleven or twelve cents, and they had to compete with the ten cent berries. Therefore we could not sell the fancy berries while the Blacks hung around, and they hung around until Thanksgiving. Comparatively few berries went on the market for Thanksgiving other than Blacks, although there were a few of the Native Jersey and Wisconsin berries. We had mostly Howes left, and half of the Native Jerseys. We have had a tremendous sale of Howes for December since there was nothing else to be had. I presume three-fourths of the Howes are now sold, and they are still selling. Whether consumers will buy Howes at two for a quarter, is a question yet to be answered. The markets will be well supplied with Howes that cost \$8.00 at the shipping point, or \$9.00 delivered, in the Middle West. That means they will have to retail at 15¢, or two for 25¢, whereas they have been retailing for 10¢ or less. Whether they will go into consumption for the Christmas holiday market and clean up satisfactorily, none of us know. The trade has bought more liberally for the Holiday season because they had such a good clean up at Thanksgiving time. Many of the dealers expected an advance in prices, and probably still expect it. It is all a question of what consumer response will be. All of us are uneasy,—afraid the sudden advance from ten to fifteen cents in price will retard considerable consumption. If it doesn't, we will have few enough Howes on the growers' hands to have a nice finish on the price. Usually we have much higher or much lower prices after the Holidays. I think that considering the crop that you had, and considering that thirty-seven per cent of the total production was over-ripe Early Blacks, cranberry growers got off very well, compared with any other commodity on the market this year. They got off, as a whole, better than the apple and the citrus fruit growers. I feel encouraged as to the future. We probably won't get as large a crop of Blacks for some time. We had floods in New Jersey, and continuous rains on Cape Cod, that lasted so long they thought they would never stop, while you people here had a drought. I wish we could equalize it. I am sure the Eastern growers would have liked to have equalized it.

What makes the cranberry industry so interesting is that we never have two years alike. We never can say "We are going to do it different next year", because if we do we will probably be just wrong. Every year is different, and we have tried to meet conditions as we find them. That is what keeps us happy as cranberry growers and cranberry salesmen.

I am glad to have been back with you again.

WHY INSECT CONTROL PROBLEMS ARE ON THE INCREASE IN WISCONSIN

E. L. CHAMBERS

Following the two extensive scientific talks we have just heard there is not very much left for me to talk about. Your President has mentioned the fact that we still have plenty of pests in Wisconsin and in so doing has kindly suggested a subject, having intimated that I might tell you something of what you may expect in the way of an insect crop for another year. Naturally we do not want anyone to get the impression that the entomologists are lying down on the job, so in admitting that the problem is becoming greater each year, it might be advisable to outline some of the reasons.

I. CLIMATIC CONDITIONS

Probably the outstanding reason is the hot, dry seasons we have experienced during the past three years. Scale insects, plant lice and borers of various types are always much more abundant during such seasons since the mortality is less in the absence of frequent rains, low temperatures and beating storms. Nature tends to off-set heavy losses to the various stages of insects by providing for the laying of hundreds of eggs or giving birth to enormous numbers of progeny by each individual and, consequently, during seasons favorable for their development such a large percentage of insects are allowed to survive that they make serious inroads on their favorite host plant crops. Long seasons permit development of additional generations and mild winters favor their survival during their dormant stage. Under such ideal winter conditions as we have had for their development these insects build up a population year after year until checked by adverse growing seasons.

II. CULTURAL PRACTICES

Reducing the number of plants and at the same time reducing the varieties, as we do in clearing up timber land and planting to such crops as corn and potatoes, naturally necessitates the concentration of the only existing insect population on whatever crops are available.

The pea aphid has recently become so serious as to make the growing of canning peas almost unprofitable. Most of this pea aphid development may be attributed to the fact that alfalfa growing has developed from the few acres of twenty years ago to nearly 600,000 acres in Wisconsin at the present time. Unfortunately the alfalfa being a perennial and growing in the vicinity of pea-growing areas, provides ideal winter environment for the pea louse as well as feeding grounds, during the spring, until the pea crop appears.

To cultural practices again can also be attributed the development of our recent grasshopper outbreaks. In northern Wisconsin where these hoppers are most injurious, farm practices are ideal for their development. Here with cultivated crops surrounded by sandy waste land, road sides, railroad right-of-ways, and pasture lands, undisturbed by the plow, the hoppers after destroying the cultivated crops migrate back and lay their over-wintering eggs. If these areas were not available the control of the grasshopper would not be such a serious problem, since plowing-under infested fields will eliminate any further injury by burying the eggs at a depth in the soil where the hoppers will not be able to emerge. The practice of discing corn

ground rather than plowing it is becoming a popular practice for preparing a seed bed for oats but it does not bury eggs sufficiently to prevent the hoppers from emerging and, consequently, an opportunity for controlling the infestation in such fields is not taken advantage of. Down in the southwestern part of our state, we have seven counties where the pasture land has been almost entirely ruined by white grubs and the reason for this is faulty cultural practices. In most of the pastures in that vicinity you will find, instead of a green carpet of blue grass and clover, that they are black with a covering of rag weeds and other serious weeds. At one the hillsides were rich in the production of pastures and it was possible to develop a very prosperous dairy industry which has thrived for more than fifty years. Because of the failure to realize that the soil was being depleted by using the same fields for pasture land year after year without returning any fertilizer to the soil, the inevitable happened, and with the disappearing of the covering of grass on the hillsides, erosion set in, aided by the work of white grubs. Had there been a tight carpet of thrifty growing grass on these hillsides the June beetle, the adult stage of the white grub, would not have been able to find ideal conditions for its development and the carpet would have been maintained. As soon as the carpet began to wear out and large patches were destroyed by white grub, the rains washed great gullies in the hills and practically ruined many of the valuable farms. At the present time you doubtlessly are familiar with the activities of the E. C. W. in attempting to save some of these farms by a soil erosion project. A series of concrete dams are being built to block up the ditches being formed by the heavy rains. There has been considerable criticism raised by some of the public that too much money is being expended in the building of concrete walls compared with the amount of labor employed. At a conference held in the Commissioner's office recently with members of the Legislature and agricultural leaders from that section of the state, we suggested that it might be well to spend some of the money in re-carpeting the hillsides with blue grass and clover and spraying oak trees to reduce the June beetle population and correct this evil at the top of the hill, rather than attempt to block it at the bottom.

