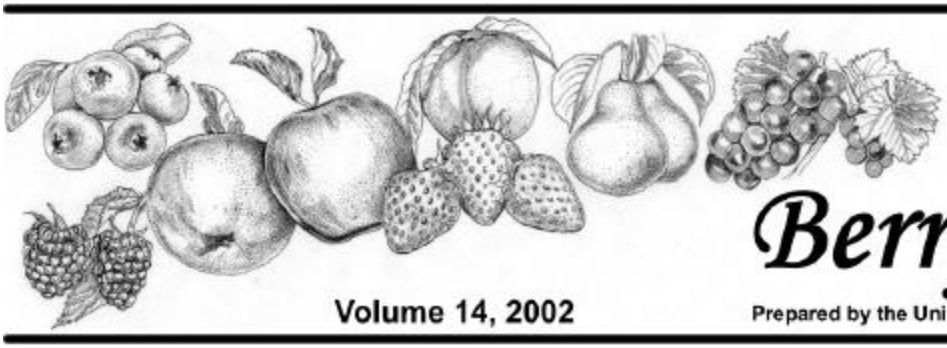

UMASS EXTENSION

Berry Notes

Volume 14, 2002

Prepared by the University of Massachusetts Fruit Team

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Summer Issue #4
http://www.umass.edu/fruitadvisor/berrynotes/index.html

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CROP CONDITIONS

Weather continues to dominate the scene this week with some cold temperatures and heavy rain, wind and hail occurring at some sites. **Strawberry** harvest has begun in many areas with a light crop where frost has hit the hardest. Fruit rot pressure is high this season with the frequent wet periods during bloom and fruit development. See the continuation of an article by Dr. Mike Ellis on fruit rot management in the strawberry section below. Abundant moisture is also cause for concern about slug infestations. See Issue #3 for more about this pest. Continue scouting fields for two-spotted spider mites and tarnished plant bug nymphs. **Highbush blueberries** are past bloom in most areas now. Some locations are showing some damage from freeze injury. Mummyberry infection levels are moderate to high. As indicated last week, Indar 75 WSP has received a section 18 label for Massachusetts. Copies of the label can be viewed at www.umass.edu/fruitadvisor. Blueberry scorch virus is a concern in New England. Be sure to keep an eye out for aphids on new shoot terminals. They can vector the disease from infected to healthy bushes. Cranberry fruitworm are active now and blueberry maggot flies are now active in NJ. Soon they will be here. Read more on this below. Early **summer raspberries** beginning to bloom. Be ready for Botrytis gray mold protection during bloom. Keep up the monitoring for raspberry fruitworm, tarnished plant bug and mites (two-spotted spider mites and European red mites). Watch for potato leafhopper on **fall-bearing raspberries**. **Blackberries** are blooming. Fertilizer applications for brambles (50 – 60 lbs N/acre) should be made as split applications in May and June. If you suspect that much of your first application was leached by heavy rains, increase you second application by about 10%. **Grapes** development continues to progress slowly due to the cool temperatures. Disease management will remain a high priority. Monitor for grape berry moth. Also keep an eye out for Japanese beetle which should be emerging from the soil in the next 7 – 14 days.

ENVIRONMENTAL DATA

This information is intended to be used 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 one-week period, May 23 through May 29, 2002. Soil temperature and phenological indicators were observed on May 29, 2002.

Region/Location	Growing Degree Days		Soil Temp (4" depth)	Accum. Precip
	1 Month Gain	Total		
Cape Cod: Barnstable	75	291	60° F	0.30"
Eastern: Hanson	85	351	70° F	0.35"
Waltham	84	466	61° F	0.53"
Central: Boylston	66	274	55° F	0.30"
Western: Amherst	69	360	57° F	0.17"
Great Barrington	81	366	58° F	0.12"

*(**Source**: UMass Extension Landscape Message #13, May 31, 2002)*

STATE WEATHER SUMMARY For the Week Ending Sunday, June 2, 2002

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

STATE	AIR TEMPERATURES				PRECIPITATION	
	LO	HI	AVG	DFN	LO	HI
ME	32	86	61	+5	0.00	2.40
NH	32	86	64	+6	0.59	3.30
VT	34	86	64	+7	0.26	3.63
MA	46	87	66	+6	0.19	2.42
RI	52	85	65	+6	0.33	0.64
CT	49	88	67	+5	0.34	2.30

*(**Source**: New England Ag. Statistics Service, Weekly Crop Weather Report, Volume 23, No. 6, June 3, 2002;)*

