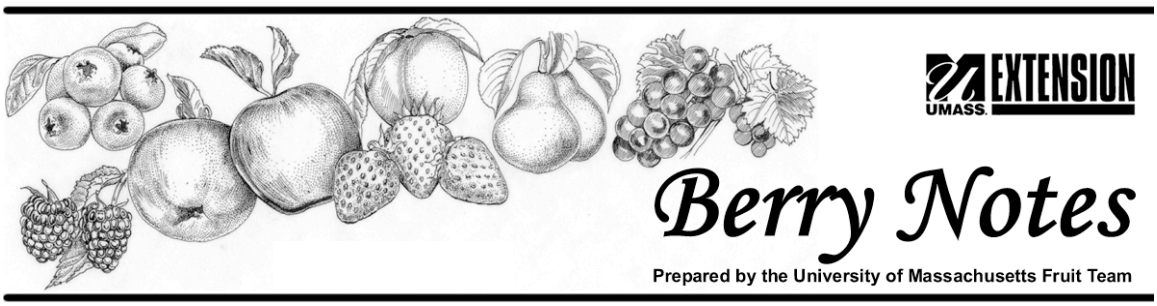


Berry Notes

Prepared by the University of Massachusetts Fruit Team

July 22, 2003, Vol. 15, No. 13 Summer Issue #8
http://www.umass.edu/fruitadvisor/berrynotes/index.html

Volume 15-- 2003

Berry Notes is edited by Sonia Schloemann with articles written by other contributors with attribution; sources are cited. Publication is funded in part by the UMass Extension Agriculture and Landscape Program. Questions can be directed to Sonia Schloemann at 413-545-4347, sgs@umext.umass.edu. Please cite this source if reprinting information that originates here.

Crop Conditions:

Strawberry renovation continues. Keep renovated fields as well as new plantings regularly irrigated. Fertilization is important now. See last weeks Berry Notes for details on the renovation steps. Check new fields for evidence of potato leafhopper burn and evaluate older fields for the level of foliar diseases. This weeks issue contains information on leaf tissue testing which is an important activity after renovation. **Highbush Blueberry** harvest is underway. Send in leaf tissue samples for nutrient testing. This is especially important for blueberries since soil tests are not a reliable check on adequate nutrition. Controlling bird feeding in blueberries is an annual challenge and is discussed in detail below. Also, be sure to keep you blueberries well watered during the coming weeks to help bushes sustain their fruit-load and go into the winter free from water stress. **Summer raspberry** harvest is also underway. Intermittent rain can cause increases in fruitrot during harvest. See below for management recommendations. Be on the look-out for Orange Rust on black raspberries and blackberries. See last week's message for more information on Orange rust and other leaf diseases of raspberries. Also keep an eye out for symptoms of fire-blight in raspberries. **Grape** clusters are sizing up. Scouting for disease and insect levels and taking corrective action are important activities before bunch closure. More on this below. Leaf pulling and cluster thinning are helpful to suppress disease potential. Mite infestations can build up quickly at this time of year. Be sure to check the underside of your leaves. **Currants and Gooseberries** are being harvested. Yields are very good with good quality. Some Gooseberry cultivars have suffered fruit drop from the heat of a couple of weeks ago. Some foliar diseases are evident now and should be controlled. Two-spotted spider mites may also be building up.

Environmental Data

STATE WEATHER SUMMARY For the Week Ending Sunday, July 20, 2003

Prepared by AWIS, Inc. (available at http://www.nass.usda.gov/weather/cpcurr/new-eng-crop-weather)

	AIR TEMPERATURES				PRECIPITATION	
STATE	LO	HI	AVG	DFN	LO	HI
ME	45	88	66	-2	0.00	1.10
NH	39	90	65	-3	0.27	1.86
VT	46	93	66	-2	0.11	1.38
MA	48	89	69	-2	0.07	1.28
RI	56	85	70	-2	0.24	0.74
CT	51	88	69	-3	0.13	1.39

*(**Source**: New England Ag. Statistics Service, Weekly Crop Weather Report, Volume 23, Number14, July 21, 2003)*

Strawberry

Strawberry Update

Sonia Schloemann, UMass Extension

Fertilization: You will be fertilizing your bearing fields with 25-60 lbs. N/acre as part of the renovation process, but new plantings will benefit from a fertilizer application now, too. 30 lbs of actual N per acre is the amount to apply. 200 lbs of 15-15-15 is one possibility, but 90 lbs of ammonium nitrate is fine if you applied P and K at planting. Keep applying N at monthly intervals until you've put on a total of about 100 lbs of actual N.

Leaf Tissue Sampling: Leaf tissue analysis is a way of determining the actual nutritional status of plants. It is an excellent and inexpensive way of finding out if your fertilization program is working or if changes need to be made. The analysis provides information on foliar N, P, K, Ca, Mg, Mn, Fe, Cu, B and Zn levels for the leaves sampled and recommendations for corrective measures if needed. Combined with soil testing, leaf tissue analysis can help pinpoint the source of problems and determine what measures may be needed to ensure proper nutrition of the crop. For strawberries sample from the first fully expanded new leaves after renovation.

Collect 30 - 50 leaves per sample. Sample different varieties separately, if possible. Collect leaves from as many plants as possible in the sample area. Remove the petioles (leaf stems) from the leaves. Gently wash the leaves in tap water to rinse off soil or spray residue. Allow the leaves to air dry until they are brittle before placing into a paper bag. The cost per sample is $18. A check made out to *the University of Massachusetts* must be sent in with the sample. Send sample(s) to the Soil and Plant Tissue Testing Lab, West Experiment Station, Box 38020 UMass, Amherst, MA 01003 or call (413) 545-4768. Test results will be accompanied with recommendations.

Potato leafhopper: Check new plantings now for potato leafhopper (*Empoasca fabae*) damage. Leafhoppers feed primarily on the underside of strawberry leaves, causing them to yellow between the veins and become curled and distorted. Feeding activity is most serious during the late spring and early summer. Leafhoppers are 1/8 inch long, green, bullet-shaped insects that take flight quickly if disturbed. The nymphs are light green and do not fly. Nymphs are easily identified by their habit of moving sideways when disturbed. Insecticides should be applied only when large populations of nymphs are noted on the leaves or symptoms become apparent.

Summer Management of Foliar Diseases of Strawberry

Bill Turechek, Dept. of Plant Pathology, Cornell University, Geneva, NY

In this months issue of the NY Berry News we will cover foliar disease management on strawberry. Foliar diseases are often overlooked because most do not become noticeable until after harvest or renovation. However, serious outbreaks of any of the diseases discussed below can seriously impact the vigor, winter hardiness, and even the production of a planting. At this point, it is not well understood when is the most critical time to manage disease or how much foliar disease can a strawberry planting tolerate. We are currently researching these questions with support from the North American Strawberry Growers Association and the New York IPM Program. Until we have a better understanding, though, we currently work under the assumption that severe infection in the summer (greater than 30% disease) is enough to impact the health of the plant and possibly result in the damage discussed above (this is based on some preliminary work done in my lab). In problem fields, I suspect that one or two well-timed fungicide applications in the summer months may be all that is needed to keep disease from reaching levels that may impact production.

