SEASONABLE SUMMARY OF OPERATIONS
AT THE CRANBERRY STATION

O. G. MALDE.

The actual opening of the Cranberry Station, that is the dropping of the winter flood, was done April 26, which was much later than has been our former practice. This, however, was due chiefly to the fact that we were this year able to hold the winter flood as long as we desired, owing to the fact that the Gaynor Cranberry Company had made certain improvements in their adjoining main ditches so that our winter flood did not get away by seepage as rapidly as it had in former years and we were able to maintain the small supply of water continually running onto the station.

On April 27th our data shows that in the majority of cases the cranberry vines were approximately eighteen days in advance of the normal season, which is partially due to the fact just mentioned. However, on about the 20th of May, it was found that the cranberry vine development was from three days to a week later than normally, showing that the cold weather during the greater part of May had practically kept the cranberry development at a standstill, and for that reason also it appears that the general insect pests affecting the cranberry were somewhat slow in coming out, or emerging.

The early start of the cranberry vine on many of the bogs necessitated a greater amount of frost protection during the first half of May than is usually required and we find that during the period of April 29th and June 15th frosts or low temperatures very near the freezing point occurred one-third of the time. This naturally meant the use of a great amount of water for the protection of the cranberry vines, and the use of this large quantity of water also undoubtedly served as a great controlling factor in the emergence of insect pests. Had not the month of May, besides being unusually cold, also been abnormally wet, the cranberry industry of the state no doubt would have suffered great frost damages, owing to the scarcity of water due to such continuous use as the season required, but with the rainy conditions prevailing, practically all water supplies kept normal and there proved to
no need of very great economy in the use of water which in itself is a
great controlling factor in the protection of the cranberry crop of the state
during the first six weeks of the growing season. The coolness of the sea-
son after the last few days of April seemed to prolong the emergence period
of the insects, such as the black-head vine worm which did some work dur-
ing April and the millers first emerged May 11th, but millers were found
flying as late as June 22nd, which is an unusually long period for the pres-
ence of the miller of the first brood of this insect. However, the black-
head did not appear very abundant in any district, and comparatively little
damage has been done by it. The tip worm was first found at work June
6th and later observations indicated that the second brood of these had just
finished their work the first week in August when it was also found that be-
sides being somewhat plentiful in the Cranmoor district, these tip worms
were also found this year to be present to some extent in the Mather dis-
trict where it has previously been practically unknown. On June 7, a few
specimens of the oblique banded leaf roller were found at work on experi-
mental station bog, and on one other bog, but they have not been found
plentiful at any point this season and a few specimens observed were rather
rare as this insect has not been noticed for the past few seasons and the
largest infestation of any areas by this insect was reported by Mr. Harden-
berg in the summer of 1909.

The cranberry fruit worm millers were first observed July 3rd, which
is nearly a month later than some of our earlier records and in fact is un-
usually late for the emergence of this insect; June 8th being one of our
earliest records. It is very noticeable in the case of the fruit worm that
where the emergence is very late the per cent of damage done by this insect
is very greatly reduced, due to the fact that in most cases the fruit has at-
tained a fair amount of growth before being attacked by the insect, which,
when it emerges early, often attacks the young berry at the time the petals
drop and in such cases the small worm in a comparatively short time de-
stroys five or six of these small berries, where it only works on one half-
grown berry, when it makes its first entry into this larger one.

Later on in the fall, or rather about September 15th at our harvest
time, we found many fruit worms yet active in the berry and in ungraded
materials shipped from a Mather bog to Milwaukee to exhibit at the State
Fair. This fruit worm was very noticeable in some lot shipments of fruit
that had not been milled before shipping. This is the latest we have ever
observed the fruit worm working in cranberries since our work commenced
at the Cranberry Station, although we have heard of there being one or two
seasons in the eighties when this insect was found working in fruit in the
warehouses after harvest, case which is frequently reported from Cape Cod,
owing to their early harvest of their earliest varieties of berries. Owing
to the lateness of the emergence of the fruit worm this season, due to un-
favorable weather conditions at times when we plan spraying, the matter
of general spraying operations were not taken up. This has proven entirely satisfactory owing to additional data secured by the activities of the insect during the season in their sluggishness or apparently slow development and greatly extended period of activity.