Strawberries

Using Fungicides to Control Strawberry Fruit Rots in Ohio; Part II

Mike Ellis, Ohio State University

During Bloom

This is the critical period for control of *Botrytis*. In addition, in fields infested with *Colletotrichum* (anthracnose), the fungus may be able to build up inoculum on symptomless (apparently healthy) foliage during warm, wet weather. Increased inoculum could result in increased fruit infections if weather remains favorable for disease development. The main fungicides for control of *Botrytis* are Topsin-M 70WSB, Elevate 50WG, and Switch 62.5WG. All of these materials have excellent efficacy for control of *Botrytis*, but only Switch has efficacy against anthracnose. This is an important point to remember if anthracnose is a problem in the planting. I also recommend that all of these materials be tank-mixed with Captan or Thiram during bloom. Captan and Thiram are protectant fungicides that provide some additional control against *Botrytis* (gray mold), anthracnose fruit rot, and leather rot. In addition, mixing the materials should also aid in reducing the risk of fungicide resistance development.

For successful *Botrytis* control, it is important to provide fungicide protection throughout bloom. Remember that early blooms (king bloom) may be your largest and best quality fruit, so protection needs to be started early (at least 10% bloom). The number of bloom sprays required depends upon the weather. If it is hot and dry, no fungicides are required. All of the fruit rot diseases discussed here require water on the flowers and fruit in order to infect. If it is very dry and overhead irrigation is used for supplemental water, irrigation can be applied in early morning so that plants dry as fast as possible. Keeping plants dry reduces the need for fungicide application. Fortunately, most years are not this dry and fungicides are generally applied on at least a 7-day schedule through bloom. If it is extremely wet, a shorter interval (4-5 days) may be required in order to protect new flowers as they open. Although *Botrytis* is the primary pathogen we are trying to control during bloom, the selection of the proper fungicides should also aid in reducing the buildup of anthracnose as well. This is important to remember in plantings where anthracnose is a problem or threat.

Post Bloom Through Harvest

As bloom ends and green fruit are present, the threat from *Botrytis* infection is generally over. Green fruit are resistant to *Botrytis*. If you got *Botrytis* infection in fruit during bloom, it will not show up until harvest as fruit start to mature. At this point, it is too late to control it.

As new fruit form through harvest, the threat of anthracnose fruit infection increases. In many plantings, anthracnose is not present or is not a problem. In these plantings no additional fungicide should be required after bloom through harvest. Unfortunately, you cannot determine if anthracnose is a problem until you see it. Often, this is too late to control it. In plantings with a history of anthracnose fruit rot, or if the disease is identified in the plantings, fungicides with efficacy for anthracnose control may be required from the end of bloom through harvest. Remember, anthracnose is favored by warm to hot wet weather. In addition, anthracnose appears to be a greater problem in plastic culture plantings.

The following are suggestions for developing a fungicide program for simultaneous control of strawberry fruit rots.

Fungicide and (rate/A)	Comments
Prebloom	
Captan 50 WP, 6 lb. or Captec 4L, 3 qt. or Thiram 75WDG (4.4 lb)	Prebloom applications should be required only if excessive water from rain or irrigation is a problem early in the season. Fungicides here could help reduce build-up of *Botrytis* and *Colletotrichum* inoculum. In dry or more "normal" seasons, fungicide is probably not required until bloom starts.
During bloom	
Switch 62.5WG (11-14 oz.) or Elevate 50WG (1-1.5 lb.) or Topsin-M 70WSB (1 lb.) plus: Captan 50WP (4-6 lb.) or Captec 4L (2-3 qt.) or Thiram 75WDG (4.4 lb.)	This is the main time to control Botrytis, and if temperatures are high, Colletotrichum could build up in the planting. Switch is excellent for control of Botrytis and is also good to excellent for control of anthracnose. Obviously, this is ideal. The addition of Captan or Thiram provides additional protection against both diseases and may aid in reducing fungicide resistance development. Topsin-M and Elevate are both excellent for control of Botrytis, but have no activity against anthracnose. Where anthracnose is not a threat, these fungicides will provide excellent Botrytis control. When combined with the high rate of Captan or Thiram, the combination should provide some level of anthracnose control. If anthracnose is a concern, Switch would be the fungicide of choice. None of the fungicides (Switch, Elevate or Topsin-M) should be applied more than twice before alternating with a fungicide of different chemistry. This is to aid in reducing fungicide resistance development.
Post bloom Through Harvest	
Quadris 2.08F (6.2-15.4 oz.) **or** Switch 62.5WG (11-14 oz.) **tank-mixed or alternated with:** Captan 50WP (3-6 lb.) **or** Captec 4L (1.5-3 qt.)	As green fruit develop, the threat of anthracnose infection increases. Quadris is probably the most effective material for anthracnose control. If anthracnose is a problem, the highest label rate should be used. This may be the best time to use Quadris. Switch is also effective for control of anthracnose. If the risk of anthracnose is high or the disease has been observed in the planting, Quadris plus Captan should be applied 7 days after the last bloom spray for Botrytis. If anthracnose remains a threat, sprays should probably be repeated on a 7 day interval through harvest. As harvest approaches, Captan should be removed from the program. Captan applied close to harvest could result in visible residues on fruit and this can be a big problem. Quadris or Switch applied alone should result in minimal visible residues on fruit and can be applied on the day of harvest (0-day PHI). Remember, these preharvest sprays are required only if anthracnose is a threat or problem.