III. ACCIDENTAL INTRODUCTION OF ANY PEST BY AIR, AUTO AND RAILWAY

When we consider that one-half of the serious insect pests we have today are of foreign origin and were brought into this country on horticultural products from the various foreign shores, we realize the danger of accidental introduction of new pests by boat and rail. With the advent of the auto and the airplane we are finding the problem even more complicated since it makes it possible to move infested materials long distances in such a short period of time that the chances of survival of the various insect pests and plant diseases is greater.

The Federal Government issues a report annually showing the interception of foreign pests made during the year and it is astounding to note the enormous number of interceptions of serious pests and we can not help but wonder whether others possibly have succeeded in getting by the inspection officials.

During the trip the Graf Zeppelin made to visit the World's Fair by way of South America, the inspection officials searched the passenger's baggage and the various compartments and intercepted several very serious pests that might have become established if the infested vegetables and fruit carrying these had been allowed to be disposed of carelessly in Chicago. This indicates that as long as we have methods of transportation we are going to have the danger of transporting

pests. A recent development in the spread of serious disease by transportation is illustrated by the discovery that the Dutch elm disease, which has recently become introduced into this country, was discovered on elm logs being brought in from Russia. It seems that these logs would not have been a serious menace in this country, although infected with the Dutch elm disease, had they not also been infested with one of the elm beetles which does not occur in this country and which is responsible for the spread of this disease in Russia and other sections of the world where the disease is prevalent.

IV. NATURAL SPREAD OF PESTS INTO STATE FROM ADJOINING INFESTED ONES

The spread of the European corn borer westward from the lake states and northeastern states illustrates about as well as any example we can give you of how some of these serious pests, not yet established in Wisconsin, are moving into the state. You will recall that two years ago a light infestation of corn borer was found in Manitowoc and Sheboygan counties and apparently stamped out the following year, but another light infestation was found in Racine county. During the past summer our corn borer scouts found light infestations in 19 townships in 10 counties along Lake Michigan.

Each year we are visited by the cotton leaf worm and the cotton ear worm which originate in the cotton fields of the sunny south. The cotton leaf worm does not appear until late in the fall but frequently the moths fly north in time to do serious injury to late strawberries. The corn ear worm, however, usually makes its flight during the early part of the summer and does very serious damage to our sweet corn as well as becoming a serious menace in greenhouses. This insect, as you know, can not survive our winters in Wisconsin and consequently, there would be no trouble from this pest if conditions were not favorable for the moths to fly north into our state.

This year we had serious infestations of the Chinch bug in Trempealeau, Buffalo and Pierce counties, and also in neighboring states of the south, but it had not been of any serious consequence in Wisconsin for many years previously. The population, however, has built up in these other states with the favorable seasons and with this development they have migrated into our state, and if weather conditions continue favorable for their development they will be present in such numbers, in some of these localities, to result in considerable damage in another year.

V. CHANGE OF INSECT'S FOOD HABITS

Insects, like all other animals, sometimes change their minds that it becomes the style to change their diet. You are familiar with the potato bug, and it may interest you to know that they fed on the Buffalo burr for years. When the white man began to reduce the abundance of this plant by cultivation, the potato beetle decided to take up one of the new cultivated crops as food and has given us a battle ever since. The flat-headed apple tree borer was originally contented to feed on oak, but with the replacement of oak forests with orchards, it adopted the apple tree as its new host. The strawberry root worm once restricted its diet to strawberry plants but suddenly took a liking to rose bushes and has become a serious pest to roses growing under glass when the soil for the benches in the greenhouse is secured from localities where strawberry plants are being grown. One of the most recent changes in food habits recorded has been by the strawberry weevil which was never known to show any liking for pine seedlings

until the past few years when it has become a very serious pest in nurseries where the larval stage feeds upon the roots of pine seedlings in the seed bed.

VI. REDUCTION IN NUMBERS OF NATURAL ENEMIES

We are frequently reminded by the lovers of birds that if nature were left alone she would maintain her balance without the aid of man in the way of deadly insecticides and mechanical control methods. I do not question the value of nature in her methods of maintaining such a balance but we are so interested in securing a livelihood today that we can not wait for nature to bring about her methods of control which require many years time to accomplish. We know that by eliminating cover crops and natural hiding places we have lost many of our valuable birds, and our dislike for some of the animals, including the skunk, has resulted in the hunting and killing of these animals to the point where they have become almost extinct. We know that all of these animals and birds have great value but, unfortunately, they sometimes do not restrict their diet to the things that we wish them to feed upon and destroy our cultivated crops, poultry etc. A campaign is being conducted at the present time by the Conservation Department to establish cover crops for quail and to encourage their increase in several of our southern counties. Whether this encouragement has a selfish motive in providing birds for shooting or whether they are really interested in reducing insect population we leave to your own conclusion.

VII. REDUCED EFFORT BECAUSE OF REDUCED INCOME TO THE FARMER

It is only natural that the farmer, who is trying to cut down his overhead, would eliminate the purchase of insecticides and equipment for their application when the crops being grown do not bring in sufficient revenue to much more than pay for the other items of expense involved. Consequently, there has been permitted built up a considerable population of many of our very serious pests. An outstanding example of how the farm orchards have been neglected can be gained by traveling between Madison and Green Bay during the summer and noticing the disappearance of the farm orchard. Most of the farmers find that they can buy apples cheaper than they can produce them, and they have too many other needs to attend to on the farm so the orchard seeming the least necessary, is apparently the most neglected. The canker worm has been allowed to defoliate orchard trees year after year for so many years that most of the trees have been killed outright and during the past few years, aided by the work of other pests, these orchards have practically disappeared. We have found the potato beetle, cabbage aphid, pea aphid, San Jose scale, oyster shell scale and many other of our most serious pests make rapid strides recently throughout the state because of reduced effort for their control resulting from a failure of the farmer to secure sufficient return so he felt warranted in carrying expense.

