



BEST MANAGEMENT PRACTICES GUIDE FOR MASSACHUSETTS CRANBERRY PRODUCTION

Renovating Producing Cranberry Acreage

Over the course of time, conditions may arise on the bog (e.g., weed infestations, invasion by nonproductive mongrel vines, etc.) that may become severe enough to necessitate renovation of the bog. Renovation is a costly procedure in both time and money. Thoroughly consider the implementation of all other available remedial activities before initiating renovation of the bog. If positive outcomes are not obtained within a reasonable time frame, then consider renovation.

Recommended Practices

◆ **Take the opportunity to improve water management when renovating a bog.**

If the entire system is to be upgraded, consider modifying irrigation pipe lateral spacing to 40' x 50'. Closer lateral spacing requires more sprinkler heads per acre, but water use efficiency improves since less water may be needed to achieve proper uniformity. Research has shown that high uniformity nozzles and 18" risers on existing systems with wider spacing can improve irrigation uniformity. For best performance, risers should extend above the vines and should be secured (staked) to a 90° angle to the bog. System modifications may affect wetted diameter. For example, use of riser heights of less than 30" will significantly reduce wetted diameter from that reported in irrigation manufacturers' design manuals.

Make modifications that minimize rinse time as many existing and new pest control products work most effectively when applied with short rinse

times. Installation of multiple satellite injection ports will facilitate effective pesticide application. Refer to the Chemigation BMP for more details.

If the bog is severely out of grade, consider subdividing the bog by adding interior dikes. This practice will make the individual sections more uniform (less out of grade) and flooding depth can be reduced. Utilize available technologies, such as ground penetrating radar (GPR), to properly site ditches in stable areas on the farm.

It is recommended to consult with an irrigation specialist to determine the most appropriate design (spacing) for your system. Consider consulting with the USDA Natural Resources Conservation Service (NRCS) for dike suitability assessments if needed.

◆ **Conserve and re-use organic material removed from the bog during renovation.**

Organic debris, including material scalped from the bog surface during renovation, can be screened and re-used as organic liners on new bogs. Depending on the organic matter content of the debris, this material may need to be supplemented with additional organic matter. Before re-using organic material, decide if any weed, disease, or insect concerns associated with that organic material outweighs its utility as lining material.

If you are stockpiling sand or organic material, refer to the Erosion and Sediment BMP for information on managing these resources.

- ◆ **When spot-renovating or filling in bare spots, choose your plant material carefully.**

Cuttings require significant amounts of water during establishment. If you plant cuttings in a bare spot surrounded by established vines, you may have to over water the established plants to insure survival of the cuttings. If this is the case, consider planting rooted cuttings instead. If the area to be planted is along a ditch edge, it may be possible to protect cuttings by raising the water level in the ditch. You may be able to install shut-off valves between old and new plantings. It may also be possible to water ditch-edge cuttings with a portable pump and temporary sprinklers drawing water from the ditch.

HORTICULTURAL RECOMMENDATIONS

- ◆ **Use coarse sand for the uppermost layer of the cranberry bog.**

The root zone should consist of about 6 inches of coarse sand (approximately 70% of the sand should fall within the 0.5-2 mm particle size range) to insure adequate drainage and aeration. When selecting a location, on-site availability of such sand is desirable. This sand layer should not be compacted prior to planting.

- ◆ **Bog sections should be as level as possible to facilitate drainage and allow flooding with a minimal volume of water. Laser leveling to 6 inches within a diked section is recommended.**

On a level bog, flooding will be achieved with a lower volume (and height) of water. The height of flood water applied to the bog influences retention of nutrients and pesticides. Mineral soil bogs may be more prone to leaching; limiting flood depth will minimize nutrient and pesticide losses. In all cranberry bogs, nutrients may be forced below the level of the root zone (beyond the reach of the plants). If water must be pumped onto and/or off the bog, lower volume floods will have lower energy costs.

Even on a 'level' bog, a crown of several inches facilitates movement of water away from the center. In lieu of a crown, additional drainage should be placed in the center to promote good soil aeration and minimize disease development.

- ◆ **Obtain vines from a known reputable source.**

It is highly recommended to visit the bog from which the vines will be pruned. However, if that is not possible, buy from a reputable grower or handler. If able to make a site visit, assess the uniformity of the cultivar and the relevant histories of infestations of diseases, insects, and weeds. Obtain production records whenever possible. Find out the date that the vines were cut and how they have been stored. All of these factors will affect how well the vines will establish on your bog.

If you are unable to make a site visit, be sure to ask questions about production and fertilizer histories and request records from the seller. Inquire about any particular pest management problems associated with the source bog.

If using your own vines, cut the vines as close to the date of planting as possible. Growers report better rooting from vines that have been recently cut. Keep in mind that you will lose two years' worth of berries when mowing to harvest vines.

Some cultivar identities can be verified by DNA fingerprinting. The Blueberry and Cranberry Research Center, Rutgers University (609-726-1590), provides this service for a fee.

