splendid Howe vines to Wisconsin. I got one car, and Guy Potter got several. The Howe appears to be a most aggressive vine.

Those Eastern men that we met at the Exchange meeting are cordial, courteous Cranberry Kings, worthy of our admiration.

Mrs. Whittlesey and I did Washington D. C. on our way home, and here we are.

THE VALUE OF SAND

By Andrew Searles

The first step taken in sanding cranberry bogs was by Mr. Ralph Smith, father of our present secretary, about thirty-five years ago. He had a small field, only about six acres under cultivation at that time. That was the first field that had ever been surfaced and planted on the clean bog. Mr. Smith also showed me a small field of only a few square rods of the most beautiful cranberries I had ever seen, beyond any conception of what a cranberry bog should look like.

I resolved that if the time ever came when I could, I should possess a similar cranberry bog. It was perfectly evident that that was the only rational, sensible method to pursue in the growing of cranberries in Wisconsin. When I got home, I broke that same subject to my brother. What a wonderful piece of cranberry bog that was! But we were under the pursuit, at that time, of a thousand acres of cranberries, and, as my brother said, we couldn't possibly sand one thousand acres, or any part of one thousand acres. None of it was suitable. It was the natural bog, ditched and fitted up as we at that time supposed was the thing to do, without any surfacing, trusting to luck, and believing that we could do what the people had done at Berlin.

The next step I saw taken in the cranberry sanding process was attempted by Mr. A. E. Bennett. He had several acres surfaced, and he decided to try the experiment. During the wintertime Mr. Bennett drew sand upon this ground, and put on this sand in strips across his field about a rod in width, and, as I remember now, about six inches in depth. He sanded a strip, skipped a strip, and sanded again. At that time it was usually the habit of cranberry men to hold the water well up to the surface. You can imagine what this did to the sand experiment strip. Vines refused to flourish, and we all stood back and looked on and shook our heads. We didn't know just what was the matter. Maybe Mr. Smith's experiment was wrong. Still we were undecided.

Later, John A. Gaynor obtained a small appropriation from the state for experimental purposes. Three experimental stations were started, which later were consolidated into one. They didn't appear to be getting anywhere with three stations scattered out, each man

using his own ideas of what should be done, so we consolidated into one, and acquired a lease of five acres at the Gaynor Brothers' for two years. My remembrance of the Smith bog returned to me with force. I decided to plant some cranberries on sandy ground. I surfaced one acre of ground, and sanded it with about two inches of sand, and planted it. I adopted at that time the same method of planting I have followed since, of planting in rows about seven or eight inches apart, and keeping it clean. It required about $6.00 to keep this acre of ground perfectly clean. But the next winter they were flooded with water, and the spring following water backed in on the field and didn't have sufficient outlet to carry out accumulated water, and pulled out our vines.

During this time we made some experiments at the experiment station to get a supply of water for the ground. We made an effort to get Artesian water. I got a drill machine, installed it in the town of Cranmoor, and undertook to investigate for water. I struck granite at the depth of thirty-two feet. The first effort was made almost directly east of the Bennett home. The machinery was then removed to the experimental station, and again tried. Again we struck granite. There wasn't much difference in the depth from the experiment on the first. We decided that there was no possibility of our getting relief from that source. But in these investigations I discovered that there was a big bed of good sand lying all over these marshes; and I say here that that is one of the crying needs of the Wisconsin Valley District: sand. A supply of sand is available to the cranberry grower.

The grower has begun to learn the uses of sand, but when he looks around there is no sand within possible reach, or within reasonable reach of very few of the marshes. The higher portions of the land, a great portion of it anyway, is shell rock, unavailable for cranberry purposes, of course, but this supply of something like thirty feet of good sand is in easy reach of most of you.

The only change necessary in the dredging machines, is a clam shell dipper. You can go out near the fields under cultivation during the winter when the ground is frozen. Blow a hole with dynamite through the frozen ground, drop down your clam shell dipper, and take your sand. You have abundant sand of the best quality for building up bogs. The coarsest sand is at the bottom. The surface is covered with fine grained sand. This sand you may think is full of water, and when emptied into the sleigh would freeze and clog up your sleigh with ice. This is not true. Some years ago I had charge of Cranberry Lakes evelopment Company near Phillips, and we used a similar dredge to load our sleigh. We took sand out of the water. Sand drains quickly, and we loaded that sand directly on the sleigh. There was no ill effect. That sand is warm when it comes out of the water. It was drawn directly to the bog, and spread for resanding cranberry bogs.

