and protection against insects and frost; it also has a fertilizing effect, the streams flowing through the swamp land collect particles of vegetable matter which supplies the marsh. It is a safe rule to raise the water for flooding in fall when the temperature becomes sufficiently low to stop vegetation, say 63 degrees. The dams required for holding the water for winter flooding should be built thus:

You can use a theodolite, or spirit level and two boards and go to the lowest spot along the line; then put on boards perpendicular eighteen inches apart, rest level on the top of them and point it to the highest part you intend covering with water and bring it to a level; then erect a pole and move a stick with a white rag up or down as you give directions; sight along top of the spirit level and judge the level with your eye, mark difference in the height of the two positions by subtracting the height of the mark on the pole from the height of spirit level above the surface of the ground. Build your dams as thick as the depth of water will be; if a head of five feet be required dig the ditch five feet through the muck, throw out muck and fill with sand, place turf on each side of the sand, make the dam a foot or so higher than required to allow for settling. The dam should be built on a slant projecting at the bottom and so that the water should be at a level at both ends.

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CHAPTER V.

GENERAL MANAGEMENT OF MARSH AND SANDING.

On this subject there is a great diversity of opinion, and right here should it be stated, that no two marshes are alike, or can be managed the same; or can a perfectly improved one be handled as one partly improved, or one in its wild condition. With farms the lay of
the land, soil, water privilege etc., control to a great extent the management and ruling.

A wild marsh partly improved with ditches and dams can be handled to a greater advantage by having a reservoir-pond, it will increase the size of the berry and also the number as the water at times through the summer can be held off the marsh or used through the marsh at other times, letting it drip through marsh from pond which keeps it cool at a time when the millers or worms work. Fill the ditches to the surface, which cools the atmosphere and keeps the miller from laying its eggs and they will seek a warmer place. It will also impede the working of any worms that may be hatched out.

I could advise for a newly planted marsh to give growth of vines that it be kept very dry through drainage for about two to three years. I visited frequently, for observation, the Gaynor marsh for the last two years, and this summer saw vines only set two years ago from choppings covering the bog all over and bearing some berries of immense size. I was informed that they had tried to dry it more, than they had been able, as there was considerable per cent. of water in the bog all the summer; although they had as thorough drainage as I ever saw. I observed runners on their marsh two and a half feet long. The vines are well budded for a crop this year. I am of the opinion that it will yield twice the berries per rod of the wild marshes, as the size of the berry will greatly increase the quantity and the extra price they will get for the size of the berry will assist in remuneration.

I have read that it is not advisable to flood a new meadow. I claim it is and give my reasons; firstly, it protects the soil and prevents its heaving with frost which would expose the roots of the vines; it allows the soil to pack around the roots and supplies the marsh with decomposed vegetable deposit as well as giving the young vines an even temperature when under water in winter which they cannot get
when exposed to the blast of winter and changing temperature out of the water, sometimes covered with snow, at other times uncovered, and early in the spring the young tender buds that have been covered most of the winter become exposed and in their tender condition it takes but little frost or severe cold winds to destroy them. The most harm is done to vines and buds in the spring by frost. Another fault of growers are that they do not put their vines sufficiently under water. I have repeatedly seen the tops of vines sticking out of the ice when flooded when the water they have let run to waste could have covered them. The spring preservation is the most important.

After the vines get a years growth, I would advise pulling the grass and weeds by hand, one pulling well done by men will suffice if done when the grass and weeds are young. Instruct your pullers to pull sideways as if pulled straight will disturb and tear the new runners off the vines.

I can not speak with experience of sanding a meadow as I don’t know of any in the West that has developed sufficiently to give proofs of success. In the East they use the white sand from the Beach. We can use only sand that will crumble in the hand when compressed. If it adheres, or if it contains any per cent. of white clay, I should not advise its use. Sand also prevents the cracking open of the flakey muck which do not retain moisture nor absorb it from below in dry times. Therefore in this case sand would help in time of drought and be a great saving to vines. Mr. Bennett, one of our leading Cranberry Growers, has many acres sanded. I give quotations from him:

"We have planted a piece of marsh after this method. That is strewed vines that have roots on, containing seven acres sanded two inches deep that have been planted two years last spring which produced a crop last fall of over fifty bushels of nice large berries to the acre or 350 bushels on the piece. They were the largest berries we had."
Mr. Smith and Mr. Gaynor also have some sanded marsh that will soon prove how beneficial it may be. It is doing well up to date."

If you sand I would advise for a new marsh before planting three or four inches. After planting two inches in putting on sand you must be controlled by quantity of muck and character of bottom; the most sand being required on the deepest muck as it will settle down and distribute until very little is left on the surface. Too much sand on a planted meadow has a tendency to crowd the roots and impede the growth of the vines. Sanding can be done advantageously in the winter months. Lay a portable train-track from your islands or main land or haul on the ice, have dump boxes on car, and after dumped spread on the ice evenly; when it thaws in spring it will fall to the meadow; keep a good supply of water in the pond from spring through the summer and in case of insects, you can use it as well in fall for frost. I would here relate that the mischief done by fall and spring frosts are eradicated by irrigation; many marshes, I could here mention, not having lost any of their crops for two years or more, although picking lasted quite late and through many frosts before the berries were taken off the marshes. This water application to keep off frost enables the grower to give his berries a chance of growth and an increase of crop of forty-two per cent of the early picked ones.

Have your marsh arranged in sections, one acre or less each so that you can run water on or off at will in a few hours and secure your crop, also have many open cross ditches of two feet. The water being in motion is a great preventative to frost; the open ditches every fifteen rods are excellent for drainage.