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Wisconsin State Cranberry Growers Association
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Wisconsin State
Cranberry Growers' Association

THIRTY-FIFTH ANNUAL MEETING

Wisconsin Rapids, Wisconsin
January 10, 1922

THIRTY-FOURTH SUMMER MEETING

Pavilion, Near Nekoosa, Wisconsin
August 9, 1921

Wisconsin State
Cranberry Growers' Association

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LETTER OF TRANSMITTAL.

To the Honorable JOHN J. BLAINE,

Governor of Wisconsin.

Dear Sir: I have the honor to submit herewith the Thirty-fifth Annual Report of the Wisconsin State Cranberry Growers' Association, containing papers read with discussions, and a financal statement for the year 1921.

Very respectfully yours,

MRS. S. N. WHITTLESEY,

Secretary

Cranmoor, Wis., January 10, 1922.

MINUTES OF THE THIRTY-FIFTH ANNUAL MEETING.

The thirty-fifth annual gathering or the Wisconsin State Cranberry Growers' Association began Monday evening, Jan. 9, at the Elks Hall in Wisconsin Rapids, Wis., with an illustrated lecture on Plant Disease Control by Prof. R. E. Vaughan, of the University of Wisconsin. Prof. Vaughan's discourse was interesting and instructive; the lantern slides showing clearly the ravages of disease, drouth, frost and insect pests in contrast with normal conditions of plants and plant life.

The meeting proper convened at the City Hall Tuesday morning, Jan. 10, with an attendance of more than fifty, representing growers from nearly all the cranberry sections of the state, and included Mr. G. A. Babcock, manager of a marsh at Walton, Mich. President Searls occupied the chair. First on the program was the minutes of the previous meeting and letters of regret and felicitation read by the Secretary, after which President Searls gave his views on "The cause of Wisconsin's 1921 crop shortage and what could have been done to prevent it." As President Searls spoke without note or paper, it is with keen regret that we cannot present the full import of his address.

The President's andress was followed by other papers and discussions which will appear in the annual report, as will the financial statement for the year 1921.

The only change in officers for the year 1922 was that of president, Mr. Searls expressing a decided wish to be relieved from further service. Mr. Chas. L. Lewis, Jr., of Beaver Brook, received the full endorsement of the convention for that office.

The day was full to the close. The final subject for consideration was the place to hold the Aug. 8, 1922, meeting. As none of the marshes are adequately equipped for this purpose, prevailing choice seemed to be the pavilion where the recent summer conventions have been held.

MRS. S. N. WHITTLESEY,
Secretary.

PLANT DISEASE CONTROL[1]

R. E. VAUGHAN.

The control of plant diseases is one of the questions of first importance to those interested in growing crops, and one which frequently requires much study for solution. The cause of the disease may vary and with the difference in cause comes a difference in control measures which apply. If the trouble is due to too low temperature or too much water, the remedy is usually easy or at least easily understood; but if the trouble is due to ravages of some fungus or bacterial organism it is often difficult to understand and control it.

It is only within the last 50 or 75 years that scientific understanding of the relations between parasitic fungi and crop disease has been developed, but within that time great advances in plant disease control have been made. Our forefathers took the presence of rusts and blights

[1] This address was illustrated by lantern slides showing the various types of plant diseases and their control.

as a matter of course or considered them due to the weather and unavoidable. But we know that most of these troubles are due to specific organisms. The part which weather conditions play is also better understood; for example, the fungus which causes cabbage yellows does not manifest itself until the temperature of the soil rises above 62 degrees F. Such factors as these are the result of years of research. Other crop diseases are continually yielding up their hidden secrets and the relation between environmental conditions and diseases is becoming better understood.

There are four main lines of approach to the control of plant diseases: (1) exclusion, (2) sanitation, (3) protection or spraying and (4) disease resistance.

Exclusion.—The exclusion of plant disease is very difficult to accomplish because we are constantly bringing in new plants from foreign countries where their conditions of growth are different from those obtaining here. The conditions which hold their enemies in check are not always present in the new location and new diseases may be encountered. In order to prevent the introduction of plant diseases as far as possible, the United States Government in 1912 passed a Plant Quarantine Act, which gives the Secretary of Agriculture power to deny entry to any plant or plant product that is shown to harbor plant insects or diseases. Corn and its products from the Philippines, Java and Oriental countries are now under quarantine because of the corn mildew which is destroying many acres of this crop. Some examples of diseases which gained a foothold in our country before the quarantine law was passed are: pine blister rust from Germany, and chestnut blight and citrus canker from the Orient. There may be state as well as national quarantine laws and even communities may agree among themselves to prevent the introduction of any plants thought to be dangerous.

Plant Sanitation.—Under the head of plant sanitation may be considered the control of plant disease by extermination of one host where the fungus has two host plants on which it lives; for example, the barberry in the case of black stem rust of grains, red cedar in the case of apple rust and wild gooseberries and currants in the case of pine blister rust. Again, we may accomplish the extermination of fungi on certain seeds and on potato tubers by seed treatment. Examples of such treatment are formaldehyde disinfection of oats for the control of smut and the corrosive sublimate treatment of potatoes for the control of scab, black scurf and black leg.

Some diseases can be held in check by changing farm operations, for example, the time of planting of wheat or corn has an important bearing on the amount of seedling blight and root rot. If wheat is planted when soil temperature is high, there is more trouble from fungus blight, while the opposite is true in the case of corn. This relation between the temperature of the soil and the liability of grain and corn to root troubles has been brought out by intensive research studies carried on jointly by the United States Department of Agriculture and the Wisconsin Experiment Station at the laboratory of the Department of Plant Pathology, Madison.

Plant disease can sometimes be controlled by changing the reaction of the soil, as in the case of cabbage club root, which is much less prevalent where lime has been added to the soil to reduce its acidity. Drainage is also important in making conditions unfavorable for many soil fungi, as the cabbage club root and the damping off fungi, which are frequently found in tobacco or other beds of small plants.

The time of plowing may have an inhibiting effect on the spread of fungus spores from plant refuse. The early plowing of orchards, for example, covers up many apple and cherry leaves in which the fungi causing apple scab and cherry leaf spot are over-wintered. In order to find out this relation between plowing and orchard diseases, it was necessary to carry on careful studies on the life histories of the fungi concerned and find when their spores or fruiting bodies were discharged to infect the new growth of leaves or fruit.

Sometimes the sanitary measures consists of cutting out the diseased parts, as in the case of fire blight and canker in apple and pear trees. Careful pruning out of all hold-over cankers and the complete uprooting of diseased trees of such badly blighting varieties as the Transcendant Crab are the best ways to handle this problem.

Plant Protection.—A few years before the experiment stations were established in the several states, a Frenchman by the name of Millardet had discovered that a mixture of copper sulphate solution and lime would control grape mildew when sprinkled or later sprayed on the vines. This mixture came to be known as Bordeaux Mixture and was so widely advocated by the fruit and vegetable departments of the experiment stations that spraying came to be thought of in the popular mind as the cure for all plant diseases. There are, as a matter of fact, only a few diseases that can be controlled by spraying, and the operation is one of uncertainty, involving bother and expense. Greatest success has been obtained in spraying grapes for the control of mildew, potato vines for late blight and leaf hooper, apples for scab, codling moth and several other diseases and insects. In recent years the practice of applying the fungicides and insecticides in the form of dust has been advocated in some sections. This method has its advantages and disadvantages as compared with the liquid spray method.

Disease Resistance.—The control of plant diseases by the use of varieties or strains of plants which are so constituted that they can resist disease constitutes the greatest advance in recent years. When it is possible to cut down losses in this way, it is time for everybody to sit up and take notice. We now have varieties of apples that blight or rust very little, tobacco that resists the deadly black root rot, flax that does not wilt, wheat that is highly resistant to black stem rust, and strains of Hollander and All Season cabbage that will give a highly profitable crop when the soil is so "cabbage sick" that unselected sorts are a complete failure. These new sorts have come about as the result of careful selection, sometimes combined with cross breeding to combine desirable qualities, and the rejection of countless numbers of strains which did not come up to standard. Very few resistant plants have come into general use by accident.

They have come because somebody somewhere was earnestly seeking to improve a certain plant. What has been done with some plants can be done with others.

HOW I KILLED THE FRUIT WORM YET SAVED A GOOD CROP

LYDIA M. HUYCK.