The extensive use of Captan in this program could result in problems with visible residues on fruit. This needs to be considered, but under heavy disease pressure for anthracnose a high level of Captan usage may be required. The Catec 4L (flowable) may result in less visible residue than the Captan 50W (wettable powder). Alternating Captan with Quadris or Switch rather than combining Quadris with Captan in every other spray should be helpful in reducing visible residues. The use of Quadris or Switch alone in the last spray or two before harvest should aid greatly in reducing visible residues.

As mentioned previously, leather rot should be controlled by good soil drainage (no standing water) and a good layer of straw mulch to prevent berries from soil contact. If leather rot is a threat or a problem, fungicides may be required. Quadris has excellent activity against Phytophthora diseases on other crops. Although not on the label and I have seen no data to support this idea, Quadris may have some activity for control of leather rot in addition to anthracnose and Botrytis gray mold. If applied at the time suggested here (green fruit through harvest) for anthracnose, Quadris may be beneficial for control of leather rot as well. We are currently conducting research to determine the efficacy of Quadris for leather rot control.

Fungicides for Leather Rot Control

As previously mentioned, emphasis for leather rot control should be placed on the use of cultural practices, such as planting on well drained sites or improving water drainage in the planting and a good layer of straw mulch to prevent berry contact with the soil. When needed, the following fungicides are labeled specifically for control of leather rot.

Ridomil Gold is labeled for control of Red Stele (caused by *Phytophthora fragarieae*) and Leather Rot (caused by *Phytophthora cactorum*). The label for perennial strawberries reads as follows: "Established Plantings: Apply Ridomil Gold EC at 1 pt. per treated acre in sufficient water to move the fungicide into the root zone of the plants. Make one application in the spring after the ground thaws and before first bloom. A second application may be applied

after harvest in the fall." **Note**: Although not labeled for leather rot control, the early spring application for red stele control should provide some control of leather rot. For supplemental control of leather rot, an application may be made during the growing season at fruit set. This application at fruit set (as green fruit are present) has been very effective for leather rot control.

Aliette 80WDG is labeled for control of Red Stele and Leather Rot. For Leather Rot, apply 2.5 to 5 lb/A. Apply as a foliar spray between 10% bloom and early fruit set, and continue on a 7-14 day interval as long as conditions are favorable for disease development. Applications can be made the same day as harvest (PHI=0 days). Do no exceed 30 lb product per acre per season.

Remember these are only suggested guidelines for a fruit rot control program. It is always the grower's responsibility to read and understand the label. (***Source**: Ohio Fruit ICM News, Volume 6, Issue 12 May 2, 2002*)

Brambles

New Insecticide for Raspberries and Other Caneberries

Celeste Welty, Ohio State University

A pyrethroid insecticide is now registered for use on caneberries: Capture 2EC with the active ingredient bifenthrin. Bifenthrin is the same AI as found in Brigade 10WP, which is registered for use on strawberrries. Both Capture and Brigade are made by FMC Corporation and both are restricted use pesticides. Target pests listed for caneberries are leafrollers, root weevils, and spider mites, but it is likely to control other pests as well, such as rose chafer, red-necked cane borer, tarnished plant bug, and thrips. The use rate is 3.2 to 6.4 fluid ounces per acre. The pre-harvest interval is 3 days. The re-entry interval is 24 hours for machine harvested berries or 4 days for other berries. (***Source**: Ohio Fruit ICM News, Volume 6, Issue 16, May 30, 2002*)

Blueberries

Insect Update

Dr. Sridhar Polavarapu, Mr. Dean Polk, Rutgers University

Blueberry maggot (BBM):

Yellow sticky traps have captured the first adult blueberry maggot fly on June 4 in NJ.

