



# Berry Notes

Volume 14, 2002

Prepared by the University of Massachusetts Fruit Team

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<http://www.umass.edu/fruitadvisor/berrynotes/index.html>

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## Message from the Editor:

**Monthly Issues of Berry Notes to Resume:** This issue of Berry Notes makes the resumption of monthly issues for the remainder of this year.

**Late Summer and Fall Weed Management** are key activities at this time of year. This issue contains information on late season weed management in several crops.

**Grape Harvest** is around the corner. See the Grape section for information on harvest parameters.

**Sprayer Tune-up:** Mid-season is a good time to tune-up your sprayer. Clean all screens and replace nozzle tips and cores if worn. Once the sprayer parts have been cleaned and/or replaced, recalibrate the machine. Be sure all nozzles are spraying the same amount of material.

**Farmer/Grower Grants:** The Northeast Sustainable Agriculture Research and Education program (SARE) offers funding for farmers to try a new crop, an innovative marketing or production technique, or a practice that will be beneficial to your community. In 2002 the average grant size was \$5,280. Application forms are now available for funding in 2003. These must be postmarked by December 9<sup>th</sup>, 2002. Contact: NE SARE, Hills Building, Burlington VT 05405-0082 or Call (802) 656-4656 or email [nesare@zoo.uvm.edu](mailto:nesare@zoo.uvm.edu).

## ENVIRONMENTAL DATA

### DROUGHT UPDATE FOR MASSACHUSETTS

*Stephanie DeGray, & Craig Hollingsworth, UMass Extension*

The Massachusetts Drought Management Task Force meeting on July 25, 2002 continued the Statewide Drought Advisory, with particular concern for the Cape Cod and Southeast regions of the state. The Drought Advisory indicated a level of dry conditions across the state that warrant tracking by state, federal and local agencies. The advisory level is the second of five action levels related to drought conditions that are outlined in the MA Drought Management Plan. The five action levels of the Drought Mgmt. Plan are: Normal,

Advisory, Watch, Warning and Emergency. We have reports that this has just been updated to "drought watch."

**Rainfall:** The National Weather Service has forecasted normal temperatures and below normal precipitation for the months of August, September, and October. The Massachusetts water year 2002 (starting October of 2001) showed precipitation deficits through the end of July 2002 of five to nine inches. Most regions of the state received between 22 and 62 percent of the normal July precipitation

with an overall value of 51% of normal for the state. Precipitation for the water year statewide is estimated as 79% of normal.

**Surface Water:** Stream flows (monitored by the US Geological Survey) are at below-normal levels for much of Massachusetts. July stream flow is reported below normal throughout the state. Stream flow declined rapidly during July and August as a result of below normal precipitation. Long-range forecasts are for continued dry conditions through October.

Water supply reservoirs improved across the state when we had above-normal rainfall between March and June. Yet, some remain below normal levels for this time of year. The Quabbin Reservoir, operated by the Metropolitan District Commission, is at 84.5%, remaining in the below normal system status. However, due to its large storage capacity, the system can withstand extended dry periods without affecting its ability to supply water. The Worcester Reservoir is reported to be at 79% below normal system status, and the Cobble Mt. Reservoir is at 71%.

**Groundwater levels:** The Massachusetts Department of Environmental Management reports that ground water levels have returned to the “overall” normal range in much of the Commonwealth with some areas in the central, northeast and southeast regions remaining below normal. The Cape and Islands continue to have below normal groundwater levels, a situation that has existed since June of 1999.

Current data from the United States Geological Survey (USGS) indicate a bleaker picture. USGS maintains a series of observation wells throughout the country where depth to groundwater is digitally recorded, up-linked to satellite and posted on their website. In Massachusetts there are nine observation wells and the website URL is: [http://ma.water.usgs.gov/ground\\_water/ground-water\\_data.htm](http://ma.water.usgs.gov/ground_water/ground-water_data.htm).

The table below is a summary of a small part of the data from the website. It indicates that most (6 out of 9) of the wells are below normal levels (25% quartile), while three of the wells show normal (50% quartile) groundwater levels.

#### DEPTH TO GROUNDWATER AT USGS OBSERVATION WELLS IN MASSACHUSETTS

Well Site	County	Historic Mean for August (ft)	Depth of GW. (ft) on 8/13/02	Quartile in June	Quartile on 8/13/02
Brewster	Barnstable	31.0	33.1	25	25
Lakeville	Plymouth	17.1	19.5	25	25
Duxbury	Plymouth	9.3	9.6	25	25
Norfolk	Norfolk	6.7	7.7	50	25**
Pelham	Hampshire	14.5	17.8	25	25
Pittsfield	Berkshire	18.5	19.2*	50	50
Acton	Middlesex	19.4	20.3	25	25
Wakefield	Middlesex	8.2	8.2	50	50
Wilmington	Middlesex	9.2	9.5	50	50

\* Current Data not available. Data is from Aug. 8, 2002. \*\*Site dropped into a lower Quartile.

More drought information with links for many data-rich sites can be found at the UMass Extension Drought Information website at <http://www.umassdroughtinfo.org>. In addition, much of the information contained within this article may be found in the MA Department of Environmental Management,

Report on Current Water Conditions in MA, August 8, 2002; is located at: <http://www.state.ma.us/dem/programs/rainfall/>. A map of groundwater levels can be found at: [http://water.usgs.gov/cgi-bin/dailyMainW2?state=ma&map\\_type=real](http://water.usgs.gov/cgi-bin/dailyMainW2?state=ma&map_type=real) (*Source: Vegetable IPM Newsletter, Vol. 13, No. 16, August 15, 2002*)

#### Weather Data

This information is intended for use as a guide for monitoring the developmental stages and planning management strategies of pests in your location. Growing degree day (GDD) and precipitation data was collected for the two-week period, Aug. 8 through Aug. 21, 2002. Soil temperature and phenological indicators were observed on Aug. 21, 2002.