The cranberry fruit worm is a beautiful irridescent creature, and contrary to the common opinion of her character, she is gentle and kindly.

I have known many fruit worms intimately, yet I can affirm that not one of them ever has kicked me really hard, nor has one of them ever seriously bitten me. Of all the creatures I have ever known, the gentle little fruit worm seems the most responsive and appreciative of loving care and considerate attention.

Many years ago when granddaddy fruit worm was alive, or maybe it was dear old grandma, I used to be told something like this:

"You keep your eye open along about May first and select a warm spell. You let the water stay on until that warm spell has arrived and then you let the water off, all of it, down to the nice clean weedless bed of sand. (Of course all of us have our cranberry vines growing thickly over nice clean weedless beds of sand.)

Well, having let the water all off, you let the sun during this warm spell I was talking about, warm up the sand and the vines but of course you must not let it start the vines to growing too much. The nice little warm eggs or bugs or just worms, having been hibernating down in the nice clean sand all winter. The warm sun expands their souls, and their souls swell up and the worms just are obliged to climb out of the sand and go up on the vines, anyhow they come out in the open.

You then put the water back on the vines. It must be just the right kind of nice clean cold water. If you get it on real quickly and everything else is just right, and no flumes wash out and no dykes give way, do you know what will happen? Why you catch the dear little fruit worm out away from home and the cold water gives him epizootic and he becomes too ill to bore into a single cranberry all year."

This yarn sounded sort of plausible to me, and so every spring I hunt for just the right sort of vines and sand and water and sun shine and flumes and dykes and everything, and carry out all of the traditional measures to give the poor little worm epizootic. And sometimes apparently I succeed, for behold we haven't any worms at all that year.

But once in a while we can't get just the right spell of sun shine or the clean sand isn't there or the water isn't nice and icy (ever fall into it?) or the worms wear rubber boots or something and along

towards the middle of July it becomes apparent that a very exciting race is going to be held. The race is going to be whether the worms will have enough berries to keep them going until August or not. Like the reports of last summer's cranberry convention, the situation looks bad. It really looked as though there would be a lot of poor little worms starve to death. Measures for relief and famine prevention really must be taken at once.

Clare Searls and his father are consummate sportsmen. They will take a chance in a good cause any time and their bump of self preservation is well located. They are partners in our marsh and we have very many times had reason to be glad of their partnership.

Over the long distance 'phone they said "Poor little worms, mustn't let them starve if we can help it. You might try a very desperate experiment, which we tried, but which probably we didn't do right because we are men and don't watch details. Being a woman with nothing else to do, maybe you can make it work.

"You build a fence out of boards, water tight, about a rod square in a corner of your best section. You select a cloudy day and you just flood that little piece with cold water. Maybe you can drown the worms, and as drowning is much better than starving maybe you will attain ultimate happiness."

We got busy with boards and built a water-tight fence in a corner of our prize section where the berries and worms would run perhaps 150 bbl. per acre, and on August 9, 1921, the weather was cool and cloudy. We let the water on that afternoon and the fence leaked so we let the water onto the whole section, say about an acre. The next morning was cloudy and cold. It was with misgiving we let the water stay on all day, thinking of the poor little worms, then we let it stay on the second night. That night there was a frost and we flooded the whole marsh. The second morning we drained everything, and the sun came out and it warmed up. The berries in the treated section looked just like regular cranberries. The worms in the punctured cranberries, to our pleasure, had nearly everyone of them attained a state wherein it was plain they were in no possible danger of ultimate starvation.

We couldn't for the life of us find any water damage to the unpunctured berries, tho of course those which were worm eaten were also water-logged. After a few days one could pick up a fine big berry with a worm hole where the worm had entered, and could on cracking the berry open find the dear little worm all nice and brown and moldy and dead. He never would starve.

We were encouraged and we tried it on another section with equal success.

In conclusion, it appears that if you have cold water and cool weather and worms, you can use the cool weather and the cold water to clean up the worms so long as you get rid of the water before the sun can warm it up or scald the berries. Where this scheme was tried and failed, apparently they didn't have cold water, or didn't have nice warm harbors in clean warm sand, or didn't have

water proof cranberries. We will be glad to furnish any interested parties for a price, cuttings to any extent desired from our water proof cranberry vines.

BEST VARIETY OF CRANBERRY VINES FOR WISCONSIN

HENRY H. GEBHARDT.

Sometime ago I saw an advertisement of a large, plump animal. An advertisement of one who sells meat. Underneath the picture were these words: "The best is none too good for me." I thought how appropriate that was to the one who is in the cranberry game, or one who contemplates going into it. "The best is none too good." The question is then—What variety is the best to plant in Wisconsin? As no two persons were alike it is impossible for me to think for each one and have all come to the same conclusion. We can all agree upon what the market demands, that is—good, sound, well colored fruit. As for the varieties, I can speak only from kinds grown on marshes that have come under my personal observation.

I would suggest that early, semi-early, and late varieties be planted and that these are of good color, fairly large in size, and of good keeping quality.

I believe all three varieties can be found that will meet these requirements. I would plant the early variety next to the reservoir semi-early next and then the late kind, harvesting them in the same order. I would plant the early variety next to the reservoir because the ground there on ordinary marshes is somewhat higher there than the ground farther away, this would permit of draining the reservoir more completely in case of frost. If I were to replant or make a new marsh under present conditions, I would follow these suggestions and plant three varieties, namely, "Gebhardt Beauty", Seymour Beauty", and the "McFarlin".

The Gebhardt Beauty is a native of my wild marsh, is a large round berry, uniform in size, good color and fair keeping quality. It is very early and a fine berry to harvest, either to pick or rake.

The Seymour Beauty is a pear shaped berry, semi-early, also of good color, uniform size and a good keeper. This berry will color up nicely even if gathered somewhat green and is exceptionally nice when left to color fully upon the vines. Owing to its long shape it would be hard to clean under ordinary conditions, but as it is a very sound firm berry it can be run over any machine with jumpers by placing a cloth over the upper jump and permitting berries to go to the table without any jumps and thus eliminating all seconds.

The McFarlin is a large late berry, not so uniform in size but an excellent keeper and of beautiful color when fully ripe. The McFarlin can be kept very late in the season.

I have several other varieties of cranberry vines but I speak of these three because I have them and know what they are and they would be my preference above all others if I were to replant or make over my grounds.

As I am not in the business of seling vines, nor do I intend to go into that business, I give you the facts as I see them.

SECOND YEAR DEVELOPMENT OF THE BIRON BOG

GUY NASH.

The second year developement of the Biron Bog is a short story for but little was planned and even less accomplished. We left. at the end of the season of 1920, three sections rough levelled to settle over winter. The work for 1921 consisted of ditching, final levelling and sanding and planting these three sections, besides the usual care of the four sections planted in 1920.

This program did not go strictly according to schedule. The Rood dredge had been completed too late the preceding fall to enable us to try it out. The ground was very soft, so soft a man could not walk on it in many places and dried slowly, while after it had drained sufficiently to enable the machine to operate, some repairs and changes had to be made in the machine itself. The levelling in turn could not be done till the center ditches were dug and the earth removed. Sanding with the railroad and dump cars proceeded satisfactorily, but the whole thing together made such a delay it was July before we were ready to plant.

The vines had been cut in May before growth started and the bales had been placed in the drainage ditch as had been done the year before, but the previous June had been normal while last June was, as you remember, abnormally hot and dry. The vines looked good when planting commenced but it soon became evident they had lost their vitality and we discontinued planting after one section and part of another had been finished. In fact the vines planted the first half of July did not do so well as those planted on the 20th of August during the preceding year. We count on replanting the part set out this year as well as planting the balance.

Fire threatened the upper marsh in August and September and to safeguard it the flow of water in the drainage ditch was stopped. The drainage is so good that with the flow above stopped, even with everything lower down shut up we could not hold the level high enough to keep the sand moist on the newly sanded sections. It was a choice of burning the upper marsh or risking the sand drifting, and in places the latter happened. There was no drifting where the vines were set, and elsewhere it varied from none at all to spots where all the sand went into ditches.

The cost of the various operations was about half what it was in 1920, this being in part due to lower wages, in part to better methods, but chiefly to the greater efficiency of labor.

Besides regular development work a good deal was done in the latter part of the season in cleaning up and levelling for roads the spoil banks of the drainage ditches on the marsh, levelling the dyke bank between sections, and breaking and disking the upper marsh.