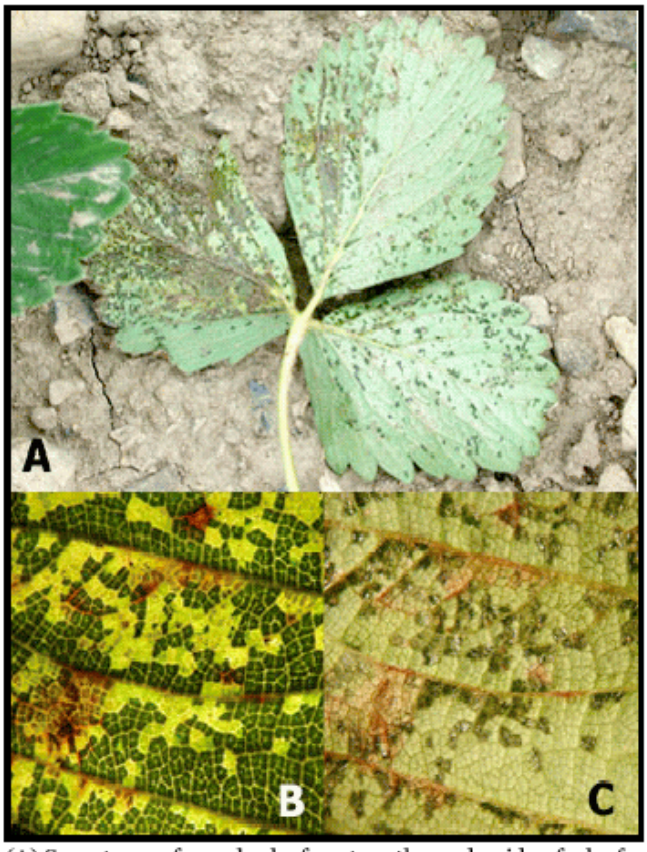
Leaf spot is caused by the fungus *Mycosphaerella fragariae*. It is one of the most common and widespread diseases of cultivated strawberry. It is also the cause of black seed; a disease of the fruit that can occur when warm and wet conditions occur during bloom. Prior to the development of resistant cultivars, leaf spot was the most economically important disease of strawberry. However, since many commercially grown cultivars are not completely resistant to leaf spot, this disease is still significant on a number of cultivars including 'Honeoye', 'Idea', 'Marmolada', 'Raritan', 'Kent'.

Leaf scorch is caused by the fungus *Diplocarpon earlianum*. It is a common disease of strawberry throughout the northeast. Epidemics occur normally from August to October. Leaf scorch can markedly reduce vegetative growth, weakening plants and resulting in a sharp reduction of growth of shoots and roots, a reduction in the number and vigor of crowns, and quite possibly fruit yield. Severely infected plants may die from environmental stresses, such as heat, cold or drought. Like leaf spot, losses vary depending upon cultivar susceptibility.

Leaf blight is caused by the fungus *Phomopsis obscurans*. The disease affects primarily older foliage in late summer and, like leaf scorch, can result in reduced plant vigor and yield in the following season. (It also can cause severe defoliation in nursery production areas in the southeastern US.) Leaf blight is particularly destructive to slow-growing or weak plants. It seldom damages young, runner plants, and rarely attacks the fruit in the Northeast like it does in the South. The spread of *P. obscurans* is favored by frequent rains, overhead irrigation, and heavy dews. Little spread occurs during hot, dry weather in the summer, although symptoms may continue to develop during this period.

Powdery mildew symptoms on underside of leaf. Fruiting bodies of the fungus can be seen towards the end of the summer (right picture).

Powdery mildew is caused by the fungus *Spaerotheca macularis*. Disease severity is most pronounced in areas that experience high humidity and moderate temperatures through the growing season, such as the coastal and Great Lakes regions of the US. Like most of the foliar diseases mentioned, severe outbreaks of powdery mildew can weaken plants leading to an increase in winter-injury and a reduction in yield. The disease has been prevalent after renovation in plantings in Geneva the past few years.



(A) Symptoms of angular leaf spot on the underside of a leaf; (B) as they appear under transmitted light, i.e., leaf held towards the sky; and (C) from reflected light, i.e., leaf looked at from above.

Angular leaf spot is caused by the bacterium *Xanthomonas campestris pv. fragariae*. In New York, it doesn't appear the disease is as widespread as the others addressed so far. The disease severely affects the foliage, and has the potential to attack the calyx (i.e., the sepals on fruit) or the crown of the plant. In planting of Kent in Geneva, the angular leaf spot pathogen was isolated from a number of fruit calyxes showing the symptoms of "brown cap". How prevalent this is across NY, and whether this organism was the primary cause or secondary invader has yet to be determined. Nonetheless, the disease is often left uncontrolled (mainly because there are no real control options) and, seemingly, this has little impact on the planting the following year.

Management of foliar diseases: Once the leaves begin to regrow after renovation, there are a number of options growers have to effectively manage disease.

Nova 40W is labeled for control of leaf spot, leaf blight, and powdery mildew and is a very effective against these diseases; I have not seen data to support its efficacy against

leaf scorch. Applications should begin when disease appears and continue on a 14 to 21 day schedule or, better, when conditions favor disease development. Often, the first application can wait until after harvest. If disease pressure was serious prior to renovation, growers should make a note to consider beginning treatment before renovation next year. If repeated applications are necessary, it is recommended that Nova 40W be alternated with a tank mix of Topsin-M plus Captan.

If anthracnose fruit rot was (or has been) a problem, growers should use a fungicide that also has activity against this disease, such as Captan or Quadris. The fungus is capable of attacking the petioles of young leaves as they emerge after renovation. Fungicide applications at this time serve to protect the leaves from attack and reduce the pathogen population that can overwinter and cause outbreaks next season. Quadris has good activity against anthracnose and powdery mildew. In trials conducted in Ohio, Quadris was shown to have excellent activity against leaf blight as well. Captan will have good to excellent activity against anthracnose as long as coverage is maintained.

Fixed copper products are the only real option for managing angular leaf spot. Copper can be applied on 14-21 day schedule, but growers should be aware that as few as 3 successive applications of copper can result in phytotoxicity on some varieties, quite possibly doing more damage than disease itself. The collective experience of many small fruit pathologists in the Northeast is that treatment is often not necessary, as this disease can appear in epidemic from one year but often not the next.

Lastly, a number of cultural practices can be used to help manage disease. New plantings should be established in sites with light, well-drained soil, with good air circulation and full exposure to the sun. In matted-row systems, runner plants should be carefully spaced when filling rows and the entire planting should be kept free of weeds to improve air circulation and reduce drying time for leaves. Removing and burning all debris at renovation (after harvest) helps to reduce overwintering inoculum of all leaf pathogens. (***Source**: The New York Berry News, Volume 02, Number 07, July 17, 2003*)

Blueberry

The Blueberry Bird Problem: Options for Control

Marvin P. Pritts, Dept. of Horticulture, Cornell University, Ithaca, NY

Birds are a major pest of fruit crops such as cherries, blueberries and some grape varieties. In a recent survey, blueberry growers in the northeastern United States estimated that nearly 30% of their crop is lost to bird depredation. Across the country, 10% of the blueberry crop is probably lost - at a cost of $10 million. Since the loss of Mesurol, no effective chemical repellent has been available. Netting is expensive and difficult to install, so most growers would like to avoid using it if possible.

For the past several years, with the cooperation of Paul Curtis, wildlife management specialist in the Department of Natural Resources, we have been examining the effectiveness of chemical repellents and audio scare devices for birds in blueberries and cherries. What follows is a summary of our experiences with these new technologies.

Chemical repellents. Methyl anthranilate is chemically similar to the major flavor component of Concord grapes, and is manufactured in large quantities by food processors. Birds are repelled by its taste, and since it is generally regarded as safe for human consumption by the FDA, it would seem to be a viable alternative to Mesurol. This product is now registered for use in blueberry plantings (Bird-Shield and Rejex-It). However, we have found several problems with this material. First, it is a volatile compound and has a short residual on exposed fruit. We have found good repellency for about 3 days, but the material loses its effectiveness later. Similar results have been reported from Oregon and Florida. Second, to repel birds, a large amount must be consumed in one bite. It is less effective when applied uniformly as it would be with an air blast sprayer. Although methyl anthranilate works well as a goose repellent in turf, our expectation is that these formulations will not be widely used in fruit plantings until further improvements to the formulation are made.

Sugar. Applications of sugar syrup have been shown to repel birds from blueberry plantings. The exact mechanism of repellency is unknown, but may relate to the inability of many bird species to digest disaccharides. (Most bird-dispersed fruits contain simple monosaccharide sugars.) The sugar is applied when the fruits begin to turn blue, and reapplied after episodes of rain. We dissolved 230 lbs of sugar in 21 gallons of hot water, yielding 40 gallons of solution. Olympic Spreader Sticker was added at 310 ppm. Birds damage was 50% less where sucrose was applied. Although each treatment cost $40 - $50 per acre, and we applied sugar 4 times during the season, the total expense ($160) was far less

than the losses to birds that an adjacent field experienced. In field trials, the sugar also repelled birds, although an increase in Japanese beetles and yellow jackets was observed in treated plots.