Region/Location	Growing Degree Days		Soil Temp (4" depth)	Accum. Precip
	2 Week Gain	Total		
<b>Cape Cod:</b> Barnstable	365	1984	89° F	0.15"
<b>Eastern:</b> Hanson	351	2047	72° F	0.88"
Waltham	414	2425	66° F	0.32"
<b>Central:</b> Boylston	345	1865	72° F	0.29"
<b>Western:</b> Amherst	288	2017	67° F	0.25"
Great Barrington	258	1753	63° F	0.42"

(*Source: UMass Extension Landscape Message #21, Aug. 23, 2002*)

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# Strawberries

## Strawberry Fruit Bud Development

*Bruce Bordelon, Purdue University*

: Now is the time to fertilize strawberry fields with 20 to 50 pounds of nitrogen. Applications around mid-August stimulate flower bud initiation during the fall months. Rates depend upon amount of nitrogen supplied at renovation and plant vigor. New fields with high vigor

may not need additional nitrogen now, but most older fields should benefit. Irrigation during this time is also extremely important, especially in areas of the state that have not received much rainfall. We suggest about 1 inch per week. (*Source: Facts for Fancy Fruit - 02-11 August 7, 2002*)

### Fall Herbicide Applications for Strawberries:

*Bruce Bordelon, Purdue University*

A number of herbicides can be used on strawberries during late summer and fall to prevent weed germination, kill emerged weeds, and provide residue control until the following spring. The key set of weeds you need to control during this period are fall germinating winter annuals such as chickweed and shepherd's purse. You may also need to control wheat, oats, or rye that come from seed in the straw mulch that you apply for winter protection.

**Devrinol** (napropamide) is a preemergence herbicide. It can inhibit rooting of daughter plants so it should be applied after early forming daughter plants have rooted. Late forming (after late August) daughter plants do not contribute to yield and Devrinol can be applied before these plants root. Devrinol must be applied before winter annuals and small grains emerge. Devrinol provides excellent control of small grains and some winter annuals such as chickweed. Devrinol must be moved into the soil by cultivation or water after application.

**Dacthal** (DCPA) is a preemergent herbicide that can be used in new plantings or immediately after renovation. It provides good control of many grasses and some broadleaves such as purslane and lambsquarter. Like Devrinol, it must be applied before weeds emerge.

**Sinbar** (terbacil) is primarily a preemergent herbicide but it has some postemergence activity against small susceptible weeds. Fall applications of Sinbar should only be applied after the strawberries are completely dominant. If Sinbar is applied to actively growing strawberries, injury can occur. Cultivars differ in tolerance to Sinbar. In general, less vigorous cultivars have greater injury. Applications are most effective when applied to the soil and activated by rainfall or irrigation. Sinbar provides excellent control of many winter annual weeds. Fall applications of both Devrinol and Sinbar will persist to the following spring.

**Poast** (sethoxydim) is a postemergent, grass active herbicide. The grasses must be actively growing. Thus Poast should be applied in late summer or early fall before plants become dormant. Also make sure that you scout your fields to determine which grass weeds are present. Summer annual grasses, such as foxtails and crabgrass, will be killed by fall frosts, and do not require Poast applications for control. Poast is more effective against annual than perennial grasses. Poast can be used in the fall to suppress perennial grasses such as quackgrass; control early emerging small grains, and kill winter annual grasses such as wild oats and downy brome. Poast must be applied with a crop oil.

A systemic, postemergence broadleaf herbicide, **2,4-D**, can be applied when strawberries are dormant to control some winter annuals. 2,4-D provides good control of many mustards and shepherd's purse, but is not very effective against chickweed. The herbicide should be applied to actively growing weeds. Be careful of 2,4-D drift causing injury to non-target plants.

**Gramoxone Extra** (paraquat) can be applied as a directed spray between strawberry rows, using shields to prevent contact with strawberry plants. Gramoxone is a nonselective herbicide, so it will kill or severely injure strawberries it contacts. Gramoxone is a restricted use pesticide and is extremely toxic to animals including humans. It provides excellent control of annual grass and broadleaf weeds. Gramoxone does not extensively translocate in plants so it does not control perennial weeds. Weeds should be actively growing when Gramoxone is applied.

In conclusion there are a number of herbicide options that can be used on strawberries during the fall. Select herbicides that will control problem winter annuals and small grains. Herbicides such as Devrinol and Sinbar can provide residue weed control until spring. Adapted from an article in the Illinois Fruit and Vegetable News by John Masiunas (*Source: Facts for Fancy Fruit - 02-11 August 7, 2002*)

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## Brambles

### Fall Bearing Red Raspberry Production in Maryland Tunnels

*Bryan Butler and David Lankford, University of Maryland*

#### **Bramble Preamble**

Along with Kathy Demchak at Penn State, we have been attempting to adapt primocane, fall bearing red raspberry culture to tunnel culture in the Mid Atlantic States. See the following article regarding the general tunnel definition and experiences we have had using tunnels. We have, until recently, been focusing on stretching the season into November and December. Our experience has been that in Carroll County (North Central MD), unheated houses have protected the fruit until mid November twice and into mid December once. We have used the MD/VA/NJ/WI cooperative breeding program super sized, late fall, selection: ND-f1 (avg. 6 gm) to extend the season. We are now experimenting with raspberry potting systems to increase the opportunity to use the tunnels for other crops in the summer, for example day neutral strawberries.