The past season the Department of Agriculture at Washington, D. C., has sent out reports of the use of fertilizers for stimulating cranberry vines to overcome or outgrow injuries sustained from the attack by the so-called cranberry root worm, which insects have not been observed in Wisconsin as yet, and no injured vines have been found that would indicate an attack such as is made by the cranberry root worm.

We are glad that this so-called cranberry root worm has not yet appeared in Wisconsin, or at least has not as yet attacked cranberry vines. We may expect that at most any time the insect will appear if it has any special liking for the cranberry plant, for, as in the case of diseases, "it is very evident that where any crop is grown extensively, the insect pests and diseases partial to it, will invariably sooner or later make their appearance and attack the plantation to a greater or less degree." The earliest cranberry blossoms found this season were on June 8th on the Prolific. This, of course, does not take into account the blossoming of the moss berry, which undoubtedly blossomed ten days to two weeks earlier.

Only a small area has been planted on the Cranberry Station the past season. This area, one-tenth of an acre, was planted to selected Metallic Bell from one of our largest nursery plots and the planting was done June 26th on three inches of sand, and in hills six by eight inches apart, a small part of this was planted as a special test, and on this area a few hills were planted with only upright striped from the runners and a few other hills planted from only runners, also vines cut in lengths one inch, two inches and three inches were also planted by sowing broadcast and applying the sand above cuttings at various depths ranging from one-half to one and one-half inches. The test being to find out to what depths vines can be planted, and still have the uprights come through the sand. It is quite evident from earlier observations that new growth will at least go through one-half inch of sand where vines are covered. The question remains, however, will such growth come up through the greater depth of sand than the one-half inch? Vines with a few small roots attached, and planted in rows by themselves, showed apparently more vigor than the vine which is ordinarily planted. The layering test failing, we will in the spring repeat our experiment of planting short vines at varying depths under the sand and plant such vines very early in the season so as to get the benefit of the early spring growth and hope to get more definite data than was rendered by this experiment during the past season.

The presence of fungous diseases on the cranberry marshes this year seems to be very rare, apparently owing to the coolness of the season. However, the False Blossom malady has shown up quite extensively in various
places. On the Grand Marsh north of Mather, we found on August 7th, a most interesting case of "False Blossom" in various stages of growth and all under a similar condition of culture that seems to give a strong key to the solution of the "False Blossom" problem. The case in question was a large section of Berlin vines planted about four years ago, part of the area having been treated with ground rock phosphate at a rate of about one ton to one and one-half ton to the acre, while other parts of the area had received no treatment and two years after planting the whole area had received a light coating of sand, probably about one-third to one-half inch deep. The demarcation is very plain where the rock phosphate treated area ends and the untreated area begins, and owing to the fact that the entire area is planted to one variety of vine, the appearance of a very luxuriant growth on the rock phosphate treated area with also a comparatively heavy crop of fruit and a very small percentage of False Blossom present were contrasted with a rather meager growth of vine with a rather small crop and the presence of at least 40% of False Blossom would seem to very strongly support our former conclusion that "this False Blossom malady is not a pathological one but purely physiological, and can be remedied by cultural methods which will invigorate the vine."

On this area, at harvest time, samples of fruit were sent me from the two different treated areas and while, as I stated above, these were one variety planted at one time and sanded two years later, the picking from one square rod of the rock phosphate treated area yielded 56 quarts of berries, while one square rod from the untreated area yielded only 8 quarts, and the difference in the berries was very noticeable as to the size. The sample from the rock phosphate treated area, counted an average of 85 berries to the half pint, or 340 berries to the quart, while the sample from the untreated area counted 192 berries to the half pint or 738 berries to the quart, crop run. It will be noticed here that it is more the matter of the difference in size of fruit than in the number of fruit which shows the actual difference in the yield and which size, unquestionably is due to the fertilizer application. The untreated area yield by measure was 14 per cent while by count 57 per cent of that of the yield from the fertilized area.