The chief lesson learned was to re-emphasize what we already knew, the necessity of having work so far advanced on sections to be panted that nothing can interfere with early planting. At the same time the heaving and settling of the first winter changes the bog level enough that a more uneven bog will result from final levelling and sanding without prior first winter's settling. The bog is all underlaid with quicksand and gravel and the drainage is excellent, sometimes too excellent as was the case with our newly sanded sections last September. This being the case we have in mind to make the next sections developed a couple of rods narrower than the present ones which are ten rods from center to center, and to do away with the center ditch.

LANDMARKS IN THE 1921 CRANBERRY SEASON.

O. G. MALDE, Tomah, Wis.

To me the cranberry season of 1921 has appeared full of landmarks or peculiarly notable happenings in crop production, under varying conditions, on various bogs of the state. What I would term the chief of these so-called landmark events are as follows, given in the order of their importance as I would place them:

1. General Crop Shortage, or Who Got the Crop?
2. Frosts.
3. Drought.
4. Insects.
5. Water Supplies.
6. Markets, or Supply and Demand.
7. Home Markets—Are They Neglected?

My interpretation of these factors I will try to make brief, in fact, I fear some of them may be blunt, as I feel I have the advantage of being an insider looking from the outside, yet tempering my viewpoint in hopes that some little kernel or germ may be effective in the stimulation of some part of this highly specialized industry into a higher place in the agricultural activities of the State, and especially to awaken a greater interest and confidence in the industry among the people already engaged. I cannot help but feel that far too many do not have the cranberry business truly at heart, therefore do not do their own vocation the most good possible, for themselves, the industry, or the community in which they have their holdings.

To avoid repetition I will discuss Item 1. last and proceed with a discussion of frosts. I consider frost second in importance, not because of damage done the past year, but because of the general damage that it is permitted to do. I contend that frost, in 90 per cent of the losses caused, is an unnecessary loss and consequently a needless hazard.

This may seem like a very broad statement, yet I feel fully warranted in the assertion, in view of the fact that from observing the handling of the bogs of the various districts, the growers take too many long chances on frosts by waiting until the last minute before applying a flood on critical nights, and also because, by not making a regular practice of evening temperature readings that would eliminate any guess work in the matter of evening conditions at least.

The common statement "I don't think it will freeze tonight" or "It does not seem very cold tonight" and the matter then dismissed for that night, has cost many a grower a large part of a prospective crop.

I repeat what I have often said, "The human being is a poor thermometer" and his physical condition is largely responsible for his feeling of warmth or cold, hence the condition favorable for a frost may be overlooked because "It doesn't seem very cold tonight."

I believe frost losses last season (the middle of May and the first week in June) were no exception and I could point out cases of loss due entirely to the fact that instruments were not consulted, and the security in one's feeling that "It won't freeze tonight" set such cares aside for the night, with the result that the next morning the frost harvester had gathered his toll.

Here in Wisconsin, our cranberry growing has the best of conditions available for a great success, yet this is conditioned on vigilance and the elimination of all possible hazards by regular and systematic dependence on the records of instruments more sensitive than the human body to heat and cold or barometric pressure.

Let me repeat again what I have asserted before, that we in Wisconsin take too many chances on frosts after our bog temperatures have reached 40 degrees. We are very prone to speak of blighted blossom buds and blighted young fruit after July, yet I challenge anyone to prove that here in Wisconsin, over 50 per cent. of this is not due to exposure of the blossom buds, blossoms and very young fruit to too much chilling temperature (40 degrees to 32 degrees) in this critical or infantile stage of this crop, which if, as on our best sand bogs would have the benefit of the tempering influence of the sand, (as explained last August in connection with the air temperature data summary for sanded and unsanded bogs in Wisconsin).

The 1921 season was no exception, the frost claimed a heavy toll and I believe much of it was preventable. The only hope is that the losers learn the lesson that will cause them to correct the future management of their bogs so as to reduce this hazard.

Drought was probably of next importance the past season, it was unquestionably the driest season since 1895, with reservoirs dry that have never been known to be dry since they were built.

Again the sanded bogs have made a demonstration worthy of the study of the most skeptical, you who poo-hoo the sanding idea as an innovation unnecessary and expensive, whether it be for new planting or as applied to old bogs to reclaim them. I repeat again, the show-

ing of the sanded bogs challenges your best criticism and honest study on your own behalf, not merely for what is claimed for it, but for what it has done in the earning of dollars the past season.

I contend the sanded bogs old or new have this year vindicated the claims made for them, and they have more strongly confirmed the fact that the safest system of bog construction in Wisconsin is the sanded bog, which reduces many other hazards.

Another factor strongly emphasized by this drought is the value of a pumping plant in a dry season and at critical times.

Droughts are unavoidable and the only way one can protect against them is a better and systematic method of water control, pondage and cooperative use of flood waters and drainage waters upon which I wish to touch briefly a little later.

Insects like frosts, have taken their toll without much being done to eradicate them, and with the dry season to their advantage, so beware of them next season.

Eternal vigilance and careful observation should be the watchwords in the cranberry industry, and this is especially true with reference to insect pests, for in finding the first of the brood lies the surest step of control, and every cranberry insect infesting Wisconsin bogs is controllable if attacked in its weakest stage and when the smallest numbers are to be fought. This is naturally in the spring, and is especially true in the case of the fireworm when the first brood must be attacked.

Control for the various pests has been discussed by our association before and you have discussion on it again today in some phase. I merely want to emphasize, that the vine eating worms that have done so much damage the past two or three years can be controlled if careful observation is made and the insect discovered early in the season and flooding then resorted to. However, as has often been asserted before, many of our bogs must be put into a cleaner condition before insect pests can be successfully combated. He who does not make this effort will have them with him a long time and only luck will save his crop from damage.

The shortage of the water supply in all the districts, especially in the larger ones the past season of drought, is of vital importance in showing that closest cooperation in the use and handling of water is needed in the industry. To my mind the cranberry men should unite on securing one or two members in the next legislature to work for an amendment of the drainage laws, permitting a liberal use of water from drain ditches for irrigation purposes and the use of certain check backs to be maintained in these drainage ditches during dry periods to maintain a safer water table.

As I understand it, these drainage laws are not what they should be to give the cranberry grower a fair chance at drainage waters originating in areas within their natural and original source of supply. A growers' committee on this might help.

The outstanding feature in the matter of water supply the past season is, that the bogs with individual supplies, as is the case with most of the bogs in the northen part of the state, were the least af-

fected by water shortage during the season. In the large districts, as stated before, much closer cooperation in securing and handling water seems to be needed, in fact, I believe that the consolidation of several bogs in one community, putting them under one management on equal terms, if it could be secured, would be a desirable and successful move toward a greater stability of the cranberry bogs of the district.

I venture this forecast; that if districts like the Mather district or the Cranmoor district could thus be consolidated, the water question could be more adequately dealt with and would insure greater safety in the maintenance of a permanent water supply.

Markets, or the supply and demand seem to me to show a particularly notable feature for the past season with the rather small crop and prevailing high prices, high prices in spite of much unemployment, a questionable demand from the purchasing public due to a strained financial situation and money shortage among the "common people."

I will not elaborate on this as representatives of the Cranberry Exchange are with you and can cover the field, but I emphasize that this is a landmark that bids fair for the future of the industry. Much credit for this, I believe, is due the sales company and the cranberry exchange.

Home Markets—Are They Neglected? I claim they are, and for that reason we have to speak of the H. C. C. as we would of the H. C. L. This high cost of cranberries is well illustrated in the grocery stores of Tomah, where Cape Cod cranberries were found three and four weeks before Thanksgiving, and upon being questioned one grocer said he could not secure local cranberries, yet hundreds of barrels were produced within 12 miles and many within three miles of the city. It is evident that such a grocer buys only from salesmen or jobbers. However, it seems that producers should be interested in supplying home trade with fruit rather than see the same kind of fruit come into the community shipped half way across the continent. Very likely most of the eastern fruit in question had come through Tomah in a shipment to LaCrosse and a return shipment made to Tomah. This kind of distribution is probably desirable for the railroads, but not for the buying public.

I contend that the fact our local markets are not thoroughly canvassed and supplied by the State Sales Company by supplying local fruit that they expose one of their weak points that very materially aids in fostering the independent distributor as a needed factor, at least in local distribution. My point is, that it seems that local fruit should be available or offered for sale to all local (Wisconsin) dealers by the time Wisconsin shipments are commencing, so that the long freight hauls would not need to be taxed to consumers living within view of cranberry bogs.