This is one of the earliest dates of first blueberry maggot trap capture that I have seen in New Jersey. Growers who follow a calendar-based blueberry maggot control program, as part of Blueberry Maggot Certification Program for fresh fruit export to Canada, should apply their first blueberry maggot insecticide applications by June 14, 10 days after the first emergence of blueberry maggot flies. To completely protect the fruit from BBM infestations, subsequent insecticide sprays should be continued at 7-10 day intervals after the first application thru last harvest. Insecticide choices for BBM management include Malathion, Imidan, and Lannate.

Blueberry maggot has a single generation each year. The adult BBM is somewhat smaller than a housefly and is readily recognized by black bands across the wings and whitelines on the abdomen. BBM overwinters as a pupa buried in the soil below the blueberry bushes. Bulk of the adult emergence occurs over a 4-5 week period, although emergence can continue over a 14-16 week period. Females begin to lay eggs about 10 days after emergence. Because the adult female flies require about 10 days to mature and initiate egg laying under field conditions, insecticide treatments are recommended 10 days after the first adult capture on the yellow sticky-traps. Eggs are laid just beneath the ripe or ripening blueberries. Insecticides will not offer any control of BBM, if eggs are already laid in the berries. The maggots mature in about 20 days under field conditions and then drop to the ground to pupate. Berries infested with BBM larval stages can be readily recognized by their soft and mushy appearance.

Sharpnosed-leafhoppers (SNLH): Adult flight has started and our yellow sticky traps are capturing adult SNLH for the past few days. This is the beginning of the first generation flight. SNLH is the principal carrier of the phytoplasma that causes the blueberry stunt disease. Leafhoppers acquire the phytoplasma when they feed on diseased bushes. The disease is spread when these leafhoppers inject phytoplasma into healthy bushes while feeding. Diseased bushes are generally stunted with many short, slender twigs and shortened internodes. Leaves on diseased bushes are often cupped downward and are reduced in size. Fruit set and berry size is generally reduced and bush life is shortened. Although several species of leafhoppers that occur on blueberries have been implicated in the transmission of blueberry stunt disease, the SNLH constitutes the bulk of the leafhopper population in New Jersey.

SNLH has two generations in New Jersey. This insect overwinters as eggs laid in the tissues of fallen blueberry leaves. Eggs begin to hatch from mid-May, and nymphs reach adult stage in June after completing five instars. Both nymphs and adults have a distinctly sloped and pointed head.

Insecticides applied for aphids, fruitworm, and blueberry maggot will also control SNLH. Rouging and destroying stunted bushes is essential to reduce the spread of this disease. It is also important to control weeds and other woody non-blueberry plants in and around commercial fields, because they could act as hosts of SNLH. This is a good time to start looking for stunted bushes and complete rouging before the peak adult activity period.

Cranberry fruitworm: Trap counts have decreased substantially in both Atlantic and Burlington Counties. A second fruitworm treatment, if required should be applied before the end of the week. Imidan, Diazinon, and Lannate can provide effective control of CBFW. (Source: The Blueberry Bulletin,

Re-entry Intervals (REI) and Post-harvest Intervals (PHI) of insecticides:

Following are updated REI and PHI for some of the commonly used insecticides. Please note the corrected REI and PHI for Guthion and Admire.

Product	REI	PHI
Asana	12 hrs	14 days
Diazinon	24 hrs	7 days
Guthion	**48 hrs for scouting - 96 hrs for harvesting**	**7 days**
Imidan	24 hrs	3 days
Lannate	48 hrs	3 days
Malathion	12 hrs	1 day
Sevin	12 hrs	7 days
Confirm 2F	4 hrs	14 days
Provado 1.6F	12 hrs	3 days
Admire 2F	**12 hrs**	**7 days**
SpinTor 2SC	**3 hrs**	**4 days •**