Audio scare devices. Distress tapes, cannons and firecrackers are audio devices to which birds rapidly acclimate. They are effective for only short periods of time unless moved regularly and supplemented with visual scare devices.

Recently, a new electronic device named "Bird-Gard" has been developed with digitized, species specific bird distress calls. The device we tested emitted distress calls of crows, robins and starlings every minute during daylight hours. We tested the device in two blueberry fields with high bird pressure, and found it to be effective for about 7 to 10 days. In one field, we added hawk models after a couple of weeks and observed a reduction in feeding. When the device was turned off, feeding increased dramatically. A new version of the Bird-Gard includes a shriek of a hawk prior to the distress calls, and elicits calls randomly. These modifications seem to enhance the effectiveness of the device.

Even though feeding by certain bird species was reduced, many birds still fed in the plantings, especially ground-feeders like sparrows and finches. Because blueberries ripen over such a long period of time, the birds have ample opportunity to habituate to the sounds. Furthermore, species composition changes over time, so sounds that work early in the harvest may not work at the end of the season. One blueberry grower reported that an owl model was very effective for him. The owl mounts on a bearing on top of a post, allowing the owl to swivel in the slightest breeze. In addition, the owl emits a loud shriek at intervals, powered by a solar cell. Combinations of audio and visual scare devices seem to be most effective.

Others. We have surrounded a planting with strobe lights, but found they were not effective. We also tested "Bye-Bye Birdie" - a device from Japan that looks like a bird, but contains a powerful magnet purported to disrupt the natural sense of direction of birds, which they purportedly avoid for distances up to 70 ft. After hanging many of these magnets over a blueberry field, we found them to be ineffective. In addition, we tested a special machine that laid out a sprayable "biodegradable" netting. It is effective on vegetable crops for insect control, and seemed to have potential for blueberries as well. However, the application was too slow and likely to be uneconomical.

Bottom line: Combinations of visual and audio scare devices with taste deterrents are the most practical substitute for netting at this time. (***Source****: The New York Berry News, Volume 02, Number 07, July 17, 2003*)

Determining When To Irrigate Highbush Blueberry

Elsa Sánchez and Kathy Demchak, PennState University

The amount of water supplied to blueberry plants influences vegetative growth, fruit size and quality. Supplemental irrigation is almost always needed for maximal yields even in years of plentiful rainfall because rain events occur irregularly resulting in periods of drought during the growing season. In addition, the nature of the root system makes the plants sensitive to moisture fluctuations.

The distribution of the blueberry root system is dependent on the age of the plant and climactic and soil conditions. In general, blueberry plants have shallow root systems with the majority of the roots 8 to 12 inches deep in the soil and rarely deeper than 16 inches. Most of the roots, 90%, are located within the dripline of the blueberry canopy.

Root systems of highbush blueberry plants are composed primarily of very thin roots. Roots can be up to 0.04 inch in diameter, however most are 0.02 to 0.03 inches in diameter, about the thinness of a strand of hair. Blueberry roots lack root hairs that are used in other plants for mining the soil for water and nutrients. Instead, blueberry roots have formed a unique association with endomycorrhizal fungi. The fungi inhabit blueberry root cells and facilitate water and nutrient (especially nitrogen and phosphorous) uptake for the blueberry plant, essentially acting as root hairs. In return, the fungi use carbohydrates from the plant for nourishment. Endomycorrhizal fungi survival is jeopardized in production systems using extensive inorganic fertilizers and cultivation. In this situation the roots can be less efficient at water and nutrient uptake.

The following example will help determine the need for supplemental irrigation in various situations. First, determine the available water holding capacity of the root zone. Ascertain the soil texture of the site and use a rooting depth of 16 inches, multiply the rooting depth by the available water holding capacity (from the table below) to determine the available water holding capacity of the root zone. For example, a clay loam soil would have an available water holding capacity of 2.24 inches of water (0.14 inch of water per inch of soil multiplied by 16 inches of soil). The water held in the root zone should not drop below 50% of capacity to avoid moisture stress to the plants. In this example the amount of available water should not drop below 1.12 inches of water held in the root zone.

Table 1. Available water holding capacity based on soil texture.

Soil Texture	Water Holding Capacity (in. of water /in. of soil)
Course sand	***0.02 - 0.06***
Fine sand	***0.04 - 0.09***
Loamy sand	***0.06 - 0.12***
Sandy loam	***0.11 - 0.15***
Fine sandy loam	***0.14 - 0.18***
Loam and silt loam	***0.17 - 0.23***
Clay loam/silty clay loam	***0.14 - 0.21***
Silty clay and clay	***0.13 - 0.18***

Source: *Commercial Vegetable Production Recommendations Pennsylvania 2003*.

Table 2. Monthly average potential evapo-transpiration or peak use rate of water demand for July and August at various locations in New York.

Location	Average Peak Use Rate (inches/day)
Albany	***0.20***
Binghamton	***0.17***
Buffalo	***0.22***
New York	***0.23***
Rochester	***0.21***
Syracuse	***0.21***

Source: Pritts, M.P. and J.F. Hancock, 1992.

The next piece of information needed is how much water the plant uses a day or the average peak use rate. In New York, the average peak use rate varies from 0.17 to 0.23 inches per day (see the table below). A blueberry plant in Buffalo in July can be using up to 0.22 inches of water per day. With 1.12 inches of water easily available to use and no other water supplied, the plant will use 1.12 inches of water in about 5 days (1.12 inches of water divided by 0.22 inches of water per day equals 5.09 days). The daily peak values are averages and can be up to 25% higher.

Several methods exist to determine when to irrigate. One is the 'checkbook' or water budget method, which uses the water holding capacity of the soil (described above). To use this method, determine the plant water use and the amount of rainfall daily. Subtract the daily plant water use and add the daily amount of rainfall to the available water holding capacity of the soil. Irrigate the plants when the available water holding capacity of the soil drops to 50% of capacity. Soil moisture content should be checked periodically to verify water use and availability.

Another method is to assume that blueberry plants need about 1 - 2 inches of water per week depending on the growth stage of the plant. Two inches may be supplied from the period of fruit expansion to harvest. Irrigate the plants when rainfall does not meet the plant demand water in a given week. This method is less precise than the water budget method. As with the water budget method, soil moisture content should be checked periodically to verify water use and availability. (***Source**: Fruit Times, 2003, Vol. 22, No. 11*)

References:

1. Bowling, B.L. 2000. The Berry Grower's Companion. Timber Press, OR.
2. Commercial Vegetable Production Recommendations for Pennsylvania 2003.
3. Demchak, K. (Coordinator). 2002. Commercial Berry Production and Pest Management Guide 2002-04. Pennsylvania State University. Extension publication CAT AGRS-53.
4. Galletta, G.J. and G. Himelrick (Eds). 1990. Small Fruit Crop Management. Prentice-Hall, Inc, NJ.
5. Pritts, M.P. and J.F. Hancock (Eds). 1992. Highbush Blueberry Production Guide. Northeast Regional Agricultural Engineering Service Publication NRAES-55.

Raspberry

Ontario Raspberry Update

Pam Fisher, Ontario Ministry of Agriculture and Food

Raspberry harvest is underway starting with Prelude last week in the Simcoe area, and now Boyne, Killarney, Nova and Reveille. White druplet disorder has already been observed at one site. White druplet disorder is a physiological problem, not a disease, caused by excessive heat and UV radiation.

Figure 1. White druplet disorder is common on some varieties after very hot sunny weather.

Botrytis grey mould is already showing up on raspberry fruit. The first signs are usually associated with dried up druplets or damaged fruit.

