2010

Fresh Fruit Production

Carolyn J. DeMoranville
University of Massachusetts - Amherst, carolynd@umext.umass.edu

Frank Caruso
UMass Cranberry Station, fcaruso@umext.umass.edu

Joseph DeVerna
Ocean Spray Cranberries, Inc.

Fresh Fruit Production

Practices recommended for the preservation of environmental quality and effective management of the bog physical plant (e.g., water control structures, erosion control, pesticide storage and handling) are universally applicable regardless of whether a bed is producing fruit for processing or for the fresh market. However, certain practices require modification to effectively produce abundant, high quality cranberries for fresh fruit. This document should be used in conjunction with and in addition to the remainder of the Best Management Practices Guide, providing additional recommendations for the fresh fruit grower. This document was developed by the University of Massachusetts Cranberry Station and Ocean Spray Cranberries, Inc. and was reviewed by Massachusetts fresh fruit growers who provide fruit for several local brands.

Recommendations in this document are designed to be specific to fresh fruit production. For general recommendations regarding cranberry management, consult other portions of the Best Management Practices Guide and the Cranberry Chart Book.

Recommended Practices

Varietal factors relevant to fresh fruit:

The varieties 'Early Black' and 'Howes', native selections from Cape Cod, have been utilized for fresh fruit from the very beginning of the cranberry industry in Massachusetts. Although 'Early Black' is not as productive as other varieties, it became popular because of its earliness in ripening and its ability to grow in many types of cranberry soil. 'Howes' gained favor because of its attractive, well-colored, glossy berry that was frost resistant and had especially good quality. Several of the "fancy" cranberry varieties were preferred for fresh fruit from the 1850's until the 1970's. These included 'Black Veil', 'Centennial', 'Holliston', 'Matthews', 'McFarlin', 'Paradise Meadow', 'Shaw's Success' and 'Vose's Pride'. As water harvesting was established and became increasingly popular with growers, fresh fruit became restricted to 'Early Black' and 'Howes'. Lately, 'Howes' has become more in demand with handlers due to the need for additional quantities of late season fruit.

Choose varieties for fresh fruit based on favorable characteristics.

Those characteristics favorable for a good variety for fresh fruit include: earliness or lateness of ripening, frost hardiness, good productivity, fruit rot resistance, cranberry fruitworm and Sparganothis fruitworm resistance, and texture that avoids damage caused by the picking machines. Most handlers have preferences for certain varieties.

Nutrient Requirements:

Apply moderate rates of fertilizer. Avoid excessive use of nitrogen.

Productive cranberry beds require seasonal application of nitrogen, phosphorus, and potassium. Good production in Early Blacks and Howes is supported at rates of 10-35 lb/A N, 20 lb/A P, and 40-60 lb/A K per season. Hybrid cultivars may require additional N. In a fresh fruit bed, it is critical to limit nitrogen use to a rate that supports good upright growth and cropping but avoids excessive growth and runner production. Overly thick vine stands will encourage poor fruit keeping quality and disease, and also interfere with harvesting.

Use split applications for better control of growth.

It is too late to go back if excess N is applied early in the season. Apply low rates in the spring as needed to support adequate upright extension. This will vary by soil type and may be eliminated in some cases. Apply moderate rates during bloom and fruit set. A final application in early August will support bud development for the following year but should be limited or eliminated if runners are occurring.

Remember to reduce fertilizer use if late water was held.

Rates should be reduced up to 30% by elimination of the spring application and reduced rates during bloom. However, drastic reductions that could limit cropping in the following year should be avoided.

Water Management:

Use late water to reduce the incidence of fruit rot disease and improve keeping quality.

Late water is an especially helpful practice for fresh fruit growers. Late water floods typically reduce fruit rot disease and improve the keeping quality of the cranberry fruit. Late water should not be used more than one year in three and should be limited to years when demand for carbohydrate reserves has been minimal (good sunshine in previous year, healthy plants, and no winter injury or oxygen deficiency). Fungicide use may be reduced; consult the keeping quality forecast to determine how much reduction can be safely attempted. Unless the keeping quality forecast predicts fair to poor or worse keeping quality, one fungicide application should be necessary during the year that late water is held. Two fungicide applications should suffice during the year after late water. Fungicide rates can also be reduced during those two years to the minimal registered rate. Do not apply less than the lowest recommended rate. Late water also provides control of Southern red mite and cranberry fruitworm, but does not affect population levels of *Sparganothis* fruitworm. Late water will also reduce the spread of dewberries.