Grapes

Plant Tissue Analysis

Tony Wolfe, Virginia Poly Tech

Tissue analysis is one of several means of monitoring plant nutritional needs, avoiding nutrient deficiency symptoms, or correcting nutrient deficiencies. Bloom-time (or close to bloom) is the recommended time for collecting grape tissue samples in Virginia. An in-depth discussion is provided in the Mid-Atlantic Winegrape Grower's Guide (www.ces.ncsu.edu/resources/winegrape/). Leaf petioles (75 to 100) are collected, dried and submitted to either a commercial or university lab for mineral analysis. The diagnostic sample concentrations are compared to standard concentrations associated with nutrient adequacy. On the basis of that comparison, the lab can indicate whether your vines are at deficient, adequate, or surplus levels for each of the tested elements. Tissue analysis should be used in combination with a visual assessment of vine growth, and with periodic soil sampling. Besides the routine bloom-time sampling, tissue sampling would also be recommended to help diagnose potential nutrient deficiency symptoms that develop later in the season. At $18 per sample, the Penn State service is still about the best bargain, but may not be quite as rapid as a commercial lab. If you wish to use the Penn State lab, give me a call and ask for a/some submission kits (one kit per sample). The three labs listed below are three that we've used; however, there are others available. Readers in North Carolina should check with North Carolina State University for in-state service.

Labs conducting grape tissue analysis:
A & L Eastern Agric. Labs, Inc.
Richmond, VA
(804) 743-9401
www.al-laboratories.com/lab-richmond.htm

Agric. Analytical Services
The Penn. State University
University Park, PA
(814) 863-6124

Brookside Analytical Lab.
New Knoxville OH
419-753-2448
www.blinc.com

A comprehensive listing of plant and soil labs, some focusing on biological and organic matter analyses, can be found at www.attra.org/attra-pub/soil-lab.html. (***Source**: May-June Viticulture Notes, 2002*)

Grape Disease Management: 2002 – Putting it all together

Dr. Wayne Wilcox, Cornell University,

[**Editors Note**: this article represents the conclusions presented from a longer and very thorough discussion of disease management in grapes for 2002 which can be found at: http://www.ext.vt.edu/news/periodicals/viticulture/02mayjune/02mayjune.html]

1-INCH SHOOT GROWTH. A Ph spray may be warranted if wet weather is forecast and the training system or recent block history suggests high risk. Option A: Nothing. Option B: Captan or mancozeb.

3-5 INCH SHOOT GROWTH. A traditional time to control Ph shoot infections. Perhaps more importantly, our recent evidence indicates that this also is an important time to control rachis infections, which can occur once clusters emerge. Since the late 1980's, we've considered this the time to start control of PM on vinifera varieties if temperatures consistently remain above 50°F. It's a hard thing to prove, but I'm not so sure this spray is that important in vineyards that were "clean" last year (little overwintering inoculum). If you're spraying anyway for Ph, it won't hurt to add something for PM, but this is probably the least important PM spray of the season. More likely to be important under relatively warm conditions (>65°F), less important if cool. BR control is seldom justified unless you're trying to clean up a real problem block AND weather is wet. Option A: Nothing. Option B: Mancozeb (BR, Ph). Option C: Captan (Ph). Easier on predator mites than mancozeb (or ziram), but not as effective against BR (which seldom matters at this time). Option D: Nova or Elite (PM, BR). Use 3 oz/A for economy with so little foliage now, but remember that coverage becomes even more important when you're working with lower tank rates. Option E: Rubigan (PM). At 2 fl oz/A (minimal labeled rate), cost is only about $4. Cheaper than Nova and Elite, especially if BR control isn't an issue. Option F: Sulfur (PM). Not very active at temps below 60°F, but neither is the PM fungus. Doesn't control other diseases. Option G: JMS Stylet Oil (PM). Should eradicate young infections IF thorough coverage is provided. Can use with mancozeb (or ziram), but not with captan (phytotoxicity). Option H: Nutrol (PM). Should eradicate young infections IF thorough coverage is provided. Option I: Serenade, if you want to experiment with minimal risk. Otion J: One of the PM products plus mancozeb or captan for Ph.