Figure 2. Botrytis starting to show up on fruit. These druplets may have been damaged by Botrytis at bloom time, or by insect feeding.

Although the best time to control Botrytis is at bloom, Elevate 50DG, or Rovral 50 WP can be applied now to help suppress control Botrytis grey mould. Both have a 1-day to harvest period, which means no harvest for at least 24 hours after application.

Raspberry canes continue to die back, especially the canes that were yellow and weak to start with. These canes were injured during the winter, and so only some of the required nutrients and water are getting through to the leaves and fruit. Eventually the plant collapses and dies. Hot weather and drought stress is also very hard on raspberries. Be sure that adequate irrigation is used to supplement rainfall. Raspberries need 1-2 inches of water per week during green fruit and early harvest. (***Source**: Ontario Berry Bulletin for July 17, 2003*)

Battling Botrytis in Fall Raspberries

Annemiek Schilder, Michigan State University

Botrytis gray mold, caused by the fungus *Botrytis cinerea*, is one of the most important diseases affecting fall raspberries. Fall raspberries are usually at greater risk of infection than summer raspberries because of the prevailing weather conditions, such as lower temperatures, heavy dews and frequent precipitation. Cool, wet weather is conducive to development of the fungus and infection of the fruit. If the weather remains similar to what it has been, Botrytis will be problematic in raspberries this year.

Symptoms

Typical symptoms include a brown discoloration of the fruit and the presence of a gray fuzzy mold, which can rapidly develop and spread to neighboring healthy berries. Symptoms tend to be more severe inside the canopy and on clusters that are closer to the ground. Even if berries look perfectly healthy at harvest, they can change to a moldy mass within 24 to 48 hours.

Biology of the fungus

Botrytis cinerea is a ubiquitous fungus, which is able to grow and sporulate profusely on dead organic matter. It overwinters in old infected canes and plant debris. The spores are airborne and can travel long distances in the wind. When the spores land on plant surfaces, they germinate and can invade the plant tissues directly or through wounds. Production of spores and infection are favored by prolonged periods of wetness or high humidity and moderate temperatures (60-75ºF). When wet conditions prevail during the bloom period, withering flower parts may become infected by the fungus and lead to latent infections of the young berries. Such infections become active as the berries ripen. Overripe berries and bruised berries are particularly susceptible to infection.

Control

Cultural methods are very important for control of Botrytis gray mold. Choosing a site with good airflow can reduce humidity in the canopy considerably. Low-density plantings/narrow rows and trellising can also reduce a buildup of humidity. Good weed control and moderate use of fertilizer to avoid lush growth are also important. Selecting a resistant cultivar or, at a minimum, avoiding highly susceptible cultivars will help to reduce the need for control measures. During picking, avoid handling infected berries, since spores can be transferred on hands to healthy berries. Timely harvesting and rapid post-harvest cooling can also help to reduce losses to Botrytis gray mold. Several fungicides are labeled for control of Botrytis in raspberries. Fungicide sprays during bloom are important to prevent pre-harvest infections, while post-harvest infections can be reduced by spraying close to harvest.

Several efficacious fungicides are available: Elevate (fenhexamid) is a reduced-risk fungicide with locally systemic properties. It has a 0-day PHI and provides good control of pre- and post-harvest gray mold. Switch (cyprodinil and fludioxonil) is a recently registered fungicide with protectant and systemic properties. It has also performed well in raspberry trials in Michigan. Switch has a 0-day PHI. A maximum of four sprays (and two consecutive sprays) is allowed for both Switch and Elevate. Switch and Elevate are in different chemical classes and may be alternated with each other or with Captan [not in MA], Rovral, or Nova to reduce the risk of resistance development. *(**Source**: Michigan Fruit Crop Advisory Team Alert, Vol. 18, No. 13, July 15, 2003*)

Use of Switch Fungicide on Brambles

Mike Ellis, Ohio State University

Switch Fungicide is registered for use on all brambles (black and red raspberries and blackberries) for control of Botrytis fruit rot (gray mold). Our results show that it provides excellent control. It is important to point out that this is a recent registration, and the product that is purchased this season does not list brambles on the label. It is legal to use Switch on brambles in Ohio, but you need to have a copy of the supplemental label with you when you use it. You can contact me for a label or you can download one from your computer from the following address: www.cdms.net/pfa/lupdatemsg.asp. My email is Ellis.7@osu.edu. Phone: 330-263-3849. (***Source**: Ohio Fruit ICM News, Volume 7, Issue 27, July 18, 2003*)

Grape

Mid-Season Grape Insect Update

Rufus Isaacs, Michigan State University

Grape berry moth

Pheromone trap captures of moths in Berrien and Van Buren counties are down to low levels this week showing that the first flight of grape berry moth is finally tailing off. At the same time, egg laying has dropped to very low levels. There was a long period of egg laying during the first generation of this pest this year, and post-bloom control programs may not have adequately protected against the drawn-out development of the first generation. Larvae that survived from earlier egg laying can be found in some high pressure vineyards now, and can be easily scouted for by looking in clusters, particularly on vineyard borders near woods. The premature reddening of Concord clusters where larvae have entered the fruit is a clear sign of infestation, and this can be used to determine the level of grape berry moth infestation. A more thorough scouting is needed in Niagaras since there is no color change after larvae enter berries of this variety.

In the next few weeks, we expect the second flight of grape berry moth to begin. In vineyards with a history of this pest, a well-timed insecticide targeted against this next generation can help to reduce the risk of berry moth infestation at harvest. The best way to know whether a vineyard requires this mid-season spray, and when to apply it, is to scout the vines for the start of egg laying or early berry infestation by larvae. This scouting can only be done by regularly looking at clusters on the vineyard border and on the vineyard interior and determining the level of pressure from this pest.

A third grape IPM meeting will be held on July 23 in Van Buren County in the morning and in Berrien County in the afternoon. Contact your local extension agent or National Grape representative for details.

Leafhoppers

Populations of grape leafhopper are increasingly evident now that the nymphs are growing. This pest can be scouted for in the next few weeks at the same time as the grape berry moth scouting described above, by looking on the underside of leaves. Many grape berry moth targeted sprays will also control grape leafhopper, though there are pockets of Sevin resistance in this pest in some area. Intrepid will not have any effect on leafhoppers, and Provado at the 1 oz rate is an excellent leafhopper-specific control option.

Potato leafhopper has been blown into Michigan on storm fronts and is at high levels in some vineyards, while others have none. This leafhopper differs from grape leafhopper in that it is bright green and moves sideways when disturbed. It is less common in juice grape vineyards, and is more of a pest in vinifera and hybrid vines that are sensitive to its feeding. These vines may show leaf cupping, discoloration and shortened internodes on shoots with potato leafhopper feeding.

Japanese beetle
This pest has started to emerge and is eating grape foliage. Juice grape vines are most resistant to this pest, and can withstand significant loss of leaf area before there is any effect on vine growth or fruit quality. However, management is more important for vinifera and hybrid vines that have thinner leaves, and that have a lower leaf to fruit ratio. Many of the insecticides that might be sprayed for grape berry moth will also control beetles, though not Intrepid. (***Source:*** *Michigan Fruit Crop Advisory Team Alert, Vol. 18, No. 13, July 15, 2003*)

Scouting the Vineyard Will Guide Your Decisions

James W. Travis, PennState University

Scouting the vineyard for diseases is always important but at this time of the season it is especially critical to discern the level and intensity of the fungicide spray program that is still needed in the vineyard. How do you know whether to keep up an intensive spray program up or rely on broad-spectrum (less expensive) materials at extended intervals? Is it time to extend spray intervals a little? Is a targeted fungicide application needed? For example, do you need to apply a fungicide effective on Botrytis bunch rot before bunch closure? How effective has your powdery mildew control program been? Is there powdery mildew in the clusters? If there was some early season downy mildew, is it still sporulating which will spread the disease?