VIII. CURTAILMENT OF STATE AND FEDERAL AID

In a frantic attempt to balance the budget both the State and Federal Government have been compelled to discontinue many valuable services to the farmer and fruit grower and to reduce all projects to a point where the aid is so greatly hampered that those receiving the aid are very much aware of the cut. Sometimes it is hard for our office to explain why some of our valuable projects have been cut to a

point where the service is practically discontinued when we are spending large sums on new projects which do not directly benefit them and has only a prospect of benefitting the State sometime in the distant future. The reason for this is naturally because the Government is attempting to give employment to as many men as possible and we are carrying on active projects in Barberry eradication work and White Pine Blister Rust control, which has to be done eventually and offers very good opportunities for the employment of large numbers of men at what seems to be of great importance. While we ourselves do not have sufficient funds to carry on all of our necessary travel and we have reduced our personnel to a point where our services have had to be greatly hampered, we have plenty of funds available for the employment of men and the purchase of supplies for these unemployment projects, which seem to be the most important at this time in keeping up the morale of the country.

IX. IGNORANCE OF NATURAL FACTORS LIMITING THE NUMERICAL ABUNDANCE AND DISTRIBUTION OF MANY OF OUR INSECT PESTS

While the pure scientist is sometimes scoffed at because he does not seem to be turning out work which has a direct application, it is a known fact that much of our failure to find an immediate control measure or a temporary check of the spread of a serious pest is due to basic information which is furnished us by these men. We know, for instance, that the chinch bug outbreak of thirty or forty years ago was suddenly checked when a culture of a certain fungous disease was distributed and we have credited this fungus with bringing the chinch bug under control. We find now when we try to repeat such a practice that we do not always have as good results, showing that there are other natural factors involved that we are not sufficiently posted on which must be worked out by the scientists. Sometimes we attempt to bring about natural control by introducing natural parasites and do not get the desired results and upon making careful study we find that the number introduced does not begin to compare with the number already present. The pea canners, for instance, introduced nearly ten million lady bird beetles through our office from California last year in the principal pea-growing areas and there seemed to be a reduction in the number of pea aphids, but had we studied all the factors carefully we probably would have found that the weather conditions had as much to do with this as anything and that some other insect parasite would be equally as beneficial as the lady bird beetle. We were surprised to find that the number of lady bird beetles present in a pea field which was seriously infested with the pea louse, usually amounts to many times the number that was introduced before harvesting the crop, indicating that many more lady bird beetles would be necessary than were used in these tests.

X. PUBLIC OPINION BEING AROUSED AGAINST POISONOUS RESIDUES

The question of spray residues is a very delicate subject. Like all questions there are two sides to this one concerning danger to public health from spray residues.

We have always tried to keep the publicity on this subject under control and to avoid discussing it wherever possible because of the tendency of some of our Government chemists to exaggerate the possibility of injury which might take place where food was consumed shortly after it had received a spray treatment of some kind. From our experience during the past ten years in conferences with those who are

making strong statements concerning the possibilities of injuring the public health, we have come to the conclusion that they are not so interested in the health of the public as they are in commercializing at the expense of the helpless apple grower. We find no attempt made by these chemists, for example, to warn the public against the possibility of accumulating poison from alcoholic beverages or in drugs or lead poisoning from gasoline or even arsenical residues on vegetables and peaches. Their reply usually is to the effect that there is no practical way of eliminating these poisons in the other instances but in the case of the apple grower they have found it possible to eliminate any residue poison on the surface by complicated washing machinery, and so long as the apple grower wishes to place his product on the market he must comply with their regulations. We do not hear anything said by these chemists about the danger of being poisoned through the consumption of beer and yet it was the drinking of beer which carried some of these poisonous substances in England that started this whole agitation, and when you consider that the hop growers are finding it next to impossible to grow hops with the appearance of certain fungous diseases and realize that they are compelled to use enormous amounts of fungicides and insecticides, you wonder why these chemists do not concern themselves about the beer which is offered to the public. The fact of the matter is that the apple growers do not want to be responsible for injuring public health in the least and have and always will cooperate along with the entomologists and plant pathologists in reducing the amount of residue on their crop. Unfortunately, it is not possible to produce sound fruit without sprays with arsenicals and fungicides at the present time, and until we find that the fruit is any more liable to carry these poisons to the public than other food products and commodities, we feel that it is an injustice to the apple grower to have continual agitation brought up concerning the dangers of spray residues. In fact we believe that the situation can be summed up and explained by a story which we recently heard given by a speaker discussing conditions in Russia. He explained that the Russians were very proud of their hospitals and were anxious to show him through one of their children's hospitals, and when he consented to go through they requested him to don a white suit. After going through the hospital and noticing the place over-run with flies, the visitor could not help but inquire if they were not afraid of diseases being spread by these swarms of flies everywhere. The doctor in charge answered that they frequently had serious outbreaks of typhoid and other diseases in the hospital because of these flies. The visitor then expressed surprise that they were so particular about their clothing being covered with white suits when they made no attempt to control the flies. The doctor immediately replied that they had money to buy the suits with but no money to buy screens to keep the flies out.

We understand that there is to be a re-organization of the U. S. Department of Agriculture and some changes made in the Food and Drug regulations of that department and we are hoping that a little better cooperation will develop between the various Divisions of the Federal Department in the near future and that a little more study will be given this matter of spray residues before taking any more drastic steps which may cripple the fruit growing industry in this country.