Now as to the most important feature of the crop season of 1921, "The General Crop Shortage" or "Who Got the Crop." I am greatly impressed again with the showing of the newer bogs, which, as I have

mentioned before in this paper, have demonstrated the benefit of sand on Wisconsin bogs and this also supplies to clean culture in general, and it in itself represents a challenge to the old style unkempt marsh, which with but few exceptions has not been able to withstand the peculiarities of the last season and produce a normal crop. All the indications are that the fellow that got the crop last season is the fellow that was most vigilant and had his bog cleaned up well and in most cases well sanded, and I challenge anyone to show any great deviation from the fact that the least frost damage, blight and insect ravages, as well as the best crop in yield, size and maturity of fruit at harvest, was on the best tended, most carefully watched over and best sanded bogs (whether planted on sand or old bog reclaimed by sanding), this because more and easier protection could be rendered and hazards reduced.

The past season has really been quite a remarkable one in the many general demonstrations that could be observed along the line of special features touched upon in this paper, and there are numerous other points that offer similar and interesting consideration, but time will not permit.

Minneapolis, Minn., Dec. 15, 1921.

Mrs. S. N. Whittlesey,
Cranmoor, Wis.
My Dear Mrs. Whittlesey:

I have your letter of the 13th and have carefully noted contents. First let me thank you for your congratulations upon our good crop. Naturally I ascribe the good crop to the fact that we resanded last year, or rather last winter. Then, too, our foreman was on the job on the evening of the 4th of June and had our crop under water. But I will make a careful review of conditions with our foreman and if there is anything that I can present at the meeting in January I will be very glad to do so.

Very sincerely yours,
Albert Hedler,
of Cranberry Lake Development Company Bog at Phillips, Wis.

Warrens, Wis., Dec. 27, 1921.

Mrs. S. N. Whittlesey,
Cranmoor, Wis.
Dear Mrs. Whittlesey:

Both Mr. Purviance and Mr. Kissinger report good budding on our bogs. We hope for a fairly good crop next season on both bogs, but realize that there is nothing certain about this cranberry game.

The Wetherby Cranberry Company has no special complaint to make, as our yield was larger in proportion than any of the other bogs in this vicinity, but the Union Cranberry Company had nothing worth mentioning, and I believe Mr. Hoffman did not harvest any berries at all. The reason for the difference is not at all clear to me, and in spite of the different theories advanced I am still quite undecided as to the real difficulty. I know we suffered from the tipworm, and the ravages of the fruit worm were especially destructive this season, taking the entire top crop from the Wetherby bog.

Yours truly,
F. R. Barber.

Tomah, Wis., Dec. 27, 1921.

Mrs. S. N. Whittlesey,
Cranmoor, Wis.
Dear Mrs. Whittlesey:

In reply to your letter of Dec. 13th, will state conditions as they were here. In the fall of 1920 the budding was poor—we went into the winter with a light flood. During the winter our outlet went out twice, exposing the vines to some severe weather during February and March. We had our severe loss at that time, thus giving us a poor start in the spring of 1921.

In 1920 we were severely hit by fireworm. They were scattered all over the marsh and in one or two places took everything, but the vines came on all right and the fruit buds set for our 1921 crop.

In the spring the vines came along nicely (those that survived the winter) and we had a fairly good blossoming. If the fruit had come on we would have had 500 barrels, but when the berries began to set they just dried up. Wherever the vine produced two fruit shoots from one upright (and this was the case in nearly every upright which had been hit by fireworm the summer previous) the vine did not have vitality enough to produce the fruit. In other words, wherever one could find fruit it was produced on single uprights from a lone bud.

During the past season we had very little fireworm. What there was appeared very scattered, and early in the fall the vines seemed to recover well from the attack and due to the late fall they set buds and came on very well. We have a good flood on now and are hoping for a larger crop next year.

Yours truly,
Vere Johnson.

EXCERPTS FROM LETTERS RECEIVED

"The main problem before the growers today is to increase their crops and improve the quality of same. By continued advertising we have increased the demand more rapidly than we have increased the supply and it is important that the supply be increased in order to give the people what they want."

A. U. Chaney,
New York City.

"May I suggest that I think more publicity should be given to cranberries in the newspapers north, south, east and west. Freight rates are too high. Cost of package too much. Barrels, $1.00; half-barrel boxes, 50 cents. Cost of marketing is too much."

Lucian J. Fosdick,
Boston, Mass.

We are publishing the letters of Dr. Shear and Doctor Stevens in full, as the information given and desired should attract the attention of all growers. Dr. Stevens' request may stimulate some record keeping in the future. No one seems to have kept any data heretofore.

December 7, 1921.

Mrs. S. N. Whittlesey, Secretary,
Wisconsin State Cranberry Growers' Association,
Cranmoor, Wisconsin.
Dear Mrs. Whittlesey:

Replying to your kind favor of the 5th inst. I regret to say that it will not be practicable for me or Dr. Stevens to attend your next an-

nual meeting in January, and I fear that if we came, we could not supply you with any very practical new information in regard to cranberry troubles.

We are still working on the subject of cranberry diseases but find that the litte we are learning is so small compared with the vast number of things yet to be learned that it seems somewhat discouraging.

I appreciate very much your kind words and am only regretful that we have not done more to deserve them.

In so far as the disease situation in your state is concerned, it does not look at present as though it would be practicable or profitable in many cases to practise spraying for fungous diseases alone. If it should be found that it is profitable to spray for insects, it would then be very desirable at add Bordeaux mixture to your insecticide spray. In general the most practical methods of reducing losses from fungous diseases are to improve as much as practicable the conditions of growth of the vines. Where old bogs are renewed or new ones planted the most improved methods of drainage, irrigation and clean cultivation should be practiced and special attention given to the selection of the most vigorous, hardy and disease-free plants.

Dr. Stevens is going to write you in regard to some questions relating to climatic conditions and their relation to disease and keeping quality.

Regreting that we can be of no more service to you in this connection and wishing you a very pleasant and profitable meeting, I remain

Very truly yours,
C. L. Shear
Pathologist

December 9, 1921

Mrs. S. N. Whittlesey,
Cranmoor, Wisconsin.
Dear Mrs. Whittlesey:

Most papers read at your meeting are designed to give information to your members. Would you be willing to read a letter which merely asks information from your members?

For the past six months I have been at work on a study of the possible relation of weather conditions during the growing season to the keeping quality of the cranberry crop. Of course you will readily understand that on so complex a problem one does not progress very fast, nor reach at once any very definite conclusions. However I have hopes that eventually we may get results of interest and value.

So far this study has been confined to Cape Cod because that seemed to be the only locality where printed records of the keeping quality of the crop were available. In order to include Wisconsin, we must have reliable data as to the keeping quality of the crop there for a number of years, and to ask for this information is the purpose of this letter.

What we need is information regarding the keeping quality of the cranberry crop, without reference to the size of the crop or market conditions. Probably there will be years in which the crop was not conspicuously good or bad. On the other hand there must have been seasons which stand out as having had particularly sound crops and others in which there was an unusual amount of trouble from rot.

Could you help us out in this matter to the extend of finding out, particularly from your more experienced members what they regard as conspicuously bad years as regards keeping quality. If you would be willing to take the time at your January meeting you might ask the members to list what they considered the two or three best and the two or three worst years in the last ten or fifteen years. Then check up and see how they agreed and give us the result. It may be that some of your members have diaries or other written records.

These of course are apt to be more reliable than anyone's memory.

Any information of this kind which you can get for us will be much appreciated and will, we hope, eventually make this work of interest and value to you.

With best personal regards and good wishes for a successful meeting, I am

Yours very truly,
Neil E. Stevens,
Pathologist.

DISCUSSIONS

Andrew Bissig:—Told of the 1912 season which he recollected as a damp growing season, saying that there was a great deal of trouble with the keeping quality of the berries that fall. He could not adjust differences between buyer and seller fast enough, 10 cars at a time being rejected at various places. He has some records of the season that are available.

F. R. Barber:—Told of hail injury and its bad effect on the keeping quality.

A. Searls:—Could recollect no bad year in particular except one year when his berries had been improperly handled.

President Searls called for reports by growers from the various districts.