Some Practical Suggestions for Scouting the Vineyard

How

1. Scouting cannot be effectively accomplished from the seat of the tractor or while you are managing the canopy. Scouting requires focused time to carefully search the clusters and leaves in the thickest part of the canopy. Be especially careful to turn clusters over and move shoots and leaves aside to examine what is going on beyond plain view.
2. Select rows and vines at random to scout. As a workable rule-of-thumb for growers you will want to scout at least 5% of the vines. If you have 800 vines per acre then you would scout 40 vines at random in the acre. An easy way to accomplish this is to select 10 post lengths in different parts of the vineyard. You can scout 10 post lengths from each side of the row or you can scout 20 post lengths from different sides of the row. Whatever, scheme you use be certain to scout including both sides of the row since diseases often occur more on one side of the row than the other. Scout all 4 vines between the posts. Don't select end rows or end vines to scout since they are not often representative of the vineyard as a whole.
3. Keep a record of what you find for all 10 of the post lengths. You don't need to keep individual vine records (unless you want the detail). Scouting is for your information to help you make decisions. You can count 5 shoots per vine and record the number of shoots with disease on the leaves and clusters. Or, you don't need to "count". Just observe what you see. Do you see powdery mildew on the clusters? You can estimate the number of infected clusters or percentage of infected clusters. You decide the detail. What is most helpful to your decision-making? Generally, it is good to know if there is a little disease in the canopy or if there is a lot. Is there powdery mildew on the leaves but the fruit look clean? This record will also be helpful in planning next years disease control program. You will be able to identify the trouble spots and take appropriate actions. Fungicides aren't cheap. You will be able to use them wisely and only when necessary. The scouting record should have the date, variety, number of vines scouted per block. For each block record the observations for each of the post lengths examined (ex. 1-10). The results can be as simple as, a little powdery mildew on clusters & leaves, no black rot or downy, Botrytis infected berry in 3 clusters. Or a table with Powdery Mildew 3/20 clusters, 5/20 shoots, Phomopsis 2/20 shoots, Botrytis 3/20 cluster etc. Write something down. You may think you will remember next year but you won't.

How Long

4. Time - It requires a minimum of 30 to 45 minutes per acre (30 to 40 vines, 1 minute per vine) to scout a vineyard if you keep moving and stay focused. If it takes you less time than this to scout you have not spent enough time to have accurate information.

What

5. Each variety should be scouted since each variety has its own spectrum of disease susceptibilities.
6. Larger areas of the same variety (more than an acre) and areas that have different growing conditions due to various factors such as trellis type, soil type, slope, exposure, border (woods) etc should be individually scouted.

Where and What

7. What to look for during scouting from pea-size fruit stage until veraison.
    a. Phomopsis Leaves at the base of the shoot will have lesions that will look like pinpoint dark spots and the leaves may be distorted. The base of the shoot will have dark lines or a generally scabby appearance.
    b. Black rot lesions are very distinctive. Leaf lesions are often round to oval about the size of the diameter of a pencil eraser (some smaller, some larger) and always have very small dark specks in the center. The lesions on the shoots that occur in the area of leaf lesions are similar in description except they are ovals that are formed along the shoot surface. Infected black rot fruit have brown spots on individual berries or the entire berry is shriveled and black.
    c. Downy mildew appears on the leaf as yellow to brown spots on the upper surface of the leaf and when the leaf is turned over the area of the spot is white (if the downy is still sporualting producing new spores to spread). It is important to note whether the downy spots are still white underneath which indicates the disease can still spread. If effective fungicides were applied the lesions may no longer be active (no white downy growth on the underside of the leaf). Infected berries will appear white and "moldy", with berries often turning brown to black.
    d. Powdery Mildew can be observed on the portion of the berry closest to the center of the cluster. It will appear as a very fine white to gray covering on the berry. The cluster stem can also be infected and show the same symptom. Leaves infected with powdery mildew have patches of white "powdery" growth usually on the upper surface of the leaf.
    e. Botrytis occurs at this time of the season in clusters usually as individually infected berries. The infected berries are brown and often tucked tightly in the cluster between healthy berries or a few berries that are becoming diseased (turning brown). There may or may not be gray mold growing on the berries.

How to interpret what you observe from scouting.

Dry weather conditions reduce the potential for infection and spread of many of the grape diseases. If disease is present in the canopy from early season infections, increase and spread of the disease can occur from occasional thundershowers. Fungicide rates and timings will have to be maintained to prevent significant crop loss. However, if there is little or no disease in the vineyard, routine fungicide applications of a protectant fungicide (captan, ziram, carbamate) and sulfur is all that is needed until veraison.

Phomopsis, Black Rot. Both of these diseases did their damage earlier in the season. For most grape varieties berry susceptibility to both of these diseases decreases rapidly after pea-size fruit. Phomopsis infected fruit will not become apparent until closer to veraison and will appear like a 'sudden' out-break of black rot. Phomopsis and Black Rot both produce brown berry lesions and black shriveled mummies. Phomopsis fruit infections occur early in the season and remain latent until the fruit begins to ripen. Fruit rot of Phomopsis and black rot are very difficult to distinguish except that black rot fruit rot often occurs earlier in the season and Phomopsis does not become obvious until fruit begins ripening. Record your observations to plan next seasons early season disease management program.

Powdery mildew. Many grape varieties become much less susceptible to berry infection shortly after the pea-size fruit stage is reached. Some highly susceptible vinifera varieties continue to have susceptible berries until veraison. Research at Cornell has shown that late season berry infection by powdery mildew may be linked to Botrytis outbreaks before harvest. It is good to keep some powdery mildew control in the vineyard. If disease levels are low, sulfur or one of the alternative fungicides may be all that is needed to keep it in check. Don't let late season powdery mildew get out-of-hand (high levels of disease on the leaves) since if will provide an abundance of inoculum for the over-wintering of powdery mildew.

Botrytis. This is one of the most important records from your current scouting activity. It is important to know if there is no Botrytis in the vineyard, if there is an occasional infected berry or if infected berries can be found throughout the vineyard. Botrytis can explode into an epidemic if there is just a little disease and the right weather conditions as the fruit begin to ripen at veraison. As a grower you have only a limited number of opportunities to impact the outbreak of Botrytis in your vineyard. There a very few effective Botrytis fungicides and resistance is a real risk. If you found some infected Botrytis berries during the scouting process, I would recommend an application of one of the three fungicides (Vangard, Rovral or Elevate) before bunch closure. This is your last opportunity to get some fungicide inside the cluster where Botrytis is most likely to begin. But you don't want to apply a fungicide if it is not necessary since each time th fungicide is applied you are one step closer to fungicide resistance. A "few" infected berries now will supply more than enough disease inoculum to spread Botrytis from veraison to harvest if extended wet conditions occur. Conduct another

"focused" Botrytis scouting during early veraison to determine if additional fungicide applications for Botrytis will be required at veraison and even pre-harvest. Direct Botrytis fungicide sprays at the clusters. Your need to spray for Botrytis the remainder of the season will depend on, the level of Botrytis in the vineyard, and weather conditions. Removal of leaves around clusters will significantly reduce the potential for Botrytis development in the clusters.

Downy Mildew. This disease can continue to spread even after harvest. Warm temperatures and hard rain showers favor it. Fruit infections that occur during early fruit development are observed now as 'downy' white mold on brown to black berries. If effective fungicides were applied lesions may no longer to sporulating (no white growth on the under side of the lesion) and the risk for downy mildew spread maybe greatly reduced. However, if downy mildew is still sporulating on leaves and/or fruit there is a continued risk of disease spread. The potential for direct fruit infection is reduced at this period of the season but infections may occur on the rachis and spread into the fruit. Captan and Ziram will have a suppressing effect on downy mildew.

The Decision to Scout the Vineyard

There is not a practice in the vineyard that you have on your "to do" list that is more important than scouting at this time of the season. Other routine practices will have an impact on the crop quality and yield but not as much as scouting for disease on the grapes. If you have not thoroughly scouted the vineyard, you are managing the vineyard blind. You risk disease on the crop at harvest or spending too much on fungicides or both. (***Source**: PA Grape Newsletter, July 21, 2003*)

Powdery Mildew Refresher

Wayne Wilcox and Alice Wise, Cornell University

Now that we are well past fruit set, our attention turns to summer disease control, primarily downy and powdery mildew (PM). In his April presentation on Long Island and in his annual Grape Disease Control paper, Wayne Wilcox reviewed some of the finer points of powdery mildew control.