In the town of Cranmoor, or in a like situation, I would empty my dipper of sand upon the ground while in the absence of teams, and when the team came I would pick it up and deposit it on the sleigh. This may be done very quickly and easily.

I think this is all that needs to be said here to-day on the subject. I hope that the people will take advantage of this source of sand.

COMMENT BY MR. ANDREW BISSIG

I am like the rest of the growers. We have berries from a pinhead to half grown. With the exception of about ten acres, I wouldn't give much for the crop. Those ten acres are pretty well advanced. The acres that we have sanded a few years ago are the best berries, and the largest.

We came to realize that sand is what the berries want. It is our first experience in sanding, and is a decided success. Last winter we sanded ten more acres, and the vines are beauties there. Mr. Wood was astonished how sanded vines developed, and they are all budding heavily. We have a pretty fair crop, and half grown. On the old bog, not sanded, we have a heavy bloom for at least 1500 barrels of berries, but maybe about 25% will go through, and that's all. We cut the crop down to half of what we expected, and are satisfied if we get that.

Sanding is the only thing to do in this state, and we find that what Mr. Searles said is true. We should have done it years ago. We lost thousands of dollars by not doing it, but everybody told us that our sand was too fine.

We don't sand any planting until it gets about three years old. We have our new crop well along, all about a uniform size. Nearly every vine is budding for next year, and we expect a big crop next year, which will be the third year. After that, we will sprinkle a little sand, about one-half inch; on old vines, about twenty-five years old, about three inches. The roots need something to weigh them down. Our vines are too long, and up too high.

In order to get rid of fire worm, we make it a point to flood every year. This year we are practically clean of fire worms. My brother is an expert at this, and usually does it while I am away. This year he flooded our marsh the last of May or the first of June, and kept the vines under water for about forty-eight hours. We couldn't find any fire worms except on one little corner where it is high. I showed that piece, about half the size of this hall, to Mr. Wood, and it is the only place we have them. Next year we are going to tramp them down and mow them off. We have a few fruit worms, but not many. This goes to show that if you don't flood for fire worm you will have them every year, and they will destroy your berries. I don't know when they flood here. Some flood late. It is too late when they are nearly full grown. You have to take them when they are small, and

when the first worm is about one-fourth inch long. Then you can kill them easily. I haven't seen one vine hurt by fire worm except that one spot.

I hope the Wisconsin growers will have a good crop, so as to keep up our reputation among our good customers. In Chicago we have a lot of customers of Wisconsin berries. They like our berries. Sometimes we get a premium of $1.00 a box over other berries, because they are so uniform in size and color. We haven't many, and can't establish a market for them until we get enough. A few boxes don't count. A high-class customer with a high-class trade will get them, and he pays the premium.

PLANNING FOR STATE-WIDE CRANBERRY INSECT CONTROL

By S. B. Fracker, *State Entomologist*

An entomologist is sometimes known as an alarmist because it is his business to discover dangers before they arrive and point out measures which should be taken in advance. He is not always able to do this and sometimes insect pests and plant diseases prove to be less injurious than was anticipated. In many cases, however, the alarm proves to be more than justified and new introductions often result in far greater injury than was expected.

In talking to the Wisconsin Cranberry Growers' Association, however, it is not necessary to take the attitude of an alarmist. From sad experience you are familiar with the damage which can result from insects feeding on the vines or on the fruit, or from diseases causing faliure to set fruit, or cranberries rotting in storage. No two years have shown just the same record but in some seasons the damage from this source has been the most important factor in determining the total crop.

The ideal conditions for insect and plant disease control, in the case of any farm or garden product is to have the same insects and diseases to cope with each season and to discover some method by which they can always be prevented from developing. When such a condition exists it is not necessary for the grower to determine each season just what is most likely to give him trouble or anticipate just when it is going to occur. In the case of apples, for example, a spraying program has been developed which, if carefully applied, will result in freedom from fruit worms and apple scab, and this spraying program is used by commercial orchardists year after year regardless of the varying outlook as one season follows another.

Unfortunately, the measures which have been developed to protect cranberries against losses from pests are not of this nature. The sources of trouble vary from season to season and protective meas-