Jacob Searls:—Reported a poor budding in the fall of 1920. 1921 crop short by 25 per cent., caused by the dry and hot weather of the summer. The blight was heavy and the tip worm was apparently the cause of much trouble.

F. R. Barber:—1920 fall budding good, but 1921 crop only 25 per cent normal. No frost damage during the season, but tip worm and fruit worm were the main causes of the shortage, also hurt by extremely hot and dry weather, which always seems to be favorable to the fruit worm.

A. Searls:—Speaking of the Phillips bog; the vines had never been resanded since they were planted and in 1921 the crop was light and the vines appeared weak. One half inch of sand was applied during the following winter and the winter flood allowed to drain as the ice melted. The bog was weeded of certain grasses in April and reflooded for 10 days in May. The vines showed development of fruit buds during April. The bloom was fine and 4500 bbls. were harvested.

Roy Potter:—Believes in sanding old bogs to renew vitality and shorten vine. 1921 crop good, but short of the prospect. Lost a few by frost but laid the general shortage to the unfavorable weather. The budding in the fall of 1921 good.

C. L. Lewis, Jr.—1921 crop good following a light crop in 1920. 1920 shortage mainly due to a poor budding. He is an advocate of pruning and resanding, which he believes greatly strengthens the vitality and productiveness of the vine. Believes there is a danger of winter injury in the northen districts in November and December if the bog is not protected, that is, if certain unfavorable weather conditions prevail. 1921 crop very uneven, one four acre piece averaged 104 bbls. per acre, while a 19 acre piece averaged only 25 bbls. per acre. Believes that by improved drainage on the 19 acre piece that the production can be raised. 1921 fall budding good.

Oscar Potter:—Good crop in 1920. Fine bloom in 1921 but nothing to harvest. Thinks that weather was the main cause, also considerable fruit worm damage.

AFTERNOON SESSION

Subject: Preparation of the soil.

Mr. Getsinger:—Mr. Getsinger told of his work in subduing 10 acres of sage and cut grass. He first set fire and burned off what would burn, mowed the remainder and raked it off. Plowed with 20 inch breaker, 20 inches deep, using a tractor for power. After being plowed the ground was rolled. The plowing and rolling cost $25 per acre. He claimed that if scalped in the old way the same work would have cost $250 per acre. The sections were kept under water until May to prevent the cut grass and neither the cut grass or sage appeared during the summer. Vines were planted thickly by being strewn over the ground and stamped in, the surface being very soft.

Henry Kissinger:—Tried two methods of planting. One section was plowed and not sanded. Another section was scalped and three inches of sand applied. Vines in both cases spudded in, now two years old and doing well in both methods.

Guy Nash:—Suggested preparing a section two years previous to planting to get the ground in better shape for planting. Also suggested applying fertilizer prior to sanding.

F. R. Barber:—Had used fertilizer but not very successfully. It greatly encouraged the grass growth in his case where it was used on old bog sanded after planting. Claimed that nitrate of soda is the best vine producer and potash the best all around fertilizer.

A. Searls:—Suggested applying fertilizer before sanding to evade grass growth that might otherwise result. He advanced as the best method to follow:—that of preparing the land in the fall, sanding in the winter and planting in the spring.

M. O. Potter:—Was asked to explain his use of what is known as the "Water Cure," a treatment for killing grass, introduced from New Jersey. He selected an area badly infested with grass that could be handled with respect to water as a unit. In the spring of 1919 he held the water on this piece until July 15th. This proved to be too late as the vines failed to bud and lost their leaves the next spring. He tried it again in the spring of 1921, holding the flood on until July 1. The vines were then drained down and they grew nicely and put on a fine budding that fall. In 1921 they produced a fine crop and this piece had never produced a crop before in many years. While the flood was on, any grass that threatened to grow up was kept mowed with a scythe under the water. In 1921 there was practically no grass on this piece. Mr. Potter added that ¼ to ½ inch of sand would be a great help to vines that had been flooded in this manner.

The opinion was expressed by a number of growers that the early spring was a very dangerous period, that the bud was liable to injury at times under conditions which the average grower regarded as perfectly safe periods.

M. O. Potter:—Remarked that a bud soaked with water is tender and more susceptible to chill and for this reason care should be taken not to expose the vines to frost for several days after withdrawing the winter flood, during which time the buds would dry out and become more hardy. He thought the safest and most natural way was to allow the water to drain off as the ice melts in the spring.

H. H. Gebhardt:—Claimed that a chill in the early spring weakens the bud, that he kept water under his vines until June 20th, to protect from frost injury or chilling the buds.

It was agreed that the fire-worm and fruit worm were more abundant during dry seasons. The fruit worm appeared as early as June 6th on the Rezin bog.

Pres. Searls in his address among other things said:—Causes of crop failure are many. One is old bog not sanded when planted or since. Vine doesn't take firm hold on clear peat. Old bog has surplus vine. Hard for moisture to reach fruit and long vines require more moisture. Frost attacks such bogs more often. No opportunity for heat to penetrate to bog. Level bog is necessary. Greatest shrinkage from unlevel bog where peat is deep. Bog should have at least 3 sand applications at alternate years—gives firm foot hold for plant, also warms ground. Sanded bed has been ten to twelve degrees warmer on cold nights. Mow off surplus vine so new uprights form. Scalping expensive—plow instead. Sand and plant a good cropper.

FINANCIAL STATEMENT OF THE WISCONSIN STATE CRANBERRY GROWERS' ASSOCIATION FOR THE CALENDAR YEAR, 1921.

RECEIPTS

Balance on hand January 1, 1921	$345.28
State appropriation, July 1, 1921	250.00
Dues collected	36.00
Total receipts	$631.28

DISBURSEMENTS

Secretary's salary from July 1, 1920, to July 1, 1921	$ 80.00	
Postage and supplies, July 1, 1920, to July 1, 1921	17.50	
Tribune Co. for Letterheads and Envelopes (August)	7.50	
State Printing Board, for Notices (September)	3.01	
Tribune Co., for Notices (December)	4.17	
Secretary's salary and expenses from July 1, 1921, to July 1, 1922	71.40	
Total disbursements		$183.58
Balance on hand January 1, 1922		447.70
Total		$631.28

Respectfully submitted:
MRS. S. N. WHITTLESEY, *Secretary.*

Mr. F. R. Barber's motion that the President be given a vote of thanks, received many seconds and the following expresses the sentiment of the entire Association:

RESOLVED, That the Wisconsin Cranberry Growers' Association tender to its retiring President Mr. Andrew Searls the hearty thanks of this Association for the many years of faithful service rendered, and that this expression of grateful appreciation be written into the records, and a copy thereof given to him.

This resolution was unanimously adopted.

From Pemberton, New Jersey, under date of Jan. 13, 1922, we learn of the death of Mr. Isaac W. Budd on May 26, 1921.

While Mr. Budd was not personally known to many of our members. his name has been on our Life Roll for many years, and he at one time attended a summer convention at Cranmoor.

This Association tenders sympathy to the surviving members of his family and regrets the loss of a valued member.

By the Secretary.

MINUTES OF THE AUGUST 1921 CONVENTION

The summer meeting of the Wisconsin State Cranberry Growers' Association was held at the Wisconsin Rapids street car Pavilion Tuesday, August 9, 1821.

President Searls called the assembly to order at 1:30 P. M. and speaking extemporaneously called attention to the benefits that should be derived from getting together to exchange ideas—get definite information regarding crops—plan to utilize water to best advantage—and pass on valuable experiences for future use.

The minutes of the previous meeting were called for, and after being read by the secretary were approved and accepted.

The secretary then read a number of letters containing kindly wishes for the members and meeting and regrets of inability to be present. Then followed a free-for-all discussion of the many problems affecting the grower, and so much time consumed, that Mr. Malde's valuable paper was but partly given; however it will appear in full in the next annual report, as well as a summary of the topics considered.

After appointing a committee to audit the bills overlooked at the January meeting, another on resolutions of regret at the loss by death of our esteemed member, Mr. J. D. Potter, and one to voice appreciation to Messrs. F. J. Wood, and Guy O. Babcock of the Wood County National Bank for the very generous and delicious refreshments, the convention adjourned to meet in Wisconsin Rapids, January 10, 1922.

MRS. S. N. WHITTLESEY, *Secretary.*

AUGUST MEETING 1921

DISCUSSION

A. U. Chaney:—Mr. Chaney gave a general report on crop conditions in the East. In New Jersey, generally speaking, water was drawn from the bogs April 15th. The season had not been especially favorable for the growth of the berries and they were small at this time of the year and there was still some question as to how well they would develop.