1. Cleistothecia on leaves, the little gray-black fruiting bodies that develop on a leaf with PM, are responsible for "carry-over" of the disease from one season to the next. Their quantity is directly related to the amount of disease that forms on the leaves during the summer and early fall. So, the best way to reduce disease pressure at the start of next year is to get good control throughout this year.
2. Powdery mildew functions as a "compound interest" disease, that is a few infections on leaves and clusters can explode into an epidemic if conditions are favorable. Treat any appearance of PM seriously, use a post-infection treatment as soon as feasible.
3. In CA, PM overwinters in infected buds which in turn produce flag shoots (shoots covered with PM soon after budbreak) the following spring. This does not appear to occur normally on LI, presumably due to our relatively cold winters. However, it is something we should be aware of and look for in the spring, especially after abnormally warm winters.
4. Over 90˚F, the PM fungus is inactive. This is the basis for PM prediction models in CA where >90˚F is achieved for a large part of the summer. Mid 60's to mid 80's is ideal for infection, thus virtually every day in the summer is a high pressure PM day on LI. Extended periods with warm, balmy nights cause extreme pressure, since this favors the fungus for 24 hrs a day.
5. Unlike other fungi, PM does not need rain to cause infection. Although it is favored by high humidities (optimum RH is 85%), humidity is not nearly as important as temperature.
6. Realizing that most vineyard managers have a chaotic schedule right now, attempt to leaf pull sooner rather than later to improve spray coverage and airflow through the cluster zone.
7. Speaking of clusters, clusters infected with PM, even very low levels, are much more susceptible to cluster rot. These so called "diffuse infections" occur on berries from early fruit set through cluster closing, after which susceptibility of berries to PM, DM and BR drops precipitously.
8. Use caution with Nova and other sterol inhibitors – other eastern grape regions, including the Finger Lakes and Ontario, have seen resistance problems with these materials. Ditto for California and many parts of Europe. Wilcox "would be surprised" if these materials weren't starting to "slip" in at least some LI vineyards as well. Nova has been registered for quite a while now, use vigilance when using it (or Rubigan or Elite) alone, or tank mix with sulfur or other PM material. There have been reports from France that tank mixing sterol inhibitors with sulfur will reduce their activity. Wilcox was somewhat skeptical about this study, and feels that the insurance provided by the sulfur outweighs this possible risk.

9. As far as the strobies, Abound is not as effective as Sovran is not as effective as Flint. If using Abound in particular, include a PM material such as sulfur (at the research vineyard, we've used Abound for its black rot and downy control and tank mixed 3 lbs./a of a DF sulfur). Flint alone has the ability to vaporize, providing some control to nearby uncovered plant surfaces.
10. Stretching intervals with the strobies could be a recipe for disaster. The Flint label, for example, has a recommendation for stretching the high rate of 2 oz/a to a 21-day interval. This is not a good idea. As a rule of thumb, shoot for 10 days, which means when rain, equipment breakdowns, schedule conflicts and so on arise, hopefully no more than 12 days, maybe 14, have passed.
11. Sulfur is still the "old standby" for PM control. Advantages – not resistance prone, relatively inexpensive, vaporization of sulfur will provide some control to nearby plant surfaces without coverage. Disadvantages – smelly, shorter period of control (up to 14 days with a liquid or DF formulation, good coverage and no heavy rainfalls), potentially phytotoxic when conditions are hot, can't be tank mixed or applied within a certain time period with certain materials such as JMS Stylet Oil.
12. Of the "alternative" PM materials – JMS Stylet Oil, Nutrol (monopotassium phosphate), Kaligreen, Armicarb (both potassium bicarbonate), Oxidate (hydrogen peroxide) and Serenade (Bacillus subtilis strain), only Stylet Oil has consistently provided acceptable control. Stylet Oil has both advantages and disadvantages.

(***Source**: Long Island Fruit & Vegetable Update, No 18, July 18, 2003*)

A Pocket Guide for Grape IPM Scouting in the North Central and Eastern U.S., is now available from Michigan State University

This plastic-coated scouting guide with 3.25-inch by 5-inch pages fits in your pocket for easy reference in the vineyard. With color pictures and descriptions, it will help you identify common insect and disease pests and the damage they cause as well as natural enemies. Some guidelines for monitoring and thresholds are included. There is also a section on various injuries from abiotic conditions, nutrient deficiencies, and herbicides.

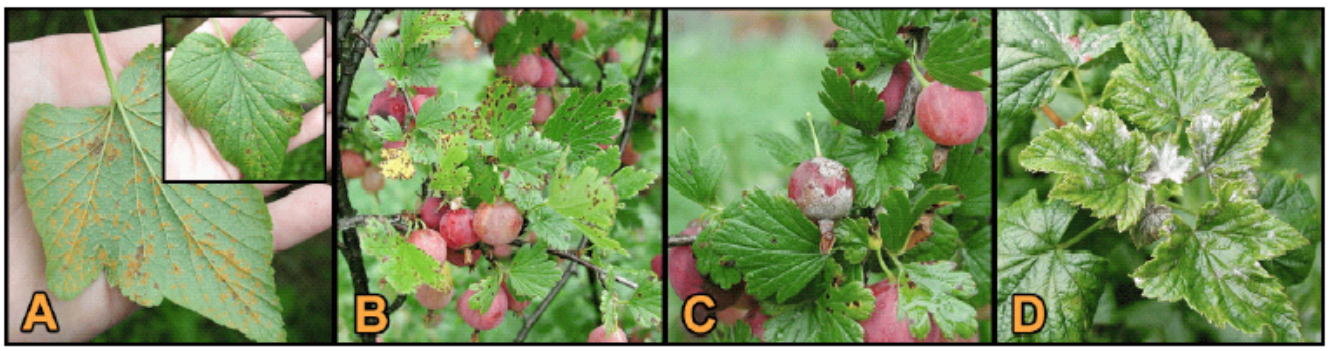
This $13, 112-page guide is intended to be a field supplement to more comprehensive reference publications and does not include pesticide recommendations. To view sample pages and further description of the guide, visit the publication section of the MSU IPM Program website at: http://www.ipm.msu.edu; or for information on ordering go to: http://www.ipm.msu.edu/pdf/grapeGuide.PDF

Currants and Gooseberries

Managing Diseases of Currant and Gooseberry

Bill Turechek, Cornell University

On our tour in PA, several important diseases were evident in established currant and gooseberry plantings. Leaf spot (Fig. B), also known as anthracnose (*Drepanopeziza ribis*), was widely seen on gooseberry. White pine blister rust (*Cronartium ribicola*) was found on susceptible black currant varieties such as 'Ben Alder' and 'Ben Nevis' (Fig A). When the disease is severe, these varieties can be completely defoliated by August leading to winter-killed bushes due to lack of hardening. Powdery mildew (*Spaerotheca mors-uvae*), or as it is sometimes referred to as American mildew, was quite obvious on gooseberry and black currant, and is a disease that must be managed every year if resistant varieties are not used (Fig. C and D).



In New York, there are several fungicides labeled for use on *Ribes* spp. (see Table). Beyond label recommendations, we have little practical experience with how well these fungicides work against the diseases discussed and when applications should be timed to achieve the best control. I will draw upon my experience with working with these fungicides on other crops to manage similar diseases, plus conversations with Steve Mckay of Cornell Cooperative Extension, to derive a best guess on how they may fare on currant and gooseberry. Steve and I are currently working together to evaluate the efficacy of several fungicides to control diseases on *Ribes*, including several of the most recently labeled, in an experimental planting of currant and gooseberry planted at the NYS Ag Experiment Station in Geneva, NY this spring. Although we may be able to get some preliminary information from this planting this year, it will take an additional two years before the planting is developed enough and has sufficient disease pressure to run truly challenging fungicide trials.