I wish to bring one other matter to your attention this afternoon which I believe should interest all of you. A scientist is looked upon sometimes as being a little narrow and the public is inclined to believe that too much time is spent in studying details. We are of the opinion that the opposite is the situation and that more time should be spent in studying the details and getting the basic facts. To il-

lustrate my point I wish to explain that when rice-growing was first undertaken in California, the results were very erratic and, generally speaking, the growing of this crop was proving unsuccessful. The Government sent one scientist after another to carry on the research work in hopes that the missing link could be discovered. Finally they decided to start from the scratch and bring in someone who knew nothing about growing rice but who was a trained scientist skilled in the art of getting at the bottom of things and recording the facts. Consequently, they selected a man who had never seen rice grown to this purpose. In his scientific way he turned out elaborate experiments and as soon as his co-workers were trained to receive their instructions, he met with opposition. They advised him that the problem of the amount of water that should be used on the crop had already been thoroughly worked out and that nothing further need be done on that particular phase of the matter. This trained scientist, however, replied that maybe they knew but he did not. Carrying out his original plan, he discovered that where three, four or five inches of water were used on the rice field a very poor crop was secured, as well as in plots where eight inches were used, but that there was one point where the crop was unusually satisfactory, which I believe was when the water was applied at a depth of approximately seven inches. Using this depth as a basis for future plantings, their troubles disappeared and they soon learned that the whole trouble lay in the fact that they were not using the proper amount of water. Today they can grow rice in California even better than they can in China.

We have recently found that strawberry growers who have been growing this crop for years have not known how to handle their crop to best advantage. In our nursery inspection work we were finding that there was serious winter loss despite the fact that the growers were mulching their strawberries. The result was that there was very few salable plants in the spring and a very small crop of berries harvested. At first the nurserymen felt that it was a fungous disease and asked us to assist them in solving the problem of its control. In our observations we found no evidence of a primary fungous disease and consequently arranged to have some experimental plots carried on by Professor Roherst of the University of Wisconsin on the question of mulching. The chart, which we have on the wall, indicates the date of covering, the temperature and the yield. From this investigation it was learned that the usual practice of waiting until the ground was frozen sufficiently to permit driving on the bed, was too late for the proper protection of the plants. You will note that the plants covered the last of October yielded 108 crates to the acre, while those that were covered on the tenth of November yielded 106 crates. Again you will notice that when the mulch was placed on the plants the fifteenth of November the yield was 138 crates and where it was not put on until the last of November the yield dropped to 79. Those covered on the fifth of December yielded only 51 crates per acre. The result in this experiment where no covering was used you will notice, was only 33 crates to the acre. From these figures it is evident that covering the plants too soon reduces the crop by preventing proper plant growth and that covering too late does not give ample winter protection during the first early cold spells when apparently the most danger results. The point that I wish to make is that some of you cranberry growers have been growing cranberries a long time and since some of you have been having difficulty in solving winter injury problems, it occurred to me that it might be possible that you did not have sufficient information on your winter covering to permit you to handle your crop to best advantage. We have, therefore, prepared this chart showing that the temperature last winter here in Wisconsin Rapids fell to zero on the fifteenth of November and

on the fifteenth of December it fell to 29 below zero at which time we understand some of the bogs had not yet been covered. In some of these instances we understand there was not sufficient water to cover with while in others we are told that the water was being withheld because of fear of injury to the vines if the water was placed on too early from lack of oxygen before the fruit could be removed in the spring. Most of our cranberry growers are keeping rather accurate records of their activities and bog cultural methods. We believe that every cranberry grower should keep records of this kind. When you get a bumper crop you will want to know how you handled the bog to secure these results. In talking to some of the older cranberry growers we are told that in the early days of the cranberry industry in Wisconsin, there was nothing heard of winter injury or injury to the vines from a lack of oxygen in the water. In being questioned on their method of procedure they explained that it was very simple in those days. We are told that just as soon as the crop was harvested the bog was fruited and forgotten about until April or May of the following year. Maybe some accurate experiments carried on would be of benefit to your industry in determining just when the water should be applied and when it should be taken off. Our office is not in position to experiment because we have no bogs in which to experiment and consequently we will have to depend on the records we can secure from you growers. For your own satisfaction and good we would suggest that you begin experimenting and determine for yourself the best conditions for growing your crop on your own bogs and that you follow these methods regardless of how they may be doing it elsewhere. Experiment on other methods of procedure, however, as you go along.

1933 INSECT SITUATION IN WISCONSIN AND CONTROL METHODS

VERNON C. GOLDSWORTHY

The last three years with their dryness have done much to increase the insect population on Wisconsin marshes. Insects never before reported on Wisconsin marshes have made their appearance and to date have done thousands of dollars worth of damage. The cranberry girdler for example which had never been known to damage cranberry vines in Wisconsin until last year, 1932, did extensive injury in both the Mather and Cranmoor districts and is present on practically any and all marshes in the state, although on some marshes it is not as extensive as on others, but may build up much as does the black head fire worm. This year the girdler did not work as much as last year, and consequently the damage is not as extensive as it was the previous year. Injured areas should be resanded this year if possible. Sanding is helpful as it gives injured vines a chance to re-root above the injury, destroys the ideal environment which the girdler larvae prefers, covers up the pupae so that the moths have difficulty or are not able to emerge at all the following spring, and lastly discourages moths from laying on newly sanded marsh where the eggs may be readily destroyed and the young do not have a suitable home. Flooding, of course, should be practiced in the early fall whenever the larvae are noticed, if possible.

Fruit worm (*Mineola vaccinii*) was particularly bad this year and destroyed many hundred dollars worth of fruit. Fruit worm is our most difficult insect to control and up to date no satisfactory method

for its control has ever been worked out. Sanding, destruction of wild fruit surrounding the marsh in which they breed, putting water on early in the fall for two weeks when the water is warm (60° F) all help some, but none of these methods give very good control. Trichogramma parasites were tried the last two years and while they seemed to be of a benefit, I found they did not give as good a control as hoped for, although it is extremely difficult to check closely.

The cranberry leaf-miner (*Coptodisca negligence*) which is strictly a Wisconsin cranberry insect and has never been reported on any other cranberry marsh, except in Wisconsin, is increasing particularly on the northern marshes. Excellent method of control has been worked out by the author which consists of a nicotine sulfate spray applied shortly after the moths emerge and before they have a chance to lay eggs for the next year's brood of leaf-miners. Usually three sprays must be applied at intervals of three or four days as the moths do not all emerge at the same time. The adult moth appears about July 4th. There is one brood a year.