Recently, Harry Jan Swartz gave us a new early fall selection to try, QEG-f1 (see it on [www.fiveacesbreeding.com](http://www.fiveacesbreeding.com)). He said he thought it was early, it was. On the middle eastern shore, in unheated tunnel, potted plants were producing fruit in late May -- on primocanes. In Carroll County, the "fall crop started in early July. Fruit has been coming off at 1/2 to 3/4 ton/acre rates since at both locations (the plantings are small so this is a gross extrapolation). Fruit size outdoors at The Berry Farm in Matawan NJ, where production started the week of the 20th of July, has averaged 3.4 grams/fruit (its probably higher in the tunnels). Now, consider that temperatures have been very hot, in the 90's most days in July at all locations. Fruit quality at indoor and out has been excellent, especially flavor in the tunnels. QEG-f1 flavor has been the best of all selections tried, including Anne. Anne and Caroline are a 2-3 weeks later than QEG-f1 and Anne has good to excellent flavor and size as does its more productive seedling, OAY-f1 (both golden raspberries). Other selections are not as promising, but we are just now trying Caroline and Josephine, two other cultivars from the program. Although new fruiting canes are being produced by QEG-f1 to extend the fall crop season, we are trying pruning to extend the production of individual canes once they have stopped.

Yes, Tiny Tim, we'll have raspberries for Christmas, and "fall bearers" for the 4th of July!

#### **The Basic High Tunnel**

A high tunnel is a simple inexpensive structure similar to a greenhouse that provides a great deal of season extension versatility. High tunnels offer the opportunity for the grower to get a crop in early in the season, to stay

in production later in the season, and, possibly to produce a crop such as greens through the winter. High tunnels also provide protection from rain and hail and can reduce disease and pest pressure. In Maryland, the seasonal weather patterns vary greatly from one year to the next and even with these unheated tunnels it is difficult to confirm exactly the best timing and choice of crops. However, with good planning, variety selection, and close management, this low cost system can add another dimension to a vegetable or small fruit operation.

In a high tunnel system, the tunnel is large enough for the grower to plant, monitor and harvest the crop from inside the structure. The standard tunnel is 14 feet wide, 96 feet long, and 7 feet 6 inches tall at the center. Tunnels should be no wider than 30 feet, for good cross ventilation and reduction of snow accumulation on the roof in the winter. The Quonset frame consists of metal bows made by bending steel pipe or tubing and potential stresses caused by the weight of snow or heavy wind must be considered.

Metal pipes are driven into the ground approximately 2 feet deep and set every 4 feet of the high tunnel length, providing support for the Quonset frame. The bows fit into the ground pipes and are attached by bolts. The ends of the structure can be plastic or wood on a wood stud frame, but should be removable to allow access for tillage equipment and to increase ventilation in the summer. The structure is typically covered with a single layer of 6-mil polyethylene with provisions for rolling up the sidewalls. The poly is secured onto a batten board on each side of the high tunnel about 3.5 feet above the soil line. A vertical sidewall helps to keep rain out of the tunnel and when rolled up, provides ventilation. A pipe is then attached to the loose bottom end of the plastic along the length of the structure. A "T" handle on the end of the pipe is used to roll the plastic onto the pipe to open the sides. Cross ventilation is assisted by wind and has proven to be very efficient.

The key to successful use of the high tunnel is to spend the time laying out and preparing the site for construction. The better the tunnel is constructed, the easier the roll-up sides will work and the easier it will be to ventilate. During periods of cold weather the sides are lowered in the afternoon to hold heat and then raised in the morning to vent before temperatures inside get too high. The floor of the structure is covered with a layer of 6-mil black plastic. This helps to raise the temperature inside the house, control weeds, and prevent evaporation of soil moisture. Excess moisture will raise humidity in the tunnel and may lead to disease problems. Humidity of the air will increase at night as the air cools down. Venting in the morning will allow drying of any condensed water.

High tunnels can actually reduce the incidence of some diseases, particularly if trickle-irrigation tubing is used underneath the black plastic mulch. No water (rain or irrigation) gets onto the foliage to transport spores or otherwise encourage disease development.

### **Benefits for Production**

The use of high tunnels for crop production creates a microclimate that provides the opportunity to increase quality. Since the plants are grown in a structure covered with one layer of plastic, the foliage, flowers, and fruit do not get wet. This can reduce the incidence of many diseases. The soil does not become excessively wet since the only water supply to the plants in the tunnel is trickle irrigation. Proper water management will also help to reduce the incidence of certain root rotting diseases. The single layer of plastic only reduces light levels about 10% as compared to growing outside. Therefore photosynthesis is not reduced except in shaded parts of the plant canopy. Temperatures inside the tunnel are usually warmer than outside temperatures, providing the environment for season extension. The floor in the house will not freeze during most winters. This allows work to be done with soil amendment incorporation or the growing of a cover crop during the coldest part of the winter. Since the floor receives no rainfall, if irrigation is done carefully the area between the beds becomes too dry for weeds to germinate. The roll up sides that truly make the structure a high tunnel provide passive ventilation to cool the structure and to dry the foliage, again helping to reduce disease incidence. These sides can be lowered in the evening to hold in heat and can protect at tender plants from blustery conditions. The structure will also provide a foundation for the use of plastic netting for support, shade cloth, and row covers for increased plant protection on cold nights.

### **Potential Problems**

The use of high tunnels does require an increase in both the level and the amount of management required to grow the crop. The sides must be raised and lowered to

regulate temperature and humidity. Plants must be irrigated regularly and fertigated as needed. Plants can be grown on raised beds covered with plastic or landscape fabric with the rows in between bare dirt, or the entire floor can be covered with landscape fabric. Unless supplemental heat is provided the tunnel may not be able to provide adequate protection to the plants after the November/ December time frame depending on the year.

Disease problems may occur in the protected environment; management of the environment is critical. Ventilation to avoid high temperatures or high humidity is very important. Maryland's unpredictable weather in spring and fall will make management intensive. Powdery Mildew is one disease that may be favored by the high tunnel climate and should be monitored for closely.