The Cape Cod crop early in July was estimated at 350,000 bbs. There had been some damage to unprotected bogs by May frosts, but not of extensive nature. However a large section of the Cape district was visited by excessive rains which assumed the proportion of cloudbursts during the blooming period in July and the crops in some of the large bogs had been entirely wiped out. In many cases the bogs were flooded with this rain water for from 24 to 48 hours. The shortage appeared to be mostly in the Early Blacks.

The crop of fruits generally promised to be short with the possible exception of the citrus fruits. The apple crop would average about one half the 1920 crop, the only section having a good yield being the Northwest where a good crop was looked for.

A. Searls, Pres:—"We have come together today for the purpose of exchanging ideas on our numerous problems. The present season seems to present more than the usual difficulties. We have rumors of scant crops in the Mather district, spotted crops in the Cranmoor dis-

trict and apparently good crops in the northern sections of the state and we should endeavor to thrash out the solutions of these difficulties. Apparently the fire-worm, frosts, tip-worm and the dry weather are responsible for the shortages and it is upon these enemies that we must direct our efforts. Although it is too early to get definite information on the size of crops, we are going to hear from representative growers from each district. The serious dry season which threatens to cut down our crop prospect should cause us to study the water problem with the view of utilizing our water to the best advantage. We want to tell of our various experiences, good and bad, so that they may be of value to others as well as ourselves in the future.

CROP PROSPECTS

Mrs. De Long:—Mrs. DeLong reported a prospect for 300 bbls—a light crop for her bog.

Henry Kissinger:—Mr. Kissinger also reported a light crop and lays the cause to poor budding the fall before, the only direct apparent cause being the tip-worm which was much in evidence. Old and young plantings were affected alike.

Miss Huyck:—Crop appeared to be about the same as last year, although it was a bit late. The fruit worms were appearing and flooding was contemplated to check them. She hoped that she would have some interesting information on this experiment by the time of the winter meeting.

A. Searls:—Remarked that Mr. Haskins, formerly of the Station, had advised flooding for the fruit worm, but emphasized the importance of using cool water, that stagnant water was unsatisfactory.

The consensus of opinion was that flooding for the fruit worm while the worms were at work is a precarious undertaking, but that there might be certain conditions under which this treatment may be applied without injury to the crop. The temperature and purity of the water used and the length of submergence and the weather during the treatment, are important considerations.

Mr. Case:—Early in the season the crop looked fine but the small berries had apparently been killed by the heat. The crop appeared to be only an average one at this time. No water to protect in case of frost but the bog was fairly wet.

Mr. Searls:—Remarked that his best crop appeared to be on the sections most often irrigated, the season being unusually dry.

Mr. N. S. Whittlesey:—Crop promised fine early in season but it now showed the effect of the heat and he expected about 1000 bbls.

Habelman:—Crop only fair. Some spring killing, some tip-worm and the fruit worms now working. Considerable blight and the late bloom berries were very small at this time.

C. L. Lewis, Jr.:—General prospects good. The bog contains a variety of conditions in its makeup which shows its effect in the resulting vine growth and crops. The peat varies in depth from nothing to 30 feet and was made perfectly level at the time of planting. Time has caused considerable settlement in the deep peat causing poor drainage on considerable area. This poorly drained area is weedy, thinly vined and poorly cropped. The higher portions of the bog have a very good crop. The crop is earlier than a year ago. Some fruit worm work in evidence but it is not serious.

Roy Potter:—About 1000 bbls. and water enough for six acres once.

F. R. Barber:—Outlook poor. Tip-worm and fireworm have been serious, have not been successful in flooding for fireworms, but perhaps the treatment had not been efficient. Water very scarce.

Sanford:—Poor budding in the fall of 1920, on Arpin bog, old marsh has a fair crop in sight, some indications of tipworm.

J. Searls:—Crop promises about 500 bbls. short of last year. Berries early, tipworm and fruit worm working. Best crop apparently in the drier sections.

Albert Hedler:—Crop prospect at Phillips bog good, perhaps some blight. All young vines and berries pretty well exposed. Berries early, no tipworm and little fruit worm.

A. Searls:—Added that the Phillips bog was planted on sand and that resanding had been neglected for several years causing a weak growth of vine and the cause of a poor crop in 1920.

K. B. Colton:—Spring Brook crop prospect good. Some spring killing and some fruit worm, but not serious.

O. G. Malde:—Had been over the different sections of the state. The Cranmoor district was very spotted and many growers were short of water for flooding. The frost of June 3rd hit some bogs, but the most serious injury was caused by the tipworm and fireworm. In the northern part of the state where the bogs were planted on sand the tipworm injury is slight. The Mather district shows much worm injury and is also short of water.

Mrs. S. N. Whittlesey:—Advanced the opinion that the dry season emphasized the fact that the association should ask the Legislature for aid for further testing out water pumps similar to the Mitchell pump experiment.

At this point Mr. Babcock of the Wood County National Bank invited the members of the association to partake of refreshments and a recess was declared.

Mrs. S. N. Whittlesey:—Made a plea for a generous display of cranberries at the State Fair. She emphasized the importance of a good exhibit with a large number of exhibitors and remarked that it was the duty of all growers to send a few samples, they need send only a pint of each kind.

A. Searls:—Added that only samples of the best varieties be sent, that a display of the best croppers and highest grade berries encouraged the planting of the best varieties, while the display of inferior varieties was harmful to the industry.

F. R. Barber:—Remarked that the State Fair presented a wonderful opportunity for advertising the cranberry, by a proper display.

The question of wages during harvesting was discussed and the opinions expressed were that from 30 cents per hour with board to 40 cents and board would be the prevailing wage. Suggestions were made that a system of bonus for amount of work performed be put in practice.

Mr. Case:—Suggested that the Association use its influence to procure the passage of a bill through the State Legislature permitting the damming of certain drainage ditches in the cranberry district, so that the water therefrom could be utilized for flooding purposes.

LOCAL FORECASTING OF HIS OWN CRANBERRY BOG VERY IMPORTANT FOR THE WISCONSIN CRANBERRY GROWER

By O. G. MALDE, Tomah, Wis.

The forecasts of the U. S. Weather Bureau together with their daily weather maps are practically indispensable to the cranberry growers and this is especially true of the Wisconsin growers.

There are certain local conditions, however, that often develop unexpectedly in the Wisconsin cranberry regions and which cannot be foretold by the Weather Bureau in their morning forecasts, nor even in their special afternoon forecasts, because these conditions develop late in the afternoon or early in the evening.

The Wisconsin growers, therefore, need to be especially vigilant on account of these possible, sudden, unforeseen, local changes and should accustom themselves to making forecasts for their own individual locations.

From data gathered over a period of several years at the Cranberry Experiment Station at Cranmoor, I have devised a simple method of forecasting minimum temperatures, that I believe can be safely followed by any Wisconsin grower who will provide himself with the few necessary instruments, and familiarize himself with the local conditions that must be considered in making predictions.

After several years of comparison between the evening dew point and the minimum temperature of the night following on unsanded bogs, it was found, that under normal conditions the average range or difference was about 17 degrees. By normal conditions is meant a normal barometer and a normal direction and velocity of wind for the locality. Seventeen degrees was therefore adopted as a constant or basis from which to figure the minimum temperature.

For each tenth of an inch that the barometer is above normal, three degrees should be added to the constant, and vice versa. For each four degrees that the daily maximum thermometer registers below 75 degrees, on a clear day, with a westerly, northerly or northeast wind prevailing, and with a stationary or slowly rising barometer, add one degree to the constant.

Other local conditions that should be considered, but which require local experience to be admitted in the calculations are; condition of the sky, regularity or irregularity of the wind, presence of fog, and peculiarities of it, presence of a bright Aurora in the northern skies, inactivity of insects and frogs.

To forecast satisfactorily a grower should possess:

1. Maximum Registering Thermometer exposed in a standard shelter.
2. One minimum registering thermometer exposed in a standard shelter.
3. One minimum registering thermometer at the coldest place known in the cranberry bog or adjoining it on the wild marsh.
4. One barometer (registering barograph is best) which may be kept in the house or on the porch.

5. One sling psychrometer (for determining the dew point).
6. One weather vane (for easily determining direction of the wind).