10-INCH SHOOT GROWTH. Traditionally, we've recommended not to wait any longer to control BR. Continued experience tells us that this recommendation is conservative (the spray generally isn't needed) unless BR was a problem last year (inoculum levels are high) and weather is wet and warm. Don't wait any longer to control PM on susceptible varieties (but wait until immediate prebloom on Concords). One of the best times to use an SI, also a possible time to experiment with "alternative" materials. DM control will be needed on highly susceptible varieties if disease was prevalent last year and rains of at least 0.1 inches at temps >52°F occur. Rachis infections by Ph are a danger in blocks with a history of the disease. Option A: Abound, Sovran, or Flint (PM, BR, some Ph; also, variable DM). Legal, but not the most efficient time to apply these materials. Expensive and increases resistance pressure if you intend to use them later, when they're really needed. Option B: Mancozeb (BR, Ph, DM). A broad spectrum, economical choice if PM isn't a serious concern. Or tank mix with a PM material. Excessive use sometimes leads to mite problems by suppressing their predators. Option C: Nova or Elite (PM, BR). Option D: Rubigan (PM). Poor BR (usually not a problem if effective materials are applied in the next three sprays) but cheaper than Nova and Elite. Option E: JMS Stylet Oil (PM). If (and only if) coverage is thorough, this spray should eradicate early PM colonies that may be starting if previous PM sprays were omitted. At a retail cost of $11/gal, a use rate of 1% (1 gal oil /100 gal water), and 50 gal/A spray volume, cost is about $5.50/A. But don't waste your money if you can't cover thoroughly. Also may help with mites. Option F : sulfur (PM). Reduced activity (of both the sulfur and fungus) at low temperatures canh still be an issue at this time of year. Option G: Mancozeb (BR, Ph, DM) + a PM material (SI fungicide, sulfur, JMS Stylet Oil, Nutrol). Choose PM material based on previously-discussed characteristics and cost.

IMMEDIATE PREBLOOM TO EARLY BLOOM. A critical time for PM, BR, DM, and Ph (fruit infections). A good time to use a strobilurin on PM susceptible varieties. This and the first postbloom spray are the most critical sprays of the season--DON'T CHEAT ON MATERIALS, RATE, OR COVERAGE! Option A: Abound, Sovran, or Flint. Abound is very good to excellent against PM, DM, and BR, although the other two are a bit stronger against PM. Sovran is marginal against DM under pressure. Flint is outstanding against PM, inadequate against DM. All are equivalent against BR. The best choice in most Finger Lakes vineyards where SIs have been used for a number of years against PM, particularly if multiple disease control is needed. Should also provide some Botrytis control if a wet bloom period. Option B: Either Nova, Elite, or Rubigan PLUS mancozeb (PM, BR, Ph, DM). Nova and Elite are the biggest guns against BR, so might be the best choice if pressure is high and BR control is more important than PM. Nova and Elite provide postinfection activity against BR, so would be first choice if significant unprotected infection periods occurred within the previous week. Rubigan is (was?) cheaper that Nova or Elite, but doesn't provide nearly the same BR control; however, mancozeb should be adequate if postinfection control isn't required. If wet, mancozeb (or captan) should be included for control of Ph fruit infections in blocks where this has been a

historical problem (processor restrictions and poor BR control with captan). Option C: Mancozeb + sulfur (PM, BR, Ph, DM). Cheap and reasonably effective but not the strongest choice at a time when the strongest choice is most justified. Potential mite problems.

MID- to LATE BLOOM. Vangard or Elevate for Botrytis control may be beneficial in certain years, particularly in problem blocks if weather is persistently wet. Abound, Sovran, or Flint applied recently may be adequate.

FIRST POSTBLOOM (10-14 days after immediate prebloom spray). Still in the most critical period for PM, BR, DM, and Ph (fruit). Same considerations and options as detailed under IMMEDIATE PREBLOOM. Juice grape growers can substitute Ziram (very good BR and Ph, only fair DM) for mancozeb if necessary.

SECOND POSTBLOOM. BR control still advisable under wet conditions and important if infections are evident on the vine. Fruit are less susceptible to PM now, but vinifera varieties (and susceptible hybrids?) still need PM protection, particularly to guard against fruit rots and promote wine quality. New foliage remains highly susceptible to PM. Avoid SI and strobie fungicides if more than a little PM is easily visible. Ph danger is mostly over unless very wet. Primary DM should be over, but continued protection may be needed on susceptible varieties if weather is wet, especially if disease already is established (look and see) Option A: Abound, Sovran, or Flint. Provides good residual control of the listed diseases if used now, but avoid overuse to promote resistance and wallet management. Should provide some Botrytis control. Option B: Nova or Elite (BR, PM) + captan or mancozeb (66-day preharvest restriction, mites) if DM and Ph control are needed. Option C: Rubigan (PM) + either (a) mancozeb (if more than 66 days before harvest) for BR, DM, and Ph; or (b) captan (DM, Ph, some BR); or (c) ziram (BR, Ph, some DM). Option D: Sulfur (PM) + either (a) mancozeb (if still allowed, mites have been considered) or (b) captan. In most years, lessening disease pressure makes this economical option increasingly practical as the season progresses. Option D: Copper + lime (some PM, DM). Adequate PM control for Concords, not enough for vinifera and susceptible hybrid varieties.