Insects will find the microclimate created for the plants to be favorable to their growth also. Without a doubt, integrated pest management (IPM) scouting must begin when the plants are set out. The use of beneficials may be the most practical way to deal with some insect and mite problems. However, season extenders can actually be used as physical barriers to keep insects off the plants. For example, screening the sides to exclude insects, and the use of floating row covers that have the edges secured will prevent many insects from reaching the crop.

Pollination for many crops such as raspberries, strawberries and tomatoes is provided to a large extent by the large amount of air movement from side to side. However, bumble bees or honeybees may be required to maximize production in the early and late part of the season when the sides are rolled up less often. Maryland researchers are currently examining the use of a honeybee hive placed at the end of a tunnel with the opposite end open during the day. The bees flying in and out will stop off on the various flowers on their way in and out each day, which should provide adequate pollination. Further research regarding the use of bees is being planned.... (*Source: The Bramble, Vol. 18, Issue 2, Summer 2002*)

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## **Blueberries**

### **Blueberry Herbicides**

*Gary Pavlis, Rutgers University*

A grower asked a very good question this week regarding the use of Roundup. I've mentioned that July and August is an excellent time to eliminate problem weeds because now is the time when there is movement of plant substrates down to the roots. That means Roundup will move to the root and kill weeds more efficiently. The grower asked if the dosage of Roundup should be changed if mulch or woodchips are used in the blueberry field and if soil type would have an effect on efficacy or possible damage. I'm sure this question was

asked because an increase in organic matter due to mulching does effect herbicide efficacy. So does soil type. An increase in organic matter and/or an increase in soil weight (sandy -> clay) requires higher rates of pre-emergent herbicides. This is not so with Roundup because the material is sprayed directly on the weed. I talked to Monsanto, the maker of Roundup and they agree with the information above. A 2% solution, i.e. 22/3 oz. of Roundup, 41% a.i./gallon will kill most problem weeds.

Growers should be aware of problems observed in numerous fields concerning the use of Solicam. This herbicide has been used more and more recently with excellent results, however there may be a potential for problems. I stated in an earlier newsletter that I had seen plant leaves with yellowwhite veins, and stems that were yellowwhite. These symptoms are definitely due to Solicam. Affected plants were usually in the poorest part of a block. Additionally, it should be noted that the symptoms probably are drought related because extensive irrigation moved the chemical down into the

root zone. This chemical remains in the soil for a longer time than most other herbicides used in blueberries and thus has the potential to build up. My feeling at present is to recommend that anyone using Solicam should consider rotating an alternate herbicide in the coming year. This is especially true if you saw the symptoms described. Remember that leaves with green veins and yellow interveinal areas are not due to a herbicide but most probably iron deficiency due to a high pH. (*Source: The Blueberry Bulletin, Vol. 18, No. 19, August 22, 2002*)

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## Grapes

### Grape Update from Long Island, NY

*Alice Wise, Cornell University*

**Week of Aug. 19:** The week started with intense heat. Mid-week however, temperatures dropped to a more comfortable mid-80's. A sprinkle on Aug. 20 did little to alleviate the drought. As of Aug. 22, showers are predicted several times over the next week though nothing looks certain.

Merlot blocks were through or just about through veraison by Aug. 23. Cab blocks are a little behind but not much. Harvest is right on schedule.

**Powdery Mildew Meeting:** Grape pathologist Wayne Wilcox will visit Long Island on Monday, Sept. 9. A meeting at LIHREC is planned for 5 p.m. While it is still fresh in everyone's mind, we will try and understand why powdery mildew became an issue in some blocks and not others. The week prior, we'll be collecting information from growers – materials used, rates, intervals, sprayer, PSI, when PM was first seen, varieties affected, etc. – to see if there are any trends. This survey is important – this kind of disease issue has not occurred in a long time and we need to seize this opportunity to examine our management practices. All information gathered will remain anonymous. Pesticide recertification credits will be offered for this meeting. Call Alice or Libby @ 727-3595 for more information or to participate in the survey.

**Fruit Sampling After Veraison:** Fruit sampling after veraison is used to monitor the progress of the crop. Typically, blocks are sampled every second to third week, more intensively as harvest approaches. The most common tests are pH, titratable acidity and Brix.

There is some debate on the best technique for fruit sampling. In his classical work "Knowing and Making Wine", enologist Emile Peynaud recommends taking 250 berries per block. Only one berry per plant must be sampled, varying the side of the cluster exposure and side of the row, so that the sample is as close to random as possible. It is also recommended that the same person do the sampling each time. This will help eliminate differences due to sampling technique.

Others feel that berry samples can be very inaccurate, as the sampler often unconsciously chooses the plumpest or the reddest or the softest berry. They choose to sample entire clusters rather than just berries. This method is controversial, since, in order to get an accurate read, a fairly large quantity of fruit will be removed from the vineyard with each sample.

An article in the French trade magazine *La Vigne* addressed a new method proposed by INRA of Bordeaux (a governmental research organization). They emphasize that the vines selected for sampling must present the average for the block, that is, they must be neither too vigorous, nor too weak. The vines must have an average pruning weight.

INRA has found that there can be variable ripening within a cane or cordon (e.g. one side of a vine). For example, often clusters closer to the head of the vine or at the ends of the canes are precocious in their maturity. They therefore recommend that only clusters found in the middle 2/3 of a cane or cordon be sampled. They found that fruit in this area more nearly approximates the average for a given block.

The shoot selected should be of average diameter for the block. While research results have been most consistent when the basal clusters are sampled, it can be too time consuming to always locate the basal cluster. The basal cluster or the second cluster from the base are therefore seen as suitable for sampling.

There also can be variable ripening within a given cluster. Generally, the lower part of a cluster is slightly behind the upper part. It is therefore advised to alternately sample the upper and lower parts of a cluster. It would also make sense to sample both exposed and non-exposed sides of a cluster.