The use of the barometer is important in that it shows the movement of the atmospheric pressure fluctuations, whether above or below normal, if rising or falling at time of observation.

On the barograph these changes can be readily detected, while on the mercurial thermometer several readings a day are needed to note the fluctuation of the pressure.

The sling psychrometer which consists of two thermometers mounted on the same support, is for the use of determining the temperature at the dew point, the starting point in this method of forecasting. To find the dew point the bulb of one thermometer is wrapped with a covering of thin guaze and saturated with water, the other bulb being dry. The psychrometer is whirled in the air for a few seconds. During the whirling the evaporation of the water from the wet bulb causes the temperature of this thermometer to fall and the whirling is continued until the temperature of the wet bulb will decline no further. The difference in readings between the wet and the dry bulbs is noted and then applied to certain tables which accompany the psychrometer the temperature of the dew point can be determined.

By using the accompanying diagram, which is adapted from the U. S. Forest Service Bull. No. 104, a simpler and easier method than the "table method" of finding the dew point is presented.

In this diagram the dry air temperature is represented by the lines ruled across it horizontally, while the curved lines starting at the upper left hand corner and tending to the right and down toward the lower right hand corner, represent the degrees of difference between the dry bulb and the wet bulb readings.

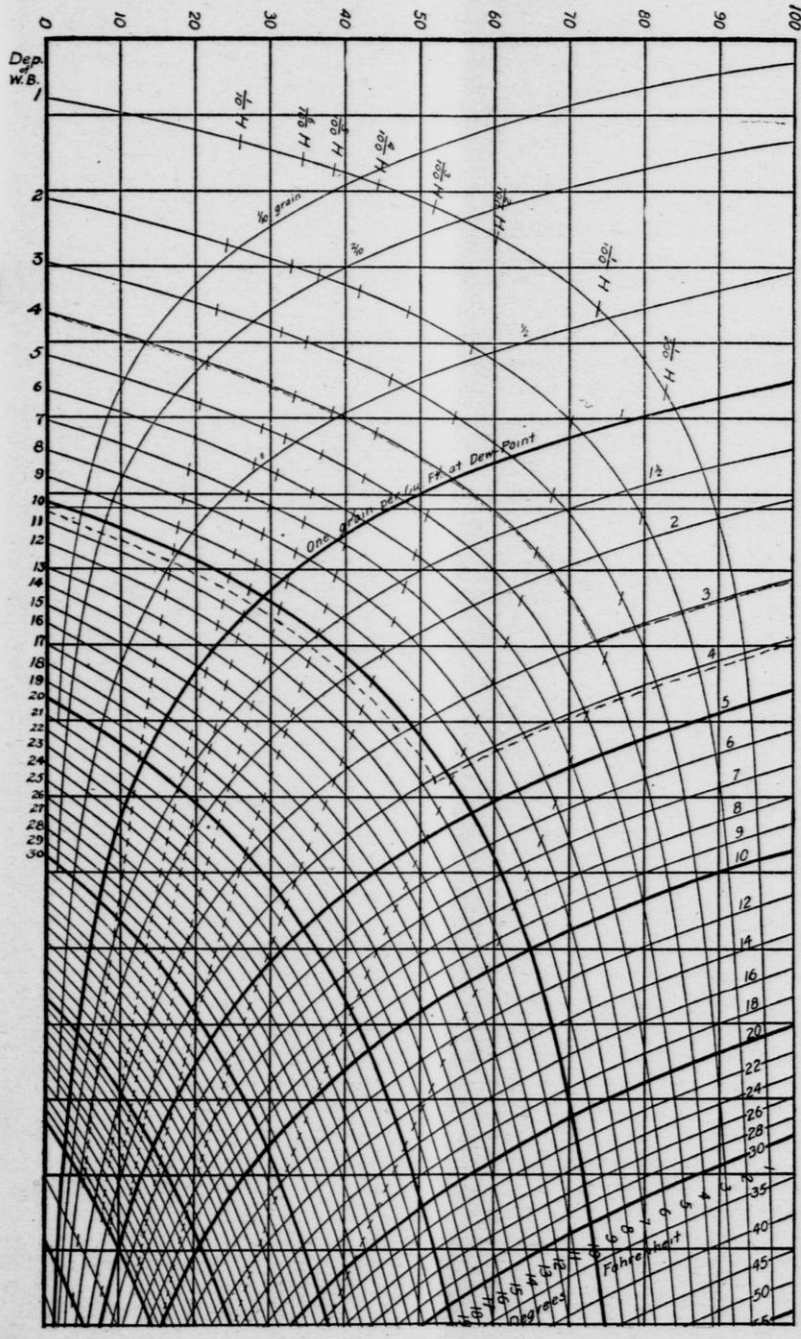
The curves starting at the lower left hand corner and tending up toward the upper right hand corner, represent the dew point temperature and are read at the temperature reading of the dry air ruling on the right side where they end. The diagram contains more data in which the cranberry grower has no interest.

The use of the diagram is best explained by giving one or two sample forecasts, taken from the Experiment Station Records at Cranmoor, when the writer was forecasting for the growers of that locality.

On August 31, 1909, an observation taken at 6:30 P. M. read as follows:—Maximum 62.8 degrees, dry bulb 50 degrees, wet bulb 46 degrees, barometer slightly below normal but rising slowly, atmosphere clear and light northerly winds.

To get the dew point we refer to the diagram. As the difference between the dry and wet bulb readings is 4 degrees we pass down the left side to the fourth curve, follow this down to its intersection with the 50 degree dry air temperature line, then turn to the direction of the curve from the bottom left hand corner and follow it up to the right margin which gives us a dew point reading of 42 degrees.

In this example the low maximum is offset by the barometer being slightly below normal and otherwise conditions being normal, the



Dep. of W. B.=Departure of Wet Bulb
D. B.=Dry Bulb.
D. P.=Dew Point.

constant is used without alteration. With a dew point of 42 degrees the minimum temperature would therefore probably drop 17 degrees, and the forecast for the night would be a minimum temperature of 25 degrees. The minimum actually reached at unsanded beds that night was 24 degrees, on the wild marsh 20 degrees and on a sanded bog 27.3 degrees.

As a second example data secured at 6:20 P. M. on June 9th, 1912, will serve as an illustration of range earlier in the season. The readings were: Maximum 77 degrees, dry bulb 68 degrees and wet bulb 57.5. The barometer was slighty above normal and rising, the atmosphere clear with a slight breeze from the south. To determine the dew point we note that the difference between dry and wet bulb readings is 10.5. We pass down the left side to the space between the 10 and 11th curve, then follow this down to its intersection with the 68 degree dry air line, thence taking the nearest curve bearing up to the upper right which terminates at the margin giving us a dew point reading of 50 degrees. The dotted lines will serve to assist in tracing these readings.

In this second sample forecast, the high maximum and the southerly wind and the fact that the barometer was above normal are conditions which balance each other so that the constant can again be used without alteration. Therefore 17 degrees below the dew point of 50 degrees gives us a forecast of 33 degrees for the night, The actual minimum for the night was on unsanded bog 32.7, wild marsh 30.9 and on a sanded bog 37.6. A little frost was visible on some of the lowest and coldest places.

If the grower would practice this system and make local forecasts for his own situation and supplement the information gathered to the valuable forecasts received from the U. S. Weather Bureau, he would soon very materialy reduce the frost hazards which have in the past taken unwarranted tolls from the cranberry industry.

SUMMARY

1. Continued observation over a number of seasons has shown that the relationship or ratio can be determined between the average drop of the minimum thermometer, registered on the coldest spot on a cranberry bog, three inches above the ground, and that of the dew point determined 40 inches higher and one to one and one-half hours before sunset on the previous evening.

Also that the dew point serves as an important factor in the local forecasting of minimum temperatures on individual cranberry bogs. (The greatest extreme in range observed was 29.5 degrees while the average normal range or drop under normal conditions being 17 degrees.)

2. Frost rarely occurs on nights following days when the maximum registered from 72 degrees to 75 degrees F. in a standard thermometer shelter.

3. For roughly estimating the dew point in the absence of a table or diagram, proceed as follows:—

From the **dry bulb reading plus one** take two times the **difference** between the wet and dry bulb readings, and the resulting number is within one or two degrees of the actual dew point temperature, when the **difference** is less than 4 degrees.

(D. B. plus 1)—(W. B.—D. B.) x 2 equals Dew Point.