How to use:

Flood early to mid-April when plants have begun greening but buds are tight and red.

Do not use in more than once in 3 years or if vines are stressed. Use no herbicides prior to flooding.

Hold the flood for 30 days.

Scout for algae along bed edges. Check water temperature periodically beginning in the third week — if consistently greater than 65ºF early in the day, consider early removal.

Frost tolerance will be 25ºF if the flood is removed at 2-3 weeks. After 3 weeks, the tolerance will be 30ºF upon removal.

Expected outcomes:

Fruit rot suppressed — reduced fungicides possible.
Cranberry fruitworm suppressed — treat only if eggs are found after scouting.
Southern red mites controlled.
Dewberry growth suppressed.
Bloom compressed and synchronized — take note for cranberry fruitworm management.
Growth enhanced - use 20-30% less nitrogen fertilizer.
Keeping quality improved.

Use a fall flood to control pests when possible.

Depending on harvest schedules, fall flooding may be used post-harvest for the control of several pests. Because the flood cannot be initiated until after harvest, timing may be difficult. A one-week flood beginning no later than September 25 will control cranberry girdler. A three- to four-week flood beginning as late as the first week of October will control cranberry fruitworm (however, you should still scout during the following season). Four weeks of flooding suppresses dewberry.

Use a trash flood to minimize sources of disease inoculum and to limit girdler habitat.

Since leaf trash is not removed during a dry harvest operation, the trash flood is an important sanitation practice for a fresh fruit bed. Cranberry girdler feed on the bark just below the trash line. Thorough removal of trash limits habitat for this insect. In addition, fungal spores harbored on the trash are also removed, reducing the inoculum available the following year for the infection of the flowers and berries. Most beds will benefit from an annual trash flood.

The flood is applied post-harvest but before freezing conditions in order to remove missed fruit and leaf litter. Passing over the flooded bed with a water reel may be beneficial prior to collecting and removing the 'trash', but is not essential. Trash should be removed from the edge of the bed. Consider composting leaf trash (see the Composting Cranberry Leaves BMP for instructions)

Be particularly vigilant in frost management when protecting the fruit in the fall.

Fresh fruit handlers are quite intolerant of deliveries containing frost-damaged fruit. Growers must balance the need for a dry bed for harvest with the risk involved in allowing fruit to suffer frost damage. Be aware of weather conditions and monitor individual beds as needed. Make sure that sprinkler systems are well calibrated and uniform — the system must deliver 0.1" per hour for effective protection. Remember that fruit may begin to lose frost tolerance by late October due to physiological breakdown. This can increase the risk of sustaining damage when the bog is held at or near the tolerance without protection. Consult the Frost Protection Guide (available for no charge from UMass Cranberry Station) for more information (http://www.umass.edu/cranberry/pubs/factsheets.html).

Monitor soil moisture and depth to water table to schedule irrigation.

Most cranberry beds in Massachusetts are too wet, especially in the spring. This can lead to poor rooting, resulting in poor ability to survive dry periods and scald conditions. On the other hand, newly constructed upland beds can dry out quickly. Monitoring soil moisture with a water level float or tensiometer is a recommended practice.

Dry-harvest, fresh fruit beds can benefit from good irrigation scheduling and proper drainage by developing deeper roots. This leads to plants that are more resistant to environmental stress. In addition, proper water management can assure good fruit quality and high yield. When the bed is too wet, fruit rot disease is more likely to be a problem. Conversely, under-irrigating can lead to poor fruit quality due to transient shriveling/ softening on hot days, a condition that can hasten physiological breakdown of the fruit.

Be aware of scald conditions. Green fruit are especially susceptible.

Even if no scald damage occurs, temporary softening of the fruit due to inadequate moisture can result in compromised fruit quality at harvest and in storage. During hot conditions, it is critical that the bed be adequately watered prior to the onset of the heat. Critical conditions include: off-bed temperature greater than 80ºF, dewpoints less than 55ºF midday and early afternoon, clear skies, winds, and dry soil (no rain or irrigation in 48 hours). Remember that

under these conditions, the on-bed temperature can be as much as 20-30ºF higher than the temperature in the shade. In a well-rooted cranberry bed with adequate moisture in the soil at the beginning of the day, plants should be able to move enough water through and out of the leaves to provide cooling to the fruit and avoid scald damage. However, if soil moisture is not adequate at mid-morning, scalding of the fruit may occur unless sprinklers are turned on for 1-2 hours around noon. Remember that early morning irrigation is preferable.