ADDITIONAL SUMMER SPRAYS. Check the vineyard regularly to see what's needed, the main issues will be PM and DM. On vinifera and other cultivars requiring continued PM control, use sulfur as an economical choice to maintain control; SIs and strobilurins are options if they haven't been overused earlier AND little disease is evident. Both provide the advantage of longer residual activity than sulfur, especially in wet weather. For DM, copper + lime or captan are economical standards; Abound is a viable option if general disease pressure or other conveniences justify its cost; Ridomil can be used in case of emergency. BR should not be an issue after the second postbloom spray, except in unusual circumstances (disease is established in the clusters of vinifera varieties, wet weather is forecast, and it's possible to direct sprays onto the clusters). Ph should not be an issue. See previous discussion for Botrytis at veraison, and preharvest. (***Source**: May-June Viticulture Notes, 2002*)

General

Managing Insects with Horticultural Oils

Mira Danilovich, Michigan State University

Horticultural oils offer a valuable option for insect control, yet they are probably the least explored alternative. Ever since the mid 80's when I worked extensively with oils, I have been a proponent of their use. I guess they have proven to be an example for the axiom that it is better to prevent the problem than to deal with it once it is established.

What are horticultural oils?

Horticultural or "dormant" oils, as they are often referred to, are a petroleum product. They are effective in controlling pests during certain developmental stages in which pests are not vulnerable to other insecticides and miticides. Oil programs are aimed primarily at scale species, adelgids, aphids, mealybugs, mites, plant bugs (eggs and nymphs), psyllids, eggs of certain moths (fall cankerworm, webworms), leafhoppers, leafrollers (eggs and young larvae) and early instars of hairless larvae.

Oil effectiveness

In the past, various oils had different degrees of refinement. The problems associated with oil sprays are most often due to the purity of the oil and rates applied. There are several criteria that need to be considered when determining the effectiveness of oil. The unsulfonated residue (UR) of 92% and above is preferred. (This refers to the degree of refinement to remove sulfur impurities.) The higher the percentage, the more refined the oil. These highly refined oils are known as "Superior Oils". There are several trade names for them, like Sun UltraFine Oil, Sunspray, Superior 70 Oil, Supreme Oil, etc.

Gravity, or density reading, refers to the weight of the oil. Paraffinic oil is less dense than aromatic hydrocarbon type.

Viscosity is the most important parameter when selecting the oil for spraying fruit trees. Viscosity is expressed in seconds and represents the time needed for the drop of oil to pass

through a standard opening. This in turn relates to the length of time that the oil is exposed to effectively cover the plant before breaking down. The values for dormant oils are from 90--150 seconds. For the summer or verdant oils, the values are from 65-90. To be on the safe side, oils 65-70 seconds should be used for summer sprays.

How oils work

Superior oils work as contact insecticides and miticides. It is essential to provide excellent coverage so that the targeted pest gets in contact with the oil in order to have satisfactory control. To achieve that, a minimum of 100 gallons of water per acre is recommended. Oils are mixed with emulsifying agents that allow them to make a milky solution when added to the water. The mixture has a good tank life, usually up to several days. However, it is best to use fresh mixture and all fills should be made for what is needed for each day. Before spraying, oils in the drums should

be checked for proper emulsion formulation. This could be easily tested by mixing 2% volume/volume solution of oil in 1 gallon of water, shaking well, and letting it sit for 5 minutes. If the solution turns milky, the oil is good and can be used. If the oil stays on the water surface, the emulsifier is gone and the mixture is not safe. The oil should not be used!

Pest control falls into two basic categories: interference with egg development and reducing the insect or mite population after hatching. In the first instance, the oil may prevent normal oxygen exchange through the egg covering and hardening of the outer membrane which prevents hatching. Another possibility is the dissolving of the outer covering and oil penetrating into the egg itself, thereby causing coagulation of the protoplasm. When the oil gets in contact with the larval or adult stage of the insect or mite, it may interfere with the insect,s respiratory activity by blocking the tracheal openings on their bodies or, possibly, may create imbalance in hormonal activity.

Best time to spray oil

Oil sprays are best known for their use in “dormancy”, though they could be used throughout the “green” season. With dormant sprays there is a dilemma whether it is better to spray in fall or in spring. In either case there area couple of things to consider: frost potential and the problem of determining dormancy.