The leaf-hopper population on Wisconsin marshes is increasing and false blossom is spreading. Do not think for one minute because you cannot note its spread readily with the naked eye that it is not spreading. False blossom is an insidious thing and is spreading unquestionably on every marsh in the state to some extent and will continue to spread as long as the blunt-nosed leaf-hopper (*Euscelis striatulus*) is present and diseased vines are available as a source of the virus. Some marshes do not have many of the blunt-nosed leaf-hoppers, the only carriers of the disease, but on any marshes where the hoppers are present in any numbers they must be fought at once. Do not wait until there is a fair percentage of false blossom in a section, or leaf-hoppers three hundred to four hundred in a hundred sweeps—it is too late then for control, just like locking the stable after the horse is stolen. When 50% of the vines become infected it is merely a question of time when the balance will become worthless, unless, of course, drastic conditions alter its spread. Moreover, remember false blossom vines, once they become badly diseased, do not bear fruit and *never* recover. Just stop and think—suppose a section is 50% false, you are only getting one-half a crop, and you will never get any more, but less and less. Suppose you have a section of good Searls Jumbo and they yield 100 barrels to the acre. If the section becomes 50% infected, you lose fifty barrels and even at the low price of \$8.00 per barrel that means you are losing \$400 an acre, and on a marsh of twenty acres that would mean \$10,000 a year. Do not trust your eye to tell you if the disease is increasing—there is no man on earth, no matter who he is, that can positively tell the current year's infection and the only way an infection can be detected is by waiting at least one year and seeing the symptoms which we are all so familiar with, and when we see the symptoms the vine is hopelessly lost. Once again, let me caution you not to wait before practicing control if you have the leaf-hoppers in any quantity.

Vines vary in their susceptibility to false blossom, but no vines or variety are immune. McFarlin vines are quite resistant, but in the author's thesis an experiment reported and conducted under the direction of Mr. Bain and suggested by him proved very conclusively that the McFarlin will take the disease when exposed to the feeding of hoppers which have been infected by first feeding on diseased vines. Dr. Franklin in the East has proven the disease is insect borne, and a repetition of his experiments in Wisconsin by Bain, Rogers and Goldsworthy uphold this fact. Some growers still believe that cultural conditions cause false blossom, such as dryness or wetness. I will definitely state that I will give any cranberry plant that anyone in the world may pick out the disease of false blossom absolutely every time

by merely allowing infected hoppers to feed upon it, and the person can keep the plant under any cultural condition he desires. No one has ever proven or can prove that false blossom is caused by the cranberry plant being too wet or too dry, or any other cultural condition, although the environment in the field of dryness or wetness does affect the leaf-hopper population to some extent.

When this paper is published, there will be a list of the leaf-hopper population on every Wisconsin marsh compiled while I was in the state department. This report will give you some index of the leaf-hopper population on your marsh, but keep in mind that the leaf-hopper population is constantly fluctuating and where you now may have only a few on your marsh, in two or three years you may have a great many. Each grower should have an insect net and sweep on his marsh a number of times during the summer and keep in constant touch with the insect population on his marsh. In the east, nearly every grower has a net, making frequent use of the net, a procedure which would be well to follow in Wisconsin.

Control of the blunt-nosed leaf-hopper may be had by two methods, flooding, and spraying or dusting. Both, to be effective, must be done efficiently and at the proper time. Time is very essential as too late in the summer, after August 15th, is too late, and before June 25th in the spring is likewise ineffective. Control is much more effective if carried out on the nymphs rather than on the adults. The Sales Company next year will handle for Sales Company members only and at cost any of the spray material needed in controlling leaf-hoppers. Up to date we have used pyrethrum as a leaf-hopper spray. Possibly, however, it may be necessary to use something in the place of pyrethrum, an imported product, for if our monetary system keeps on changing in the foreign trade channels it will put pyrethrum too high for practical use. If this occurs, we will turn to derris or nicotine sulphate. Already pyrethrum has gone up several cents a pound this month.

To give you some idea of the extensive damage done by insects and which we do not realize, I want to say insects take about 20% of our crop one way or the other every year. In 1926 when we had a big crop, prices were high, the crop was worth around \$1,000,000. That would mean insects destroyed approximately \$250,000 worth of berries that year in Wisconsin. This year each grower would have added considerably to his income, roughly about one-fifth, if he could have removed insect damage. In New Jersey, for example, this estimate would run much higher as there acres and acres of once valuable cranberry land have been discarded at an enormous loss, because of false blossom and the girdler. Let us fight our insect pests before they do us extensive damage.

Vines are budded quite well for another year. I hope that those that were out this cold weather and will be out unless covered with snow, come through the winter in good shape. Cranmoor is fortunate in having a good water supply and that water certainly is a boon to those growers. I wish we all could have such a good supply until our normal precipitation returns, which I know it will. I believe that we are now swinging back to the cycle of wet years again, and the precipitation records this year prove this, but it has been so dry it takes a long time to build up the underground water supply which was so badly depleted. We must do more to keep down the fires and promote forest growth, as only by so doing are we able to obtain the maximum benefits of the rainfall which without this covering rushes away over the bare soil during a rain instead of soaking into the soil.

A word in regard to federal aid and in the way of loans to growers. The Sales Company office has been working on this and has obtained and furnished considerable data in regard to the soundness of such a

loan, insect and plant diseases, and cranberry information in general, for the Federal Land Bank. The outlook of obtaining loans seems bright, and apparently it will be but a short time when it may be possible, if nothing new intervenes, when we may be able to obtain money from the federal loan to farmers.