Samples of 200 berries in groups of 3-5 berries per plant are recommended. This would be equivalent to between 40 and 65 vines per block for 9x8 spacing. For local vineyards with small blocks (<2-3 acres), sample at least 20 vines/block, so that 100-150 berries are collected. If one area of a block grows differently than another, sample each separately. Three to five berries per cluster is desirable, because, according to

INRA, sampler bias is minimized this way. They point out that sampling small groups of berries will better represent the morphological diversity of berries that exists in a vineyard. The 3-5 berries should be contiguous, or adjacent to one another. In a loose cluster, a small arm of the rachis (cluster stem) can be snipped off. In a more compact cluster, the berries will have to be individually selected, but they should still be adjacent to one another.

Happy sampling. And don't forget to taste the fruit! Across the world, many vineyard managers and

winemakers also base their harvest decisions on the taste, texture and appearance of the fruit.

#### References

Peynaud, Emile. 1984. *Knowing and Making Wine*. John Wiley & Sons, NY., pp.78-79.

[Fruit] Sampling: A More Precise Method. *La Vigne*, July-August, 1993. Publ. by Groupe France Agricole, Paris. (Source: *LI Fruit & Vegetable Update*, No. 24, August 23, 2002)

## Grape Harvest Parameters

*Bruce Bordelon, Purdue University*

Grape harvest is a few days behind normal this year. Early varieties will be harvested in southern Indiana this next week. Growers should be sampling their vineyards and analyzing fruit composition (sugar, acidity, and pH) to determine the appropriate harvest date. As harvest nears, sampling should be done at least twice weekly to track the progress of fruit ripening. Samples should be representative of the entire vineyard so avoid end plants and other atypical plants when sampling. As fruit ripen, sugar concentration increases, titratable acidity decreases, and pH increases. Flavor and color also develop as the ripening process occurs. It is important to pick grapes at their peak ripeness level because grapes do not continue to ripen after they are harvested.

The level of ripeness desired at harvest depends on the variety and style of wine to be made. For light, fruity style wines, grapes are usually harvested before they are fully ripe. This is especially true with strong flavored American varieties, such as Concord and Niagara, and some French-American hybrids such as Cayuga White. When grapes are harvested before full ripeness sugar may have to be added to the must before fermentation, but the results are a lighter, fruitier wine without the overpowering 'foxy' flavor. For heavier, full-bodied wines, fruit is usually allowed to fully ripen before harvest to develop full flavor, color, and tannins. If you will be selling to a winery, keep them updated on fruit composition and let them help make harvest decisions

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based on their needs. Grapes for fresh consumption can be picked based on taste. Sugar/acid ratio will determine when fruit tastes best.

Sugar (soluble solids) is the easiest parameter to measure, but is not the best indicator of optimum fruit ripeness for winegrapes. Instead, a combination of soluble solids, titratable acidity, and juice pH should be considered. Of the three parameters, juice pH is perhaps the most important. High juice pH can be a problem with certain varieties especially in warm growing seasons, and causes many problems for the winemaker. Several wine quality attributes are adversely affected by high pH including color, protein and tartrate stability, oxidative rate, metal complexing, ability to clarify, biological stability, and sensory attributes. Since pH cannot be adjusted in the winery as easily as titratable acidity or sugar content, it is best to harvest fruit within the desired pH range. Most winemakers prefer white winegrapes with a juice pH of about 3.1-3.2 and red winegrapes with a pH of 3.3-3.4.

During harvest, protect fruit quality by picking early in the day while the fruit is cool, handling the fruit carefully to avoid cracked berries, juice leakage, and potential spoilage, and keeping the fruit cool by moving containers out of the vineyard quickly and placing them in shade or cold storage. Minimize the time between harvest and crush as much as possible (Source: *Facts for Fancy Fruit - 02-11 August 7, 2002*)

## A Sustainable Vineyard Helps to Create a Sustainable Planet

*Mark Chien, PennState University*

As I look around me every day and see roads cluttered with gas guzzling SUVs, I often wonder about the long-term sustainability of our planet. With a world-wide uneven distribution of wealth and increasing scarcity of resources, we appear not to be acting responsibly or in the best interest of our children or land. How long can our "take but do not give back attitude last"? Oil, coal,

timber, fish, soil, and countless other animal and plant species are all threatened. And what do we often leave in return? Often its pollution... be it agricultural run off, smog, ozone holes, dying seas or the by products of our own modern lives. I'm not really in a position to comment about your personal life style, but perhaps we can help ourselves as a community of conscientious farmers and wine producers. I

believe strongly that we have an obligation to both our environment and fellow man. Many of you know that when I was in Oregon, I helped to develop a program called Low Input Viticulture and Enology (LIVE). Live was developed by growers, for growers, in an attempt to lessen off farm inputs and create a "best practices" program that would approximate a sustainable form of viticulture. The idea had been developed in New Zealand and Europe and we employed these models to form our own program, the first in the U.S. and still the only one sanctioned by IOBC, an international sustainable agriculture organization based in Switzerland.

Two weeks ago I was on Long Island to talk about sustainable viticulture to a group of grape growers whose fearless extension leader, Alice Wise, has taken the lead on creating a sustainable program for Long Island vineyards. This is a major undertaking for Alice and a great step forward for eastern viticulture. I believe that this program, once implemented, will be a model for all eastern vineyard regions and it strongly represents why LI is the leader in viticulture in the U.S., outside of the western states. The problems in eastern vineyards, as each of you know, are much more complex than those in the drier western states (yes, even in Oregon). We must deal with fungal diseases and insect pests, which love our warm, humid continental climate. Because we have all grown up in a world that preaches better living through chemistry, our attitude has evolved to spray our way out of every tight situation. We may not be able to wean ourselves completely from this behavior, but we can certainly strive to modify it.