How can we be sure that the trees are truly dormant? Leaf drop does not necessarily mean that the trees are dormant! If mild conditions prevail in the fall, the cells in the wood and cambial layer may still be active. Spraying oil will block and seal the pores and hinder the normal gas exchange, killing off the tissue. In our northern climate it is important to have a minimum of 48 cumulative hours of below freezing temperatures before we can safely apply oil at the dormant rates. Normally, it will take a few days with the temperatures in low twenties or in the teens to satisfy this requirement and stop any activity on the cellular level in the trees.

In spring, just a week of higher than normal temperatures will trigger the “coming out” of dormancy. Oil applications at this time followed by mild weather are not a problem. However, if the period of above normal temperatures is followed by a sudden drop in temperatures after the trees have been sprayed, significant tissue damage will occur.

Using oils in the “green” stage during summer is recommended for scale, aphid, and mite control. Superior oils are relatively safe, and most fruit trees will tolerate the application at summer rates. Summer oil rates do, however, depend on the overall health of the trees, temperatures, and “accompanying” materials in the spray tank.

Severely stressed plants should not be sprayed with the oil. Generally, if there is some stress involved, the rate should be cut down to 1.25 percent. Normally, it is safe to spray 70 seconds oil at 1.25 percent rate. If there is temperature above 7580° F, the rate should be dropped from 1.25 percent to 1 percent. It is not advisable to spray oil when the temperature is above 80° F. If there is an insecticide in the spray mix, drop the oil concentration to 1 percent.

When working with oils it is important to pay attention to the pressure and agitation. Spray should be done at lower pressure (never to exceed 300PSI). Otherwise, the oils can be “driven” into the tissue, which can result in significant “burn” and potential dieback. Damage will also occur if the sprayer agitation is not working properly. Under this scenario, the oil will tend to separate and result in nonuniform concentrations on the plant.

Hot mixes

Oil is not compatible with Captan, Morestan, Sulfur or any other sulfur-containing compound. It is necessary to provide a safe interval (two weeks) between the oil application and use of any of the cited compounds. Otherwise, phytotoxicity will occur. (*Source: Michigan State Fruit Crop Advisory Team Alert, June 4, 2002*)

Meetings

UMass Extension Fruit Team Twilight Meetings:

The following three meetings are the final round of the monthly spring twilight meetings for 2002. They focus primarily on tree fruit issues but many of the orchards also have small fruit plantings. All meetings have a $10 registration fee and offer 1.5 pesticide recertification credits. The programs start with a farm tour at 5:30 followed by a speaking program and refreshments.

Directions can be found at www.umass.edu/fruitadvisor or by calling Jon Clements at 413-323-4208.

June 11 - Clark Bros. Orchards, 580 Apple Valley Rd., Ashfield, MA

June 12 - Lanni Orchards, 294 Chase Rd. (Rte. 13), Lunenburg, MA

June 13 - Noquochoke Orchards, 594 Drift Rd., Westport, MA

July 10 - Summer Meeting - Mass. Fruit Growers Assoc. - UMass Cold Spring Orchard, 393 Sabin St., Belchertown, MA - TBA - Jon Clements, 413-323-4208

Massachusetts Flower Growers Summer Field Day

Tuesday, July 30, 2002 1:00 PM to 7:00 PM
Co-sponsored by University of Massachusetts Extension and Massachusetts Flower Growers' Association
Join us at Flower Growers' Summer Field Day on July 30th on the beautiful grounds at Elm Bank Reservation, Dover MA. Our educational program features Rick Schoellhorn, University of Florida on "Practical Guidelines for Managing Plant Height of Spring Crops in Massachusetts", Delilah Onofrey, Greenhouse Grower Magazine & America in Bloom and Tom Mahoney, Mahoney's Garden Center on the "How to Become Involved in the America in Bloom" program, a Grower Panel – "What we plan to change in our business over the next 10 years" and UMass Extension on "Reviewing the Spring Growing Season". A trade show under the tents, tour of the bedding plant trial gardens, delicious lobster/clambake/chicken dinner and the MFGA benefit raffle will complete the day.

Preregister by contacting Tina Smith, 413-545-5306 or Paul Lopes 508-295-2212 ext. 24, University of Massachusetts or Bob Luczai, Massachusetts Flower Growers' Association at 978-952-0116 or visit our websites www.umass.edu/umext/floriculture and www.massflowergrowers.com.

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