What are possibilities for next year in regard to cranberry marketing? The domestic demand for agricultural products has improved noticeably since March, 1933, and will undoubtedly continue to do so in 1934. The export trade has not been so good on account of high tariffs. Business activity is gaining in nearly all lines and this will naturally increase the market for agricultural products. Income of people in cities according to the Agricultural Outlook of 1934 by the U. S. Department of Economics decreased 50% from 1929 to July, 1933, which could not help but influence price and demand of agricultural products. Now, however, the practice of shorter hours and a minimum wage scale under the various codes under the N.R.A. have increased employment and payrolls, which in turn will be reflected in the price of agricultural commodities. Cranberries have moved remarkably well this year, when one considers the farm produce as a whole, in fact it is nothing short of a phenomena. This has been due without question to two factors; intelligent and farsighted advertising, and the manner of supplying the market as the demand is created, as is practiced by the American Cranberry Exchange. If you doubt advertising pays the producer, pick up any magazine and see the millions of dollars spent this way. Shrewd business men recognize the value of advertising.

There is no question and no room for argument that flooding a market ruins it hopelessly. To hold up prices, intelligent command and distribution are essential. A war was never won by each regiment going off and fighting by itself and as it chose. We would have laughed at such a ridiculous thing if it were suggested to us at the time of the World War, yet we are doing precisely that unless we co-operate in our sales. Too many cooks spoil the broth; too many sellers spoil the market.

Results of 100 Sweeps

Name	Date	<i>Euscelis striatulus</i> (Fallen)	<i>Euscelis vacinii</i> (Van D.)	<i>Thamnotettix</i> Species	<i>Deltocephalus</i> Species	<i>Platymetopus</i> Species	<i>Phlepsius</i> Species	<i>Cicadula</i> Species	<i>Gypsona</i> Species	<i>Draeculacephala</i> Species	<i>Agallia</i> Species	<i>Eutettix</i> Species	<i>Erythroneura</i> Species	<i>Scaphoides</i> Species	<i>Chlorotettix</i> Species	<i>Helochara</i> Species	<i>Euscelis</i> Species not <i>vacinii</i> or <i>striatulus</i>	All Others
George Bennett	8-15-32	2	7	4	6	1	2	8	1	8	1	1	2	1	2	6	2	3
A. E. Bennett	8-11-33	10	14	2	1		1	2	10	2			3		2	3	1	4
Phil Bennett	8-9-32	6	5	3				11	4	12	1	1	1	1	1	7	1	2
Guy Potter	9-2-33	1	1			2	1	12	3	5		3	3	2	1	3	4	3
O. O. Potter	9-3-33	18	12		3			14	2		1	1	2			1	2	2
Potter & Son	8-26-32	20	22	2	8		2	15	2	1		3	2	3		3	4	3
Midwest Cranberry Co.	8-15-32	2	2	1	3	2	1	11	1	12	2	2	1		1	1	1	2
Badger Cranberry Co.	8-29-33	4	3	2		2	3	8	3								2	2
K. B. Colton	8-28-33	48	32	2	7			13			4		2	1		1	9	2
Cranberry Lake Dev. Co.	8-20-33	50	24	10	10		4	92	8	14	18	3				1	7	4
Shamrock Cranberry Co.	8-19-32	2	4			1		52	41	4			5	1		9	2	1
Geo. Wolfinger	7-30-33							38			2				2	4	7	10
Herman Gebhardt	8-3-32	8	6					13	4	10	4				1	3	2	1
Henry Gebhardt	8-3-32	16	9	4	5		3	29	1				2	4	3	7	3	3
Loren Ellis	8-10-33	4	2					18			1		2	4			29	4
Walter Michalak	8-10-32	15	12	3	15	3	2	52		10		6				7		
C. Jepson & Co.	8-10-32	15	12					32		7					1	1	2	1
Elm Lake Cranberry Co.	8-1-33	2	5	2				10					3	4	2	4	2	4
Biron Cranberry Co.	7-25-33	25	27					52					8		2	1	3	1
Central Cranberry Co.	7-30-33	12	6	1	1			32							5	7	2	2
Lloyd Rezin	7-29-32	4	3					10								4	2	4
Wm. Rezin	7-30-33	8	12	3	2	4	3	7	2			4	7			1	2	4
Richard Rezin	8-1-32	9	15	1			3	11	1		6					1	2	2

Results of 100 Sweeps		Name	Date	Euscelis striatulus (Fallen)	Euscelis vaccinii (Van D.)	Thamnotettix Species	Deltocephalus Species	Platymetopius Species	Phlepsius Species	Cicadula Species	Gypsona Species	Draculacephala Species	Agallia Species	Eutettix Species	Erythroneura Species	Scaphoides Species	Chlorotettix Species	Helochara Species	Euscelis Species not vaccinii or striatulus	All Others
Jacob Searls	8-2-31	7	11	82	8					119		7		12				8	14	
Andrew Searls	8-2-31	8	6	29		3				72		3		4				4	9	2
Charles Bros.	8-12-32	2	1	11	7				4	15								4	12	3
Sucker Marsh	8-30-33			2	2					18	2		1					5	7	1
Mrs. Hoffman	7-28-32	15	12	4		2			3	29		15	3	2	1	2		6		
Grand Marsh	7-29-32	14	10	18	4					18	3	3	4	1					2	1
Case & Strozewski	7-15-32	15	7	2		6			2	34		11								
Albert Grimshaw	7-2-33		1	1	2					28	1		1		2	4		8		1
Palmer Marsh	7-9-32	7	13	7	1				7	7										
A. B. Scott	7-13-32	6	10	8					3	19								3	3	4
William Badgely	7-14-32	2		17						3	2	2	4	1	4	1			2	2
Will Hall	7-20-32	1	1	10	1				2	6		1							1	1
Crosset Cranberry Co.	7-21-32	4	3	32	1					29		2	4	1	6	1			12	2
Habelman Bros.	7-21-32	16	4	21						11				1	7	3		1	7	
Joe Schmidt	7-21-32	2	1	1					2	13	2	10		2				3	4	
Berlin Cranberry Co.	8-9-32	2	2	13	4					7										
Alfred Regalia	8-9-32	2	7	12					7	15	1	4			2		3	1	2	1
Tony Regalia	8-9-32	3	1	2					2	10		2	3			1	2	1	3	2
DeLong Dano	8-9-32	5	2	4	1					23			7		7	3		3		
Dan Doyle	8-1-33	2	2	1						19		2			4	4			3	
Ed. Kreuger	8-30-33	4	1							17	1				2	2			8	1
Tim Foley	8-29-31	6	8	2	1				7	8	4				8		4	1	7	
J. J. Emmerick	8-29-31	4	6			4				15	8		2		7	6			11	15
Mrs. A. C. Otto	8-1-32	14	10	1	2						8		6							