Where the difference is between 4 and 12 degrees, add 2 to the dry bulb reading before subtracting.

These rules do not hold good for greater ranges in the wet and dry bulb readings.

4. Whenever the minimum bog temperature reaches 40 degrees by 9 P. M. it is safest to plan to stay on the watch at least until 1 A. M. rather than take the extreme chances, which one would do not noting a decided change for the better in the way of rising or shifting winds, or a heavy clouding over, or preferably a dropping barometric pressure.

5. The use of the anemometer is desirable in connection with the weather vane to show the wind velocity. However the setting up of a toy windmill such as is often set up by boys will help materially in forming an idea of the wind velocity, and thus assist in the local forecast.

6. During the summer seasons it was found that the lowest temperatures reported from Yellowstone Park during a cold wave or "High" was usually two or three degrees higher than the minimum registered at Cranmoor district 48 hours later.

7. The most severe "catchy" frosts have invariably been most commonly accompanied by a northeast wind.

8. A close study of prevailing conditions just before retiring at night is an excellent practice.

In Memoriam

Whereas Divine Providence has seen fit to remove from our membership our honored associate Jerome D. Potter, one of the charter members of this Association and one who always took an active interest, not only in the affairs of the Association, but also in the welfare of his community, be it therefore

RESOLVED: That we as an Association tender to the surviving members of his family and his relatives, our deepest sympathy in their bereavement and hereby express our deep sense of loss not only to them but to us as well; and it is further

RESOLVED: That this resolution be inscribed in the minutes of this meeting and that a copy thereof be sent to the surviving widow and children.

Committee
F. R. BARBER.
A. E. BENNETT.
ALBERT HEDLER.

TOKEN OF APPRECIATION

The Wisconsin Cranberry Growers' Association assembled at Wisconsin Rapids street car pavilion, hereby tenders grateful thanks to Mr. F. J. Wood, Mr. Guy O. Babcock, and the Wood County National Bank for the refreshments so generously furnished and bountifully served at the meeting today, which were so greatly appreciated by all present.

We feel under renewed obligation on account of this added evidence of interest in us, and in our work, which is in line with the former favors from the same source, and greatly enjoyed by all in attendance.

By Committee
F. R. BARBER, Warrens.
J. SEARLS, Wisconsin Rapids.
MRS. P. M. SMITH, Cranmoor.

August 9, 1921

LIST OF MEMBERS WHOSE DUES ARE PAID TO JAN. 1, 1923

Chas. L. Lewis, Jr., Beaver Brook, Wisconsin.
H. R. Laing, Berlin, Wis.
H. H. Gebhardt, Black River Falls, Wisconsin.
H. J. Gebhardt, Black River Falls, Wisconsin.
J. J. Emmerick, Cranmoor, Wisconsin.
T. J. Foley, Cranmoor, Wisconsin.
Edward Kruger, Cranmoor, Wisconsin.
H. H. Kruger, Cranmoor, Wisconsin.
L. N. Rezin, Cranmoor, Wisconsin.
S. N. Whittlesey, Cranmoor, Wisconsin.
Mrs. S. N. Whittlesey, Cranmoor, Wisconsin.
F. E. Kessel, Hawkins, Wisconsin.
Miss Lydia M. Huyck, Minong, Wisconsin.
Regalia & Winter, Mather, Wisconsin.
W. A. Fowler, Mather, Wisconsin.
Geo. P. Bennett, Mather, Wisconsin.
B. R. Mitchell, Mather, Wisconsin.
Daniel Doyle, Mather, Wis.
Chas. Badgley, Mather, Wis.
Eli Grimshaw, Mather, Wis.
E. H. Kruschke, Oshkosh, Wisconsin.
H. F. Whittlesey, Port Edwards, Wisconsin.
K. B. Colton, Spring Brook, Wisconsin.
James C. Bowen, Tomah, Wisconsin.
E. C. Dano, Tomah, Wisconsin.
Mrs. H. S. De Long, Tomah, Wisconsin.
Dr. H. B. Johnson & Son, Tomah, Wisconsin.
Jos. H. Schmidt, Tomah, Wis.
Edward Habelman, Tunnel City, Wisconsin.
Monroe County Farm Co., Valley Junction, Wisconsin.
Wm. O'Connor, Valley Junction, Wisconsin.
O. O. Potter, Valley Junction, Wisconsin.
Henry Kissinger, Valley Junction, Wisconsin.
Mrs. Lucetta Case, Valley Junction, Wisconsin.
Richard Rezin, Valley Junction, Wisconsin.
Geo. Strozewski, Valley Junction, Wisconsin.
A. B. Scott, Valley Junction, Wisconsin.
L. M. Purviance, Valley Junction, Wis.
Alex Grimshaw, Valley Junction, Wis.
F. R. Barber, Warrens, Wisconsin.
Wetherby Cran. Co., Warrens, Wisconsin.
E. P. Arpin, Wisconsin Rapids, Wisconsin.
Guy O. Babcock, Wisconsin Rapids, Wisconsin.
Jos. Bissig, Wisconsin Rapids, Wisconsin.
Geo. M. Hill, Wisconsin Rapids, Wisconsin.
Mrs. R. E. McFarland, Wisconsin Rapids, Wisconsin.
Mrs. A. C. Otto, Wisconsin Rapids, Wisconsin.
M. O. Potter, Wisconsin Rapids, Wisconsin.
Jacob Searls, Wisconsin Rapids, Wisconsin.
F. J. Wood, Wisconsin Rapids, Wisconsin.
Guy Nash, Wisconsin Rapids, Wisconsin.
Miss Anna M. Bamberg, Wisconsin Rapids, Wisconsin.
A. E. Bennett, Route 3, Wisconsin Rapids, Wisconsin.
Carl Getzinger, Route 3, Wisconsin Rapids, Wisconsin.
Mrs. James Gaynor, Route 3, Wisconsin Rapids, Wisconsin.
Thos. McGovern, Route 3, Wisconsin Rapids, Wisconsin.
Mrs. P. M. Smith, Route 3, Wisconsin Rapids, Wisconsin.
Andrew Searls, Route 3, Wisconsin Rapids, Wisconsin.
Roy M. Potter, Route 3, Wisconsin Rapids, Wisconsin.
Andrew Bissig, Chicago, Illinois.

Henry J. Thayer, Boston, Mass.
Dr. O. A. Reschke, Duluth, Minn.
Cran. Lake Development Co., Minneapolis, Minn.
Lory Lake Cran. Co., Minneapolis, Minn.
Guy N. Potter, Grygla, Minn.
J. H. Hancock, Marcell, Minn.
A. U. Chaney, New York City, New York.
Friend Manfg. Co., Gasport, New York.
R. C. Brown, Riverhead, New York.
Jos. J. White, New Lisbon, New Jersey.
Miss K. C. Rockwood, Princeton, New Jersey.
Henry S. Gane, Santa Barbara, Calif.

LIFE AND AUXILIARY MEMBERS

Lucian J. Fosdick, Boston, Mass.
Henry J. Thayer, Boston Mass.
Chas. H. Pitman, Brown's Mills, New Jersey.
Cranmoor Cran. Co., Cranmoor, Wisconsin.
Judd M. Wait, Embarrass, Wisconsin.
C. R. Treat, Wyeville, Wisconsin.
Arpin Cran. Co., Wisconsin Rapids, Wisconsin.
Armour & Co., Chicago, Illinois.
W. B. Chaflin & Co., Hopkinson, Mass.
R. A. Everson, South Hanson, Mass.
Emulus Small, Harwichport, Mass.
Bennett & Hill, South Hanover, Mass.
Peycke Bros. Cran. Co., Kansas City, Missouri.
Ginocchio-Jones Fruit Co., Kansas City, Missouri.
A. E. Freeman, Island Heights, New Jersey.

WISCONSIN STATE CRANBERRY GROWERS' ASSOCIATION

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

January 1921, report, now ready for distribution, will be sent to all entitled to same on application to Mrs. S. N. Whittlesey, Secretary, Cranmoor, Wisconsin.

ASSOCIATION OFFICERS

President, C. L. Lewis, Jr., Beaver Brook, Wis.
Vice President, Capt. Guy Nash, Wisconsin Rapids, Wis.
Secretary, Mrs. S. N. Whittlesey, Cranmoor, Wis.
Member of the Executive Committee, M. O. Potter, Wisconsin Rapids, Wis.