Starting from the beginning of the season, typical spray programs for disease management include a dormant application of copper hydroxide or lime sulfur targeted at reducing the overwintering population of leaf spot (anthracnose) and powdery mildew. Prebloom applications of copper or wettable sulfur beginning just before bloom and continuing on 7-10 interval or on an "as needed" basis are typical for managing anthracnose. Season-long schedules are often necessary in New York because the labeled fungicides are only moderately effective at controlling anthracnose, especially on the most susceptible varieties. However, this use pattern can and often results in phytotoxicity, so pay careful attention to your plants when several consecutive applications are made.

For powdery mildew, Nova can be applied at the first sign of symptoms or, in problematic plantings, beginning at prebloom, followed by an application at bloom, then by 2 additional applications at 14 day intervals. Nova is also registered for control of leaf spot and is thought to be moderately effective. Potassium bicarbonate (e.g., Kaligreen) is another option for powdery mildew control, but it is generally applied to knock back existing colonies in a rotational program with other fungicides. Oils and sulfur may also be used against powdery mildew, but they can not be mixed in the same spray tank or be applied close to each other in a spray schedule due to phytotoxic effects. Furthermore, some gooseberry varieties are "sulfur shy" and cannot tolerate the use of sulfur and excessive applications of oil may delay ripening. Only oils are labeled for control of rusts. However, if Nova is used to target powdery mildew, reasonable control of rust might be attained. Nova is very effective at controlling rust on apples and is labeled for the control of rust on blackberry and raspberry.

Fungicide	Labeled Against
Abound 2.08F	**None on label**
Copper (e.g., Kocide 2000)	**Leaf spot**
Elevate 50WDG	**Gray mold**
JMS Stylet Oil	**Powdery mildew, white pine blister rust**
Nova 40W	**Leaf spot, anthracnose**
Potassium bicarbonate (e.g., Kaligreen)	**Powdery mildew**
Rovral 4F	**Gray mold**
Sulfur	**Powdery mildew**
Switch 62.5WG	**Gray mold**

Abound, Elevate, and Switch are the most recent fungicides labeled on Ribes. Along with Rovral, Elevate and Switch are mainly active against gray mold (*Botrytis cinerea*); this does not appear to be the most serious on Ribes spp. Abound could very well be effective against all the diseases of concern. Abound is known to have good activity against a variety of leaf spotting pathogens, good to excellent activity against many powdery mildews, and fair to good activity against certain rust diseases. However, the Abound label does not list any disease of currant or gooseberry. In New York, it is prohibited to apply any fungicide against a non-target pest (i.e., one that is not on the label) without a 2(ee) recommendation, or in a use pattern inconsistent with its labeling. So, according to the NYDEC, unless a 2(ee) recommendation for a specific disease is submitted (and anybody can do this) or Syngenta expands their label, Abound can not be applied. (I have spoken with the folks at Syngenta and brought this to their attention). (***Source****: The New York Berry News, Volume 02, Number 07, July 17, 2003*)

General Information

Foliar Nutrient Analysis

Marvin Pritts, Cornell University [MA notes in brackets]

Plant tissue analysis is used to measure directly the amount of nutrients in various plant parts, and for established perennial crops, is usually a better indicator of nutrient status than a soil test. Recommendations are based on the levels of 13 essential nutrients in your leaves at a specific time of the year (usually mid-summer). Unlike visual diagnoses, foliar nutrient analysis can alert the grower when nutrient levels are approaching deficiency so corrective action can be taken before problems occur. They also alert the grower if fertilizer is being over-applied. Unlike soil tests, foliar analysis provides accurate results for all essential mineral nutrients, not just for the 4 or 5 reported in soil tests.

For strawberries, recommendations are based on newly expanded leaves collected after renovation in late July or early August. Other sampling times or plant parts may prove to be more appropriate for certain nutrients, but until more detailed studies are done, foliar samples collected in mid-summer are the standard because nutrient levels fluctuate little then. For raspberries, select fully expanded primocane leaves in early August. For blueberries, select young leaves exposed to full sun in late July.

Collect at least 50 leaves, remove their petioles, and wash them in distilled water. Dry them, place them in a paper bag, and send them to the laboratory for analysis. Samples should be representative of the entire field. If a particular area of the field looks poor or has been fertilized differently from the rest, sample it separately.

A leaf analysis, including nitrogen, costs $28 [$18 in MA]. Results should return from the lab within 2 - 3 weeks. Many nutrients can be applied in fall, and the recommendations will provide details on when to apply particular nutrient fertilizers and in what quantities. The leaf analysis is accurate only if the soil pH is within an acceptable range (5.5 - 7.0 for raspberries and strawberries; 4.0 - 5.0 for blueberries).

Conduct a foliar tissue analysis every other year. The soil pH should be monitored regularly, and a complete soil test performed every three years. Always be alert for any unusual appearance of leaves, and for unexplained reductions in growth or yield. Sampling kits for are available through Cornell Cooperative Extension educators. You can also obtain sampling kits directly from the lab. (***Source**: The New York Berry News, Volume 02, Number 07, July 17, 2003*)

New York
Nutrient and Elemental Analysis Lab Department of Horticulture Cornell University Ithaca, NY 14853 (607) 255-1785.

Editors Note: More listings of tissue testing labs include:

UMass Soil and Tissue Testing Lab
West Experiment Station/UMass
Amherst, MA 01003
413-545-2311
http://www.umass.edu/plsoils/soiltest/
Fee: $18

UMaine Analytical Laboratory
5722 Deering Hal, Rm 407
Orono, MA 04460
207-581-2945
http://anlab.umesci.maine.edu
Fee: $25

UNH Analytical Services Lab
Spaulding Hall Room G-54
38 College Rd.
Durham, NH 03824
603-862-3210
http://aslan.unh.edu/asl
Fee: $22

UVM Ag. & Environ. Testing Lab
219 Hills Bldg./UVM
Burlington, VT 05405
802-656-3030
http://pss.uvm.edu/ag-testing/
Fee: $20

Disease Diagnostics and Soil Testing

Ruth Hazzard, UMass Extension

This is a time of year when many crops begin to show symptoms of disease. Effective disease management begins with an accurate diagnosis because selection of pesticides and cultural practices should be made to target a particular pest. One correct diagnosis at the right time can save you thousands of dollars in crop losses or wasted sprays or fertilizers. Some diseases are easily recognized in the field but many are not. Fungi, bacteria, nematodes, viruses, chemical or environmental injury, and nutritional disorders can produce symptoms that are difficult to distinguish from one another.

We are fortunate to have diagnostic and soil testing services in this state and we urge you to use them. Diagnostic samples can be sent overnight from anywhere in the state. Call first: Rob Wick, Disease diagnostic Lab, 413-545-1045; Steve Bodine, Soil Testing Lab, 413-545-2311. Or, check our website for more details on submitting samples (www.umassvegetable.org, or www.umass.edu/fruitadvisor and click on Soil Testing or Disease Diagnostic Lab). If you are within an easy drive of the Amherst campus, samples can be dropped off at the lab, on the first floor of Fernald Hall (Disease samples) or West Experiment Station (soil samples). There is metered parking beside the building. It's not hard to find from Routes 116, Rte 9, or I-91! (***Source**: UMass Vegetable Notes, Vol. 14, No. 9, July 17, 2003*)

Measuring Small Amounts for Sprays

Ruth Hazzard, UMass Extension

New products tend to be used in far smaller quantities per acre than the pesticides that were develop 15 or 20 years ago. Growers who are using spinosad for the first time – mainly organic growers who now have Entrust available—may not have used a material with such a low rate per acre. For example, Bt products tend to be applied in quarts or half-pounds per acre, compared to 2 oz (dry) or 3 oz (liquid.) required for this product. When measuring the tiny amounts needed for small plantings over several hundred square feet, it can be difficult to measure accurately. This is especially true with a solid that is measured in grams or tenths of grams such as Entrust. We have made some weight measurements to assist growers in making conversions into a measure that is easy to use: teaspoons. These conversions are specifically for Entrust 80WP. Liquids may be easier to measure in small quantities, if you have access to a small measuring device such as a syringe that measures ml or tenths of ounces. I have found such devices at the local drug store in the children's medicine department.
The following table is provided for informational purposes. No endorsement is implied.