Remember to monitor moisture and irrigate as needed up to harvest.
Approximately 10% of the final fruit weight is accumulated in September — most of this is water.

Horticultural Practices:

Do not sand fresh fruit beds heavily.
In fact, some growers are able to harvest only processed fruit in the year of sanding for a particular bed. Heavy sanding, in addition to reducing crop, can lead to physical difficulties for fresh harvest — machines need to be set closer to the soil surface and the teeth may dig into the sand.

Ice sanding is the method of choice.
Compared to ice sanding, barge sanding is less effective in anchoring runners. Dry sanding can result in rutting of the bed, as will any uneven sanding. Both of these outcomes are particularly negative for a fresh fruit bed since runners tend to interfere with harvesters and uneven ground can lead to increased fruit left unharvested. Dry sanding directly on the vines can cause significant injury to the plants and create an additional stress on the developing fruit the following year.

Vines training.
Vines should be trained with the particular dry picking machine to be used in subsequent harvests. The picking machines should never be used in a counter-clockwise rotation if the rotation is usually clockwise. Significant damage to the vines and runners will result.

Pruning is beneficial in a fresh fruit bed.
Pruning can reduce to some extent the need for sanding and can be used in training the vines for fresh harvesters. Pruning also improves light penetration and air circulation, limiting the incidence of fruit rot fungal infections and removes runners that can interfere with harvest. Western and Furford harvesters prune during harvest, while the Darlington harvester does not. Care should be taken to minimize vine injury as machines are moved around ‘corners’ in the beds.

If pruning is not part of harvesting, it can be done after harvest or early in the spring.
In fact, additional pruning of very dense stands by a second pass with a Furford harvester may be beneficial. In either case, no more than 0.5 tons/A of vines should be removed if pruning yearly or up to 0.75-1.0 ton/A every other year. Heavier pruning is usually associated with crop reduction. Pruning may be more critical for varieties like ‘Early Black’ that readily produce runners.

Cranberry pruning machines are usually a series of vertical knife blades set at an angle to the direction of movement and spaced at 1-foot intervals on a rotating frame. This device is mounted on a buggy or small tractor. A water picker modified to carry the pruning head has been used in Oregon. Such pruners move through the bed, removing runners and some uprights. The severity of pruning relates to knife spacing and speed of operation.

Disease Management:

Fruit rot management is critical for quality fresh fruit production.

This disease complex consists of more than a dozen different fungal pathogens. Some of these fungi can cause field rot, others can cause storage rot, and some can cause both types of rot.

In most situations, fruit rot can be effectively managed through the use of well-timed fungicide applications. Cultural strategies that are also helpful include regular sanding, properly timed irrigation, trash removal, late water floods, and vine pruning.

Under most circumstances, three fungicide applications, with the first one being applied at 10-20% open blossoms and the subsequent two applications spaced 10-12 days apart, will effectively manage fruit rot in Massachusetts. The choice of fungicide used for each application depends on the history of fruit rot in the particular bed in question and on the label of each fungicide. Particular care must be taken with the final application so that the pre-harvest interval does not delay the harvest of the fruit. One or two fungicide applications may suffice for 'Howes' or 'Stevens' that have greater fruit rot resistance than 'Early Black'. These fungicides should be applied at mid to late bloom. Once berries have been set and are sizing, further fungicide applications are unnecessary. Be careful to avoid the use of chlorothalonil on days where the temperature will exceed 90°F to avoid damage to the flowers or the young berries.

Fungicide use has already been described in the previous section on late water. Growers should utilize cultural strategies such as late water and judicious use of irrigation wherever possible, as these can also help reduce chemical inputs.

Since beds weakened by Phytophthora root rot can be more susceptible to fruit rot, Phytophthora management is important.

The fungus *Phytophthora cinnamomi* can cause tremendous crop losses in beds with significant areas of vine dieback. These areas of "acute" stress will produce no harvestable berries. Vines in peripheral areas of "chronic stress" caused by the fungus will possess fewer and smaller berries. In addition, the entire bed that is infested with the pathogen will often have very high levels of fruit rot because the plant's defenses are weakened by the stress on the root system.