The environmental situation on the North Fork has always been a dicey one. In the 1980s, when I was working there, Temik was leaching into ground water and causing grave concern. With such a vast urban-agriculture interface, the issues are more sensitive than ever. Alice was approached by EPA to develop a sustainable plan for grapes and is using federal grants to do the work. This is one case when the government showed up at the door and actually could do something to help. Alice has a small committee of dedicated growers who are working on developing a plan for Long Island.

While only in its formative stages, the program simulates all of the best features of other plans in Oregon and California. The only difference is that it might not be quite as rigorous. This may be necessary initially as we attempt to adopt a sensitive form of viticulture to our challenging eastern conditions. It focuses on most of the common viticulture practices including - disease, pest, weed control, sprayer maintenance, record keeping, compliance, fertilizer, soil and water management, continuing education. Each category has a set of guidelines that represent the best viticultural knowledge in their region that has the least impact on the environment. They encourage good stewardship of the

land and view the total farm as a sustainable ecological system.

The framework of the system is built on a rating system that assigns scores to each guideline with a category, such as weed control or soil care. Ultimately, points are given or taken away based on a growers ability to adhere to the program's recommendations. The various programs have slight variations on this system - in Oregon, the fewer points accumulated, the better the overall score. Let's take botrytis fungicide applications as an example. If a grower sprays more than four applications of a botryticide, he might get a -10, three apps = 15, 2 = 0, one is gets positive points, +10. It encourages growers to lower their total inputs into the system.

I quickly add that the bottom line for all of the programs is that grape quality should not be compromised, nor the economic viability of the farm. Livelihood must be sustainable, and wine quality optimized. It's asking growers to take educated risks in the vineyard, based on knowledge, experience and communication, to grow the best possible grapes with the least impact on the environment. In reality, our best growers are already farming sustainably, so it's not that difficult for other to reach this goal. Grape growers, as a group, tend to be conscientious and well educated about environmental issues. I get calls all the time about sustainable and organic vineyard practices, so the interest is out there to move in this direction.

This is complicated stuff to make work in an industry of independent minds. All of the programs are voluntary. But they may not be forever. The EPA initiated this program and has not said that it will become mandatory. The grape industry on LI does itself a great service by voluntarily developing a plan that looks good politically, environmentally and agriculturally. The only question is, will growers use it? Oregon currently has 2000+ acres (out of 11,000) under LIVE and that number is increasing annually. Other programs in California - Central Coast, Lodi and Sonoma - are also finding wide acceptance among growers. I hope, of course, that the vineyard community will adopt its own sustainable viticulture program in the near future. I will keep you informed about the progress on Long Island and have Alice come to tell us about their program once it is completed. In the meantime, please do whatever you can on your own initiative to lower your off-farm inputs and practice the best and cleanest form of viticulture that you are capable of doing. I am glad to help when it comes to making recommendations. We need to do our part to make the planet a better and healthier place to live. Congratulations to Alice and the grape growers on Long Island for initiating this process for eastern vineyards.

For more information about sustainable viticulture programs, please see these web sites. I would encourage all PA growers to get a copy of the Lodi Grape Growing work book. While not completely pertinent to our viticulture, it has a plethora of useful information. It's a very useful grower guide.



- Oregon LIVE - <http://www.liveinc.org/>
- Central Coast Vineyard Team - <http://www.vineyardteam.org/>

- IOBC - <http://www.iobc-wprs.org/>
- Lodi Wine Growers Association - <http://www.lodiwine.com/>

(Source: *The Grapevine Newsletter*, Spring 2002)

## General

### Soil Management and Cover Crops

*Bruce Bordelon, Purdue University*

Fall is a good time for cultivating fields, adding lime and fertilizer, and planting cover crops in fruit plantings. Cover crops can be an integral part of the orchard floor management plan. If you plan on establishing new orchards or vineyards next year, you should consider a pre-plant soil management program which includes deep subsoiling, soil pH adjustment, addition of fertilizer (especially P and K) according to soil test recommendations, and planting cover crops. Cover cropping a site the year before planting is an excellent

way to increase organic matter and reduce weed problems. Several cover crops are available for fall planting, and mid to late September is the best time to plant in most areas of the state. A favorite among growers is winter rye because it performs very well under Indiana conditions. Rye not only adds large amounts of organic matter to the soil, but also suppresses the development of many annual and perennial weeds. There are several other cover crops and the choice depends on the grower's specific preferences and needs. (Source: *Facts for Fancy Fruit* - 02-11 August 7, 2002)

### Trickle Irrigation During Periods of High Moisture Stress

*John Howell, UMass Extension*

Trickle irrigation has several advantages. Water use can be reduced because less soil is wetted and there is less loss due to evaporation. Once the system is set up, there is little or no pipe to move, reducing labor needs and allowing for timely water application. Also, trickle irrigation lends itself to application of fertilizer. However, with trickle irrigation, water is applied in relatively narrow bands. This causes the crop roots to concentrate in an area that is more restricted than with overhead application. As the plants extract water, the soil dries quickly because the roots are taking water from a small area with limited storage capacity. This requires that water be applied frequently to maintain adequate soil moisture levels. Crops such as squash and pumpkins have leaves covering nearly the entire field, but with trickle irrigation, the roots are taking moisture from a narrow zone. To meet the moisture needs of the crop, the root zone must be constantly moist, but not soggy. Monitor soil moisture in the root zone and apply water before it is depleted. The water demands of the crop and the water holding capacity of the soil will determine the amount and frequency of application. When moisture stress is high it may be necessary to run the trickle

irrigation system every day for up to three or four hours on some soils.

In the long term, you can improve a soil's water holding capacity by increasing organic matter. For each percent organic matter, the soil can hold another 16,000 gallons of water!