As it appears that the main factor promoting this False Blossom is due to a weakened condition of the vine which apparently can be caused by either of two extremes; the extremely wet condition or the extremely dry condition, together with lack of certain desirable fertilizer elements tending to cause the most vigorous growth of vines. The foregoing, it would seem, has given us a clue to some systematic way of treating this False Blossom problem without complete eradication of the vines, which appear to be affected, and owing to the fact that our Berlin varieties on the experiment station have the past two years shown a strong tendency to develop into the False Blossom state, we now plan to test extensively various fertilizer applications together with the resanding of the bog. Resanding is also very nec-
essary on these old vines as we find that where we have resanded areas where
some changes have been made in the sections the vines adjoining the sanded
areas are appearing very thrifty, while those in the larger part of the sec-
tions are still showing a puny invigorated condition due to the need of re-
sanding and severe frost injuries in the winters of 1912-1913. and 1913-1914.

We have planted fertilizer experiments for the coming season for the
purpose of testing Raw Rock Phosphate, Acid Phosphate, Nitrid of Soda, Pot-
ash and some so-called "Complete Fertilizers," singly and in combination, on
various areas of the Cranberry Station where False Blossoms are found. in
order to secure more complete data as to the fertilizer value in a general way
and in connection with assisting the vines in overcoming the False Blossom
malady. We hope to get some very interesting results from these planned
experiments as a crop yield and vigor of vines should be materially increased
the second season.

The cranberry industry of the state has been quite fortunate in having
the water supply during the month of May keep abnormally large, thus pro-
moting the free use of water, which has resulted in saving the crop of the
state, which present indications tend to show has been somewhat larger than
last year. The total crop will probably be between thirty-three and thirty-
five thousand barrels. There appears to be considerable amount of blight
showing up in different places; but this, however, did not appear to be gen-
eral or cut the general crop to any extent. Indications were that there was
a little heavier blight on the late setting of fruit than there appears to have
been on early setting. The general crop was probably not as heavy as would
have been the case with all early bloom.

The movement for the construction of new bogs for the season were
rather limited, there being comparatively very little new work done, except
twenty acres of new planting at Phillips, Wisconsin, which was all planted
on sand, according to clean culture methods. The Cranberry Station crop for
the season was 33 barrels, and the majority of this was secured from our
youngest or four-year-old planting (the planting of 1911) which areas yield-
ed on the average of thirty to forty barrels per acre, while the older vines
still had the effect of winter damage from the two previous seasons, yielded
rather low as a whole, the vines on the Cranberry Station for the cranberry
season did very well, especially so, the new planting.

Some tests were made in the construction of bulk heads with a view of
testing the comparative costs, efficiency and durability of same. A large
flume was constructed across which our roadway runs, and will hold our
winter flood. This was built on the regular demountable culvert form with
a detachable knockdown form for casting of head. This flume was 24 feet
long with an opening of three feet, the top of the flume being arched, and the
whole flume set upon the floor of two-inch tamarack lumber, four feet wide.
This floor being always under water, it is assumed that the floor will be prac-
tically non-rotting and perpetual. We also put a cement head upon a twen-
ty-four inch glazed sewer tile as a bulk head and in two cases we put cement heads on eighteen inch glazed sewer tiling, and we also put a cement head upon a wooden flume 13x24 inches in order to test its efficiency in connection with this cement head, whereas jaws built of lumber frequently have to be replaced on account of rotting. All the cement construction was installed with a cement base twelve to eighteen inches deep and eighteen inches wide, and the full length of the width of the head of bulk head and set below the bottom of the bulk head floor. The base was constructed and allowed to set one day before setting on forms for main head.

Demountable forms of two sizes were used in casting the head parts of the bulkheads.

The approximate comparative costs of cement and lumber bulkheads are about the same where tamarack planks are used for the body or flume part and oak for the head part. Cement one part and sand three parts were used in our work, sand being from home pit. No rock was used owing to need of long hauling to secure it. Woven wire fencing was used for reinforcement in all construction.

Owing to severely frosty nights in November and early December, concrete construction on the marshes should be done during the warm part of the season.