Weise & Hamre	7-25-33	30	4	8	10	7	2	15	1	3	4	3	1	2	1
Clark Treat	7-20-32	4	18	2	3	15	16	2	1	4	2	3	1	2	1
Vere Johnson	7-19-33	12	30	1	7	14	2	14	2	4	1	1	2	2	2
John Miller	7-19-33	2	8	2	1	6	3	1	9	1	1	3	4	4	1
Mrs. Weise	7-19-33	4	4	2	3	3	7	1	1	2	4	2	3	3	1
Minong Marsh	7-11-32	3	1	7	4	3	1	1	3	2	5	5	4	2	1
Searls Marsh at Hertle	8-1-33			7	2	2									
Williams Cranberry Co.	7-2-32	11	6	3	8	15		2							
Wetherby Cranberry Co.	7-9-32	38	22	9	4	11		2							
Union Cranberry Co. E. Marsh	7-10-32	23	4	2	1	2		3							
Mrs. P. Smith	7-1-32	8	7	19	2	72		1	4						
Walter Case	7-10-33			19		93		1							
Archie Case	7-18-33			9	18	13		4							
S. N. Whittlesey	7-11-32	19	5	9				7							
Union Cranberry Co.—Central Marsh															
Valley Junction Corp.	7-10-33	45	21	7	8	4		3							
Dempsey & Co.	8-2-31	15	21	7	15	39		2							
Gaynor Cranberry Co.	8-3-31	2	4	2	2	7		9							
Lester Cranberry Co.	8-11-32	19	12	1	2	14		15							
Joe Konkel	8-1-31	4	15	1	3	11		1							
John Getsinger	8-4-31	2	8	1	2	3		4							
Alvin Day	8-1-31	11	10	6	7	19		1							
Bessig Bros.	8-10-31	12	3	1	2	15		19							
R. W. Bailey	7-25-31	2	5	15	3	4		7							
Wild Marsh—Phillips	7-15-31	1	3	4	8	16		7							
Wild Marsh—City Point	8-3-30	21	28	18	2	1		2							
Wild Marsh—Mather	7-15-30	10	12	18	3	17		15							
Wild Marsh—Minong	7-20-30	3	8	4	2	2		14							
Wild Marsh—Spring Brook	8-5-30	16	2	3	11	8		8							
Wild Marsh—Wis. Rapids	8-5-30	1	8	20	3	1		2							
Wild Marsh—Warrens	7-21-30	6	6	5	3	1		4							
Wild Marsh—Shel Lake	7-27-30	19	10	21	1	18		1							
Wild Marsh—Portage	7-30-33	1	1	14	1	19		32							
Wild Marsh—Walker	7-9-33	3	1	8	1	32		2							

CRANBERRY HISTORY OF THE TOWN OF CRANMOOR

S. N. WHITTLESEY, 1933

Prior to the year 1870, for some time cranberries had been raked on the wild Wisconsin marsh lands by Indians and white men and transported to market principally by lumber rafts floated down the Wisconsin river to lumber market towns along the Mississippi river.

In September 1870 the Carey Brothers, a family of Irishmen, notoriously improvident and adventurous had gathered from their hitherto almost worthless swamp near Berlin, 10,000 barrels of cranberries and sold them to H. P. Stanley and Sons, of South Water Street, Chicago, for one hundred thousand dollars. The fame of this fabulous fruition spread, and my father, with an ear to the ground, bought forty acres of marsh joining the Careys, and sent for me to come and help him plant it. I was in Chicago—just twenty-one and on my own; had my grip packed and all I possessed—eight hundred dollars in my pocket and my purpose planned to go to Washington Territory to get possession of some of that big timber on Puget Sound. The habit of heeding my father's wishes prevailed and I returned to Berlin, planted cranberry vines, boarded with a farmer named Balch, listened to his talk and tale of thousands of acres of cranberry marsh good as Careys that could be bought for fifty cents an acre while that joining Careys would cost fifty dollars an acre.

The cranberry craze was catching and I caught it. Balch and I went exploring Juneau, Jackson and Wood counties. We drove a team and lumber wagon from Berlin west through Wautoma, Coloma and Friendship, across the Wisconsin River at Petenwell Rock to Necedah. Here we turned north on the almost impassible winter tote road of the Kingston Weston and Miner lumber company to Thompsons Landing, then a log banking point on the Yellow River about three miles north of where the station of Finley is now.

This part of the country was then a vast uninhabited wilderness of level wet marsh of spongy peat of two to twenty feet depth interspersed with islands of say two to two hundred acres of higher, harder sandy land, covered with pine, tamarack and tangled brush shading off to spaces of open marsh where patches of wild cranberry vines could be seen with their crop of ungathered red berries hanging on awaiting the coming of adventurous, fortuitous pioneers such as we.

All of Thanksgiving Day, 1870, I tramped on foot these watery wastes to find a spot on which to stake my fortune and my future. I got separated from Balch and Thompson and was lost in that trackless desolation. I was out all night, soaked to the waist and frozen stiff, and hungry. Luckily, I remembered the sun rose in the east so I turned that way—thought I could out-fame Robinson Crusoe.

In spite of this dampening dejection I bought in with Balch ten forties, 400 acres of State swamp land near where the station of Daly came into being in later years. The earthworks we made in 1871 are still discernable on the J. O. Daniels farm.

I became dissatisfied with my location and partner. After playing the game for eight months I walked out without a cent, although the experience gave me some additional common sense.