That's why soils with high organic matter are more drought resistant. Organic matter increases capillary movement of water in the soil. This improves the horizontal movement of water and increases the width of the bands that are wetted by trickle irrigation. The size of the root zone is increased and there is a greater area from which crops can draw water.

With a restricted root zone there is also less area supplying nutrients to crops. Fertilizers, which are beyond the reach of roots, are not available to crops. It may be necessary to supply more nutrients through the trickle irrigation system to meet the crops needs. As with moisture, nutrient uptake can be enhanced by increasing the width of the wetted area by building soil organic matter. (Source: *UMass Vegetable IPM Newsletter*, August 22, 2002, Vol. 13, No. 17)

### How Farmers can Conserve Water: Short Term and Long Term Options

*S DeGray & R. Hazzard, Adapted from Rutgers Coop. Ext. Org. Farming Edition 8/20/02, with input from D. Johnson, MA. NRCS Office*

Once planted, crops need the right amount of water, at the right times, for successfully harvesting acceptable yields and quality. Water conservation is always a good stewardship practice. However, water management is even more critical during drought emergencies. This

year's drought conditions only serve to emphasize how critical water management is for the success of vegetable farms.

Water should only be used when necessary and in amounts that sustain plant growth without loss of yield. Irrigation system evaluations are always recommended to improve and maintain system efficiency for sustainable crop yields. The following are some assessments and low cost actions farmers can take to conserve water and reduce waste in the short term:

- ☑ Frequently check all system components for visible signs of leaks or damage and make repairs accordingly. Carry out regular maintenance on pumps and power units and evaluate irrigation system efficiency and uniformity by measuring flow rates and pressure.
- ☑ Irrigate in the early morning or evening. Avoid the use of overhead irrigation during the hottest or windy hours of the day.
- ☑ Irrigate less frequently where feasible. This may encourage deeper root system growth - using water from deeper soil layers that would otherwise be lost to deep percolation. (Currently, given shortages of water sources, this may be a necessity, not a choice.)
- ☑ Do not over irrigate. Excess water will run off or percolate beyond the root zone.
- ☑ Take extra caution not to irrigate non-target areas, particularly roads and pavements. Use part circle

sprinklers on field ends or stop the traveler before it reaches the road.

- ☑ Limit water use for non-irrigation purposes.

In the long term, many of the measures that farmers can long-term planning and installing improved irrigation systems, all the way from the water sources to delivery to the crop. These can involve substantial costs. Vegetable growers are eligible for cost-share assistance in irrigation systems from the Natural Resources Conservation Service through their Agricultural Management Assistance program. Cost share for irrigation systems, to offset the risks from drought, is the number one priority for this program. Technical assistance is available for assessing water needs, water sources, and system capacity, as well as in designing a new system. 75% cost share is available for the actual or average costs of wells, irrigation pits, irrigation water conveyance, sprinkler systems, and trickle systems. Incentive payments may also be available for implementing other conservation practices that improve water management. Although the deadline has passed for applications for this fiscal year, NRCS is continuously accepting applications for next fiscal year. Contact your local NRCS field office for more information. (*Source: Vegetable IPM Newsletter, August 22, 2002, Vol. 13, No. 17*)

## APPROXIMATE RUN TIMES FOR SPRINKLER SYSTEMS

*Mary Beth Sorrentino, USDA Natural Res. Conservation Serv.*

During drought, growers must irrigate to supply crop needs, while also conserving water by avoiding runoff and/or deep percolation. This article assists in deciding when to begin irrigation and provides approximate run-times for integrated water management.

### Recommendations for Irrigation Scheduling

- Monitor soil moisture using tensiometers or watermark sensors placed in the crop root zone, or estimate using USDA-NRCS booklet, Estimating Soil Moisture by Feel and Appearance, available from your local NRCS office.

- Start irrigation no later than 50% moisture depletion (Table 3) in the effective root zone depth.
- Available soil water and maximum rates are affected by soil texture. Adjust run time hours listed (Table 1) to apply more or less than 1" application based on soil texture and available water holding capacity. Do not exceed rates in Table 2.

### Irrigation Frequency for 1" Application

- Based on Et rates of 0.2"/day during the peak growing season, and no rainfall, apply 1" every 5 days.

**Table 1.** Rates of application (inches/hr) and hours of run time for a 1" net depth of application at 75% system efficiency. Interpolate run times and application rates for different nozzle flow rates.

<u>Sprinkler Spacing</u>	<u>3GPM/Nozzle</u>	<u>5GPM/Nozzle</u>	<u>10GPM/Nozzle</u>
40'X40'	.18"/hr-7hrs.	.3"/hr-4hrs.	.6"/hr-2hrs.
40'X50'	.14"/hr-9hrs.	.24"/hr-5.5hrs.	.5"/hr-2.5hrs.
40'X60'	.12"/hr-11hrs.	.2"/hr-7hrs.	.4"/hr-3hrs.
50'X50'	.11"/hr-12hrs.	.19"/hr-7hrs.	.38"/hr-3.5hrs.
50'X60'	.09"/hr-15hrs.	.16"/hr-8hrs.	.32"/hr-4hrs.
55'X65'	.08"/hr-17hrs.	.13"/hr-10hrs.	.27"/hr-5hrs.

**Table 2.** Maximum application rates by soil texture. Do not exceed the maximum application rates to avoid runoff and/or deep percolation losses.