The disease is managed primarily through drainage improvement and the application of either Ridomil or Aliette on a regular basis to the entire bed or as a spot treatment to the areas of worst infestation. Sanding low spots and fertilizing vines peripheral to the dead areas will also be helpful. Prevent infestation of uninfested beds by cleaning equipment and footwear before going from a bed that has the disease to one that is free of the disease.

Keeping Quality Forecast:

Observations conducted by Franklin and Stevens in the early 1900's revealed that cranberries had excellent keeping quality in certain years, terrible keeping quality in other years and that the variation could be predicted based on weather factors. Franklin and Stevens began making their first predictions of keeping quality in 1923 based on weather data and on incubator tests of berry samples. These forecasts proved to be accurate most years and they

continued until 1935. Franklin and Cross reinstated the forecast in 1949, putting out a preliminary forecast on April 1 (primarily for growers to decide whether to use late water) and a final forecast on June 1 (primarily for growers to plan their fungicide schedules).

The KQF is based on sunshine hours during February and March of the previous crop year, and for the current crop year, mean temperature and precipitation during March, April and May. Points are assigned for the various parameters; 10 total points for the preliminary forecast and 16 total points for the final forecast. The scoring system is set up such that the lower the total point score, the more vigilant the disease control tactics need to be.

Although the forecast continues to be accurate most of the time, cranberry cultivation is very different today, as opposed to the practices employed when the forecast was originally devised. Fresh fruit growers can still reliably depend on the forecast to help the planning process for the growing season. However, the KQF requires an in-depth evaluation to determine whether it can be improved and revised, based on the current management practices.

Use the KQF to determine whether to use late water and to schedule fungicides.
If the KQF predicts good or better quality fruit for that growing season, three fungicide applications or less should be required for a fresh fruit bed. If the forecast is fair or worse, a fourth or fifth application at shorter time intervals may be necessary, particularly for 'Early Black' beds. Fungicide rates should not be reduced unless the forecast is better than fair.

Insect Management:

Cranberry fruitworm egglaying may continue into late August and can be a serious problem for fresh fruit growers.

Berries should be monitored for eggs to prevent late-season infestation by larvae in fruit.

Although there is a single generation of cranberry fruitworm per season and although peak activity occurs in June and July, cranberry fruitworm moths may emerge in low numbers throughout the remainder of the season. Where population pressure is high, some beds may have substantial late-season moth flight. It is advantageous to keep populations checked by careful timing of applications of insecticides based on percent out-of-bloom counts, to make every effort to use fall floods, and to regularly utilize late-water floods. Consult local entomologists for information on availability of biorational insecticides for this pest.

Scout rigorously for Sparganothis fruitworm during the spring sweeping season. Sparganothis can be a critical pest for fresh fruit beds since the second larval generation may remain active at harvest. Fruit infestation by larvae is a cause for delivery rejection. Sparganothis is well controlled by monitoring and treating the spring generation (visible in sweeps by mid-May). Good control in the spring will greatly improve control of the summer generation, preventing late season breakouts and is critical when using the newbiorational insecticides. Late water does NOT control this pest but does tend to synchronize moth flight, making management easier.

Use alternative pesticides for *Sparganothis* management.
Natural enemies (wasps and flies that are parasitoids of *Sparganothis*) are very often key in successful management of this pest. Elimination of broad-spectrum compounds and the substitution of biorational compounds that specifically target *Sparganothis* will allow natural enemies to build up. Further, a large area of organophosphate-resistant *Sparganothis* exists in

Massachusetts. If your bog is in this area, treatment with Guthion, Orthene, or Lorsban will not be effective. Consult local entomologists and use alternative insecticides such as Confirm and spinosad products.

Use pheromone traps to determine peak flight of *Sparganothis*.
Insecticide applications to manage second generation larvae as they hatch, or just prior to hatching, are timed based on information gathered with the traps. Moth counts in traps need to be made weekly over a multi-week interval in order to determine peak moth flight. For insect growth regulators, e.g. Confirm, the onset of flight must be determined. Since timing varies depending on material used, it is important to consult the label.

Use an IPM approach to minimize pesticide use and residues.
Spray only when damaging numbers of insects are present. Use cultural controls, such as late water and fall flood, to enhance management of cranberry fruitworm, cutworms, and cranberry girdler (see the Chart Book for specifics).