About that time Hank Beatty, an old surveyor and timber cruiser, who first bought the choicest fortys of the Arpin marsh and of the Thomas E. Nash marsh and who knew the country like a book told me to stop snivelling over my hard luck; that he could show me cranberry marsh so much better than the stuff I lost that I would be glad I lost it. He showed me to my present location in August of 1871. The only neighbors then discernable of kindred calling—cranberrying

—were Theodore Bearss, a Berlin man of high ideals, located a mile south of me and Ralph Smith, a collegian, lawyer and secluded gentleman two miles north of me.

There were no railroads, no wagon roads, and the walking was terrible. We had heard there was a place on the map somewhere called Grand Rapids but we had never seen it. We knew Necedah, but we did not know it was our most inaccessible point.

Early in 1872 people began to filter in hunting the cranberry Eldorado. William Skeel from Pine River and the Warner boys, brothers of Mat Bearss, Dayton R. Burr, Biggest and McNish and Kendall and Blackstone, from Berlin—the plague center.

Arthur Bennett, a freckled faced boy just out of school at Appleton, and his illustrious sire with Cape Cod information and perhaps experience, had started a transformation in the sage brush and moss just south of Ralph Smith in 1880, and heralded A. C. Bennett and son. M. O. Potter, a slender scion of those early days has outstripped most of us as his early purpose planned. The Gaynors succeeded or supplanted Biggest and McNish and Blackstone and Kendall. J. J. Emmerick grew up with the Gaynors. Mr. and Mrs. Geo. Scott were early settlers, so were the Rezins, Robert, Richard and Dan. The Searles brothers were pioneers and their shadow never grew less.

In 1873, H. W. Remington, who dispensed the destinies of the community on the Yellow River, a few miles west of us, came in from Tomah with the Wisconsin Valley Railroad, almost by our door. We got a side track and station. They named it Bearss, in honor of our leading citizen. Later years Mrs. W. H. Fitch disliked the name because wits and wags persisted in writing an extra vowel in the word where it would do the most mischief. Mrs. Fitch persuaded the Railroad and the post office department to change the name to Cranmoor.

John Arpin the venerable could drive a horse drawn vehicle from his city home to Pine Lodge, my log house, then he must walk a mile or two to his marsh. He used to leave his two little boys, Dan and Ermon with Mrs. Whittlesey, and she would play the piano for them while the father was gone. They said they had never seen a piano before. Will wonders never cease?

Railroad rivalry was rife and first we knew the Green Bay and Western had built a line across our cranberry kingdom from east to west.

One day the writer, being still young and unencumbered, assayed to walk to the county seat, via Ralph Smith's wooden railroad built on stilts and the Green Bay and Western railways. At a domicile beside the track we met Andrew Searles, who apologized for not inviting us in to eat because a girl baby had just arrived, and not yet been given audience with strangers, but had been given the name of Mayme Searles. It must have pleased her for we have never heard that she ever found one that pleased her better.

To you looking forward it may look a long way from youth to old age, but looking back it seems too brief. On the whole, it is good, as good generally as we choose to make it. Co-operation helps a lot.

Cranberry growing in Wisconsin is not a snap. I have been at it for nearly 63 years. I have found it necessary to put back into the plantation for upkeep and improvements all the returns I get over a very modest living. Most of us are still in debt, and without our very efficient marketing organization that every grower is in duty bound to join, we could not even live.

IN MEMORIAM

WHEREAS, Death has called Henry Gebhardt, a faithful and active member of this Association, one who was known for his cooperative spirit and kindness to everyone, be it

Resolved, That we spread upon the minutes of this meeting an expression of esteem and sorrow at his passing and convey to the surviving family our sympathy.

S. N. WHITTLESEY,
A. E. BENNETT,
O. O. POTTER.

IN MEMORIAM

Divine Providence has seen fit to remove Bernard, the young son of Mr. and Mrs. Joe Wirtz, therefore be it

Resolved, That this Association extend sympathy to the bereaved parents and family and that this expression be recorded in the minutes of this meeting.

ROY M. POTTER,
GUY NASH.

FINANCIAL STATEMENT OF WISCONSIN STATE CRANBERRY GROWERS ASSOCIATION

		Receipts	Disbursements
Jan. 1	Balance on hand.....	\$174.88	
Jan. 16	Check No. 127 Joe Arnold, orchestra.....		\$ 12.00
Jan. 16	Dues	30.00	
Jan. 18	Dues	2.00	
Jan. 18	Check No. 128 L. P. Daniels		10.00
Jan. 22	Check No. 129 C. S. Smith—salary and expenses to 1/1/33		47.76
Jan. 27	Dues	18.00	
Mar. 7	Check No. 130 H. J. Rahmlow—47 subscriptions to Horti. ..		18.80
Mar. 20	Dues	4.00	
Apr. 11	Check No. 131 Mrs. Irma Schroeder—Steno. report—Dec. ...		10.00
Apr. 12	Check No. 132 A. C. Rockwood—stamped envelopes, stamps.		1.93
July 12	Check No. 133 C. S. Smith—salary 7/1/33, post. on report pr.		40.70
July 19	Check No. 134 A. C. Rockwood, wrappers, stamps, cards, envel.		6.38
	Federal check tax18
Aug. 10	Dues	8.00	
Sept. 5	Dues	2.00	
Oct. 13	Check No. 135 Mrs. Irma Schroeder—steno. report, Aug....		10.00
Dec. 4	Check No. 136 A. C. Rockwood—125 dou. post cards, envel.		3.82
Dec. 15	Dues	42.00	
Dec. 15	Check No. 137 Goggins, Brazeau, Graves, legal service.....		40.00
Dec. 28	Check No. 138 C. S. Smith, salary to Jan. 1, 1934.....		40.00
	Check Tax08
Dec. 23	Dues	10.00	
		<hr/>	
		\$290.88	\$241.65
Jan. 1, 1934	Balance on hand		49.23
		<hr/>	
		\$290.88	\$290.88
Jan. 1, 1934	Unpaid Bills: Mrs. I. Schroeder, Stenographic Services..	\$10.00	
	Balance, Goggins, Brazeau, Graves.....	22.75	
	Horticulture Society, Subs. 1934.....	16.40	