Sand	1"/hour
Loamy Sand	.7"/hour
Sandy Loam	.5"/hour
Loam	.4"/hour
Silt Loam	.3"/hour

**Table 3.** Approximate Tensiometer Readings in Centibars (CB) at 50% Moisture Depletion.

Sand	20CB
Loamy Sand	25CB
Sandy Loam	40CB
Loam	65CB
Silt Loam	90CB

(Source: Vegetable IPM Newsletter, August 22, 2002, Vol. 13, No. 17)

## MDFA Inspector Finds Giant Hogweed

*Diane Baedeker Petit, Mass. Dept. of Food and Agric.*

### **Invasive Weed Can Cause Burns, Blindness**

The giant hogweed, an invasive plant on the federal noxious weed list and native to the Caucasus region of central Asia, has been found in several Massachusetts communities. State agriculture inspector Alfred Carl first found the weed on a routine inspection on a farm in Granville. It has since been found in Andover, Blandford, Boston, Colrain, Groton, Huntington, Sutton, Wakefield, Westfield, and Williamsburg.

The giant hogweed can grow to 15 feet tall and the sap can cause severe skin irritation, blisters and swelling and contact with the eyes can cause temporary or permanent blindness.

News stories about the giant hogweed have generated close to 300 calls about possible hogweed sightings. DFA inspectors are following up on the most credible reports.

Photos and more information on the giant hogweed are available on the MDFA web site at [www.mass.gov/dfa/pestalert](http://www.mass.gov/dfa/pestalert). Anyone who believes they have found a giant hogweed plant can report the plant on the Department's web site or by calling the hogweed hotline at 617-626-1779.

"This plant is bad news," says Dr. Craig Hollingsworth of UMass Extension. Hollingsworth coordinates the state's Cooperative Agricultural Pest Survey. "We have been on

the lookout for giant hogweed for a couple of years. It has big seeds and is spread by birds, but the main culprits are gardeners."

The giant hogweed can have up to four-inch stems that have purple splotches and leaves five feet across at its base. It has large umbrella-shaped flowers. A similar related species, cow parsnip, is often mistaken for giant hogweed. Cow parsnip differs in that it reaches a maximum height of six feet and has no purple on its stems.

Brad Mitchell, Director of Regulatory Services for MDFA, is concerned about the potential consequences if this plant becomes as common as other introduced weed pests such as Japanese bamboo or purple loosestrife. Once established, giant hogweed is difficult to control without chemicals, according to Mitchell.

Anyone who decides to cut down the plant should be very careful not to come into contact with the plant fluids. Gloves, long sleeves and pants, and eye protection should be worn.

The giant hogweed was introduced into the United States as an ornamental plant and has become established in New York, Pennsylvania, Oregon and Washington State. Infestations have also been reported in Maine, Michigan and Washington DC, according to the USDA Animal and Plant Health Inspection Service. (Source: *Mass. DFA Farm & Market Report*, Vol. 79, No. 4, August/September 2002)

## Upcoming Meetings

**Wednesday, August 28 from 5 to 7:30 p.m.** at Keown Orchards located at 9 McClellan Road, in Sutton, MA. Features of the tour will include Jane Oliver and Artie Keown's 78-year-old Farm Stand, Farmers' Market and Wholesale operation. Their farm focuses on vegetables and tree fruit, fresh cut flowers, pick-your-own, school tours and special events. Some production techniques include, high density trellised apple orchards, plastic mulch and drip irrigation, and greenhouse season

extension. There will be a tour of the farm looking at the greenhouses, orchards and field grown vegetables. For more information visit the UMass Extension Vegetable Team's website at <http://www.umassvegetable.org/> (follow the links to twilight meetings) or contact: Jonathan Bates, (413) 529-9100 for more information.

## **Annual NAFDMA conference heads south to North Carolina**

An outstanding conference and trade show and warm southern hospitality (and maybe a warm southern winter?) are expected to help draw a record number of attendees to the 2003 North American Farmers' Direct Marketing Conference and Trade Show, to be held Feb. 3-10, 2003, at the Adam's Mark Charlotte in Charlotte, N.C. The conference, sponsored by the North American Farmers' Direct Marketing Association (NAFDMA), was held in Toronto, Ont., Canada, in 2002. Conference organizers are expecting at least 1,000 direct marketers from around the world to attend. For registration information, call Jonathan Bates at (413) 529-0386, e-mail [nafdma@map.com](mailto:nafdma@map.com), or visit [www.nafdma.com](http://www.nafdma.com).

The conference will kick off with its highly anticipated, always full, preconference bus tour from Feb. 3-5. The tour will stop at farms in North Carolina as well as South Carolina. These farms have been carefully chosen to represent the cutting edge of farm direct marketing.

Feb. 6 is reserved for a full day of workshops. Speakers will lead intensive sessions that are sure to stimulate new ideas and boost your bottom line. Eight workshops are available; topics include merchandising, customer service, developing a marketing plan, selling gifts, zoning, school tours, animatronics and farmers' markets. Workshops often fill up, so be sure to reserve your spot early.

Feb. 7 and 8 are dedicated to two general sessions and 35 concurrent conference sessions. This year, eight tracks cover the following topics: farmers' markets, on-farm functions, agri-tourism, specialties, reaching new customers, advanced markets, rural tourism and producing for retail.

A trade show will begin the evening of Feb. 6 and end on Feb. 8. Many companies, including specialty food processors, cookbook publishers and seed companies, have already committed to the show. Visit [www.nafdma.com](http://www.nafdma.com) to view the most recent list of exhibitors. NAFDMA expects to have around 100 premier vendor booths at the trade show.

A post-conference bus tour on Feb. 9 and 10 will round out the conference. The tour will stop at more farm markets, plus local areas of interest.

In addition to all of the educational events, the conference will also offer plenty of opportunities for networking and socializing. Two highlights are NAFDMA Race Night and the annual NAFDMA awards banquet.

Please pre-register to ensure your spot in workshops and to reserve meals and a seat at Race Night and the banquet. Pre-registration is mandatory for the pre-conference bus tour.

Visit [www.nafdma.com](http://www.nafdma.com) for more details.