Weed Control:

Map and prioritize weeds. Concentrate management resources on weeds that limit yield and interfere with harvesters.
In addition to their impact on yield, trailing dewberries can interfere with harvesting equipment. Clipping of tall weeds may eliminate seeds and limit tangling in harvest equipment. When weeds become tangled in harvest equipment, the likelihood of mechanical damage to the fruit is increased, leading to reduced keeping quality.

Be aware of how weeds invade the bog.
Limit ‘walk-on’ land bridges — though convenient, they are a route for weed invasion. Clean harvest equipment that might harbor weed seeds (especially dodder seeds).

Use care in applying oil with grass herbicides.
Crop oil can injure bloom, especially on hot days.

Manage dodder populations to limit spread and seed production.
In small infestations, consider hand-removal of seed capsules prior to harvest. Seed capsules may break open during harvest, spreading seed across the bog. If the infestation is extensive and pre-harvest removal is not possible, attempt to remove seed capsules from the bed by post-harvest trash flooding. Dodder seeds are long-lived and this pest can significantly reduce yield.

Timing of Harvest and Other Factors Specific to Harvest:

Berry harvesting conditions – moisture, heat, and sun.
Berries should be harvested when they are free from any moisture (dew or otherwise). Berries that are brought into the receiving stations moist will remain moist for an extended period of time and this will adversely impact keeping quality and pack-out percent.

Likewise, when warm berries are delivered, the berries remain warm for an extended period of time even if they are quickly put into refrigeration. Warm fruit are more susceptible to handling damage and decay because of their undesirably high respiration rate. The adverse impacts of moisture and field heat are especially conspicuous because berries stored in bulk tend to equilibrate much less rapidly than one might expect.

It is also important that direct sun exposure of the fruit be minimized — this includes berries left in boxes out on the bed, on the trucks adjacent to the beds, or on trucks sitting in the sun at receiving stations. Once the fruit is removed from the plant, it no longer has the ability to self-cool. Whenever feasible, shade the harvested berries.

Impact of berry maturity on keeping quality.

Less mature berries keep better in storage than fully ripened berries. For delivery of high quality berries one should harvest when the berries are ripe, but not overripe. Another reason not to delay harvest is the increasing likelihood of frost damage as the season progresses.

Berries continue to color in storage, so delivering berries at less than maximum color is not always a disadvantage to the handler. It is a known fact that color development in storage will continue but the rate will depend on storage temperature (the higher the temperature the quicker the rate).

How to judge optimal time for harvest.

'Early Black' has good keeping quality if harvested before the berries become overripe, prior to the end of September according to Eck (1990). Since 'Howes' ripen later, they can be harvested as late as the end of October. Harvesting prior to maximum color development will enhance keeping quality.

For early season berries, when the handler storage period is short, there is an increased need to pick berries when the color is adequately to fully developed since storage of these berries will be short. As the fresh season progresses, handler flexibility should increase, in which case, the grower can deliver berries that are a bit short of fully-colored.

Harvest method impact on fruit quality (harvester type, etc.).

The less the berries are handled the better the quality, and this starts right from harvest. In fact, it has been shown that hand-harvested berries have a much higher keeping quality than machine harvested berries. Of course no one can maintain an economical operation without utilizing mechanized harvest; therefore, one should deploy all reasonable methods to make machine harvesting as gentle as possible.

Furford dry picker

Darlington harvester

Three mechanical pickers are in use in Massachusetts, the Darlington, the Furford, and the Western (least used). Both the Furford and Western pickers prune the vines. The Darlington and Western pickers are limited by low capacity (fewer acres per day), a tendency to leave fruit behind, and berry bruising. These drawbacks are less severe with Furford pickers. The Furford is known for high harvest capacity. However, it has been reported that the Furford machine is more damaging than the Darlington machine. Conversely, Darlington pickers seem to require more maintenance time. For each machine, there are equipment modifications that can make these machines less injurious to the berries. Consult local fabricators and distributors for more information.

Impact of physical abuse on keeping quality.

Berry handling is arguably the single most important factor determining berry quality. Even if crop management has been perfect up to harvest, poor fruit handling can be your downfall. As soon as a fruit is damaged (in the field, during harvest, etc.) the fruit respiration rate increases and the keeping quality of that fruit decreases. The presence of damaged fruit indicates that other berries not yet showing damage may also be deteriorating.