Table 1. Entrust® Spray Rate Conversions*

Acreage	**Square Footage**	**Entrust®** (grams)	**Entrust®** (approximate spoon measure**)
			Teaspoons
1/4	10,890	14.2	9.5
1/8	5,445	7.1	4.75
1/16	2,722	3.5	2.5
1/30	1,500 (300' by 5' bed)	1.95	1.5
1/44	1,000 (200' by 5' bed)	1.3	1
1/88	500(100' by 5' bed)	0.65	0.5

** All area rates based on 2 oz./acre*
*** All spoon measures loosely filled (not packed) and shaved even (not heaped)*
(***Source**: UMass Vegetable Notes, Vol. 14, No. 9, July 17, 2003*)

Sustainable Agriculture Grants for Northeast Farmers

Helen Husher, University of Vermont

Farmers in the Northeast who are interested in conducting innovative production and marketing projects are encouraged to apply to the Sustainable Agriculture Research and Education (SARE) program for grant funds for projects starting in the spring.

Applications can address a broad range of agricultural issues such as pest management, soil and water conservation, aquaculture, marketing, grazing, bee health, no-till, pasture management, agroforestry, and other sustainable farming

techniques. Northeast SARE defines sustainable agriculture as agriculture that is profitable, environmentally sound, and good for the community. In 2003, the average grant was about $5,200; grants are capped at $10,000.

Any full- or part-time farmer in the Northeast SARE region can apply. The region is made up of Connecticut, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, and Washington, D.C. Applications and more information about the requirements of the Farmer/Grower Grant program are available on the Northeast SARE web site at www.uvm.edu/~nesare/. You can also call 802/656-0471 to request a printed application. The proposal deadline is December 8, 2003.

DFA Becomes DAR

The Department of Food and Agriculture has had a name change. Effective July 1st, our name is now the Department of Agricultural Resources. The change takes effect immediately in all legal documents, correspondence and in prominent locations on our web site. It will be implemented on a more gradual basis in publications as we use existing supplies first. Our web address will remain the same (www.mass.gov/dfa) for the time being, but stay tuned for a change there, too, in the near future. (***Source**: Massachusetts Department of Agricultural Resources, Farm & Market Report, Vol. 80, No. 5, July 2003*)

Participate in Farmer Research Groups

Farmer Research Groups are an opportunity for farmers working with other farmers to test practices, develop ideas or answer questions systematically on their own farms. The Farmer Research Group Network helps connect farmers with interests in similar topics, facilitates meetings, finds technical expertise to help the group, provides scientific guidance for the tests or trials, pays experimental and lab costs, and pays each farmer participant an honorarium for their work in the research group.

Farmer Research Groups allow farmers and scientists from all three southern New England states to use resource and expertise efficiently to address farmer priorities. The Network is supported by NE -SARE, the universities of Massachusetts and Connecticut, USDA Natural Resources Conservation Service, and Massachusetts Department of Agricultural Resources. Research groups can work on any topic farmers want to work on. Contact us to find out what problems farmers in Southern New England are solving.

Manure Stacking:
A Farmer Research Group is working to develop efficient, environmentally acceptable techniques for manure stockpiling. The farmers are evaluating various organic materials (old hay, leaves, compost, etc.) layered under and over manure piled in the field to test if they reduce leaching and runoff. First year results were very promising, indicating their may be simple effective techniques to manage manure without a manure pit. If you field stack/stockpile manure prior to fall spreading, or winter stockpile and spring spread you can participate in this study. Farmer Research Groups develop their own solutions to problems on their farms in partnership with scientists. Farmers receive a $500 honorarium for participating in a research group. Contact: Farmer Research Group Network Coordinator: Sue Ellen Johnson, 413-323-4531.

Establishing Rye Cover Crops:
Several farmers are beginning a study about establishment of fall rye cover crops. Among other questions- they plan to test harrowing after germination, timing of manure applications. If you have ideas or nagging questions about managing rye cover crops in your fields- work with other farmers to choose the questions and get conclusive answers. Farmer Research Groups test their own ideas on their farms in partnership with scientists. Farmers receive a $500 honorarium for participating in a research group. Contact: Farmer Research Group Network Coordinator: Sue Ellen Johnson, 413-323-4531. (***Source**: UMass Vegetable Notes, Vol. 14, No. 9, July 17, 2003*)

Crop Insurance: Did You Know?

Jon Clements, UMass Extension

Crop insurance policy plans developed by the USDA Risk Management Agency (RMA) are sold and administered through private insurance companies. There are four types of crop insurance policies available in Massachusetts:

1. Actual Production History (APH)
2. Crop Revenue Coverage (CRC)
3. Dollar Plan
4. Adjusted Gross Revenue (AGR) Pilot Program

All these plans offer protection against unavoidable perils such as adverse weather, insects, and disease. Most plans allow the insured to tailor the amount and type of insurance to fit their specific needs. Many plans offer options for producers who raise specific crops where quality is critical. The USDA subsidizes premiums for all crops. Crop insurance is part of an integrated risk management program that incorporates a combination of risk management tools and concepts. For more information, contact your local crop insurance agent, or visit the USDA RMA web site, http://www.rma.usda.gov. (***Source**: Healthy Fruit, Volume 11, Number 15, July 15, 2003*)

Meetings

July 24 - Weed Identification Workshop, 9:00 am - 3:00 pm at UMass, Amherst. A classroom presentation, potted weed herbarium and weed walk will help participates enhance their weed identification skills. Feel free to bring a weed or two to identify. Workshop held rain or shine (lunch not provided). Sponsored by the UMass Extension's Landscape, Nursery and Urban Forestry Program, 413-545-0895, www.UMassGreenInfo.org.

August 2 - Massachusetts Marketplace Festival, 10:00 am -4:00 pm at Elm Bank Reservation on the Wellesley/Dover line. Sponsored by the Massachusetts Horticultural Society. Contact Carolyn Weston, MHS, 617-933-4984 cweston@masshort.org.

August 6 - Twilight Vegetable Meeting, 5:00 pm to 8:00 pm at 4 Town Farm 90 George Street, Seekonk, Mass. Approximately 200 acres of vegetables, small fruit and greenhouse production. Retail and wholesale sales, mainly retail. Commercial vendors will be present. Contact Frank Mangan, UMass Vegetable team, 413 545-1178 or Steve Clegg, 508 336-5587.

August 8-10 - 29th Annual NOFA Summer Organic Conference, Hampshire College, Amherst, with over 150 workshops on organic farming gardening and sustainable living. Keynote by Sally Fallon, author of "Nourishing Traditions." Special 8 hour pre-conference workshop with Sally Fallon on August 7 and 8 on Traditonal Diets and Nutrition. For more information contact NOFA Summer Conference at 411 Sheldon Road, Barre, MA 01005 (978) 355-2853, nofa@nofamass.org. Or visit www.nofamass.org.

September 20 - The Fifth Annual North Quabbin Garlic and Arts Festival "The Festival That Stinks," 10:00 am to dusk, at Forster Farm, 60 Chestnut Hill Rd., Orange, MA 01364. Contact: suzanne@garlicandarts.com, or visit www.garlicandarts.org.

November 14-15 - 3rd Annual "The Soul of Agriculture: New Movements in New England Food and Farming" at the Northeast Regional Conference, University of New Hampshire, Durham, NH. Presented by the UNH Office of Sustainability Programs' Food and Society Initiative and the Northeast Sustainable Agriculture Working Group (NESAWG). Visit www.sustainableunh.unh.edu or call 603-862-4088.

Massachusetts Berry Notes is a publication of the University of Massachusetts Extension Fruit Program which provides research based information on integrated management of soils, crops, pests and marketing on Massachusetts Farms. No product endorsements over like products are intended or implied.