- ◆ **If vines cannot be planted immediately, store them appropriately.**

If the volume of vines is small, they can be stored in the water in the ditches. Larger volumes of vines can be stored in reservoirs or holding ponds. They may be stored this way for 5-6 weeks, providing they are rotated periodically to aerate the vines.

Vines can also be transported in tight bales. Upon arrival, the bales should be loosened and kept moist, and periodically turned.

◆ **Check vines for viability prior to planting.**

This is especially important if the vines have been stored for a while. Snap several uprights and runners to verify that the tissues are still alive. If the vines are in a pile, it is not unusual for exposed vines to be less viable (dried out). When testing for viability, collect vines from the interior portion of the pile.

◆ **Consider planting varieties that show resistance to fruit rot.**

Several varieties that have shown good field rot resistance in experimental plots include: Black Veil, Foxboro Howes, Howes, Matthews, Shaw's Success, Stevens, and Wilcox.

◆ **If possible, plant cuttings at high density (1.5 tons/acre or more) to insure rapid growth to cover the soil surface.**

Rapid 'vining in' will lead to less competition from weeds, reducing the need for hand weeding and herbicide use during establishment. An additional benefit will be reduced irrigation needs, as loss of water to evaporation from the sand surface will be minimized.

◆ **Weed control during stand establishment is essential for rapid transition to production.**

Surface vegetation should be removed from the site, including roots of problem weed species. Soil fumigants may be used prior to planting to kill weed seeds and roots. *These materials should be used with caution*, see the Weed Management BMP for further information. Make sure that the soil surface is as weed-free as possible prior to planting. After stand establishment, encroaching weeds may be hand removed, mowed, or clipped prior to seed production and dispersal, or spot-treated with postemergence herbicides. Broadcast, pre-emergence herbicides (except Devrinol) should be avoided during the first two years as they may retard stand establishment.

◆ **Poor water management is probably the leading cause of sparse vine growth in new bogs.**

Provide adequate irrigation during stand establishment, but do not over water. During the first two to four weeks, as roots are being formed, use frequent but short irrigation periods. Soil should be moist, but not saturated. Manage irrigation schedules such that puddles are minimized. Using shut-off valves on risers where puddling occurs may also be helpful. After the plants are rooted, less frequent but longer irrigation periods (up to four hours) are preferred to encourage deeper rooting.

Frequently check soil moisture to make sure the vines do not lack for water (refer to Irrigation BMP). This is particularly crucial if the weather is warm and sunny right after planting.

◆ **Pest management activities should be conducted on a new planting.**

Scout bogs for signs of incoming insect, disease and weed infestations. As vines start to fill in, you can use a sweep net to monitor insect populations as on an established planting. Removing weeds before or as they become established (making room for the vines to fill in) will minimize many future weed problems.

◆ **Apply light layers (about 1/2 inch) of sand to the new planting at the end of each of the first two seasons.**

Light sanding will serve to anchor runners and promote the production of upright stems. Sanding on ice is currently the industry standard, however, new methods are constantly being developed. Sand may be applied by hand when small areas need an application. Refer to the Sanding BMP.

Exercise caution when using machinery on new plantings to apply sand. Ensure that the bed is stable and able to handle the machinery. Improper use of machines may cause rutting and other damage in a new planting.

◆ **Protect new vines from cold injury in their first spring.**

When vines are planted in early spring (April-May), protect new vines for a frost tolerance of 29.5°F. New growing tips can be easily injured during periods of cold temperatures and establishment will be inhibited.

In the second year, consider protecting only when temperature drops below 15°F. Mild frost events injure floral initials permitting more resources to go into vegetative growth. This practice will minimize the second year's crop.

◆ **Stabilize ditches until plants have vined in.**

It is important to minimize erosion on new plantings. Many types of materials (e.g., wooden cribs, curlex blankets) are available to serve this purpose. Refer to the Erosion BMP.

Some growers have reported that flooding a newly planted bog prior to or during torrential downpours disperses the energy of the water and helps to prevent large-scale washouts.

For further information:

Bog construction and renovation manual. 1998. UMass Ext. Publ., Cranberry Experiment Station, E. Wareham, MA.

Cranberry chart book - Management guide for Massachusetts. University of Massachusetts Cranberry Experiment Station.

Dike standard. 1980. Natural Resources Conservation Service Practice Standard #356. NRCS-NHCP. Amherst, MA.

Duffin, R. B. 1976. **Seepage control with bentonite.** Extension Bulletin 2240. Division of Agricultural Sciences, Cooperative Extension, University of California, Davis. 7 pages.

Rutgers University Blueberry and Cranberry Research and Extension Center. 125 Lake Oswego Road, Chatsworth, NJ 08019. (609) 726-1590.

Water Management Act. Information sheet. CCCGA.

Weed Management and Water Management BMPs in this series.



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