Anything that minimizes the impact of berry handling and injury will improve keeping quality. This in turn will mean higher pack-out rates for the handler, and better quality berries for the consumer.

Harvest employees should be trained in proper fruit handling and harvester operation. Fruit damage may be increased by improper equipment operation and tangling of the machine in weeds or runners. Fruit should be handled gently - minimize the drop distance to the bin floor when transferring fruit. Do not dump the fruit from a height. Avoid larger bulk bins, as there will be a certain amount of fruit that are crushed at the bottom of the bin.

On-farm detrashing to remove prunings generated by the harvester will introduce another handling step prior to fruit delivery. Again, this operation should be evaluated to eliminate any practices that bruise the fruit and employees should be properly trained to avoid fruit bruising.

Post harvest storage:

The quality of the harvested berries has much to do with their ability to be held in storage. Any adversity in the form of disease, sunscald, frost damage or especially mechanical damage will adversely impact the ability of the berries to keep, and the quality of the finished product.

For ideal cranberry storage and post-harvest handling, fruit should be refrigerated at a constant temperature. Storage between 36ºF and 40ºF is optimal. Storage at cooler temperatures (below 36ºF) is not recommended because cooler temperatures increase the incidence of physiological (sterile) breakdown. Refrigeration works by slowing the respiratory activities of the fruit and the spread of any pathogens the fruit may contain.

Whether or not a handler chooses refrigerated storage will depend on a number of factors. Refrigerated storage is expensive and sometimes hard to justify, especially considering the short length of the fresh cranberry season. Accordingly, the cost of refrigerated storage must be weighed against the quality of the incoming fruit, expected period of fruit storage, and the expected ambient temperature conditions postharvest. Refrigeration helps to maintain fruit quality but it is by no means the only factor impacting quality.

Little is known about the impact of relative humidity on storage quality of cranberry but conditions leading to moisture on the berry surface will accelerate fruit deterioration.

Familiarize yourself with handler standards for fresh fruit.

There are three major, and many minor fresh-fruit handlers in Massachusetts. Each handler sets standards based on their own needs, and as dictated by government rules and regulations. Handler standards vary from year, and the following is a list of those standards that are most important.

Fruit contamination – all delivered fruit must be at or below EPA set tolerance levels for any approved pesticide that is used on cranberries. Further, fruit must not be contaminated with any form of food-grade or non-food grade based lubricant of any kind.

Standard tests – Each handler will have specific standards by which they grade or accept fruit. Standards may be based on the USDA's standard for fresh cranberries. This standard includes grading criteria for the presence of bruises, frost, mold, fruit-firmness (soft or decayed), scald, insect presence, or insect damage.

Additional factors - Handlers also require that fruit be delivered dry, and with a minimum of chaff. Fruit keeping quality and pack-out percentage are also very important quality and profit components and payments may reflect these factors.

Learn about Good Agricultural Practices (GAP) standards.

With food safety becoming a greater concern among consumers and retailers, there has been an increased demand that fresh fruits and vegetables meet certain conditions. One of those conditions has been Good Agricultural Practices, or GAPs, which seek to put in place practices that will help to limit microbial contamination on the farm. To date, this is a voluntary program that is not mandated by law. However, the buyers that your handler sells to are calling for fresh fruit cranberries to come from GAP certified farms. Currently this is being limited to those berries bound for fresh fruit markets. To receive certification, you will then have to pass an audit by a third party, either the USDA or one of the many commercial firms available.

Please go to the Cape Cod Cranberry Growers Association web site and read the many relevant documents relating to GAP: http://www.cranberries.org/growers/alerts_gap.html.

Prepared by Carolyn DeMoranville, Frank Caruso, and Joseph DeVerna (Ocean Spray Cranberries, Inc.), 2003.

Fresh Fruit Production Checklist

- ✓ Choose varieties for fresh fruit based on favorable characteristics.
- ✓ Incorporate the many flooding options available into pest and vine management.
- ✓ Be particularly vigilant in frost management when protecting the fruit in the fall.
- ✓ Use ice sanding whenever possible and do not heavily sand vines in general.
- ✓ If pruning is not part of the harvesting procedure, plan pruning events for the spring.
- ✓ Use the KQF to determine whether to use late water and to schedule fungicides.
- ✓ Practice good management in terms of insect and weed management as well.
- ✓ Become familiar and get training in GAP standards if applicable.