

Berry Notes

Prepared by the University of Massachusetts Fruit Team

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Crop Conditions:

Strawberry fields are fairly quiet at this time of year. But, irrigation is still very important at this time of year to ensure good crown expansion, runner production and flower bud initiation for next year. Remember to do leaf tissue analysis on renovated fields once foliage has grown back. See last weeks Berry Notes for more information on leaf tissue analysis. **Highbush blueberry** harvest is moving into mid- season with most growers reporting good size, flavor and yield, despite early concerns about winter injury. Some locations do have significant amounts of Phomopsis cane blight. See Berry Notes Vol. 15, No. 10 for more on this. Make sure to keep blueberries well irrigated during the late summer, too. **Summer raspberry** harvest is winding down especially with this hot weather. Floricane removal should wait until the winter unless spur blight or cane blight are found. Mites (both two-spotted spider mites and European red mites) are flaring up in some locations. Savey® 50DF may be used in brambles but has a 3 day pre-harvest interval. Predator releases will help suppress them without the need for sprays during harvest. Call me for sources (413-545-4347). Look for cane borer infestations (flagging tips of primocanes) and prune out infested canes before borers cane tunnel down to the crowns. **Fall raspberries** will be ripening soon. Check for signs of Botrytis infections that may cause post harvest deterioration of the fruit. Switch fungicide is labeled for use against Botrytis in raspberries and is an effective tool for managing this disease. A copy of the supplemental label is available on the fruitadvisor website (www.umass.edu/fruitadvisor). Make sure that you have the support trellis installed to prevent lodging of the canes as the fruit sizes up and gets heavier. **Grape** clusters are sizing up and will be closing soon. Disease management is important now to prevent bunch rot infections. Japanese beetles are present in some vineyards and should be controlled. Mite infestations can build up quickly at this time of year. Be sure to check the underside of your leaves for infestations. More on this next time.

Environmental Data

STATE WEATHER SUMMARY For the Week Ending Sunday, July 27, 2003

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	48	87	69	+2	0.00	3.60
NH	45	90	69	+2	0.09	3.21
VT	50	86	69	+2	0.75	3.37
MA	51	88	74	+3	0.15	2.32
RI	60	86	73	+2	0.28	1.78
CT	54	89	73	+1	0.68	2.72

(Source: New England Ag. Statistics Service, Weekly Crop Weather Report, Volume 23, Number 15, July 28, 2003)

Strawberry

Black Vine Weevil Management in Strawberry

(Vern Grubinger, Univ. of Vermont from info supplied by Richard Cowles, CT Ag. Exp. St., Peter Shearer, Rutgers Coop. Ext., and others)

The larvae of several kinds of root weevils can cause serious damage to strawberry roots, leading to reduced yield and in at least one case this year in southern Vermont the complete demise of a previously healthy field. Black vine weevil (BVW) is probably more common than strawberry root weevil or rough strawberry root weevil in New England. The life cycle and management of these weevils are the same. Their larvae are whitish, crescent-shaped larvae and 1/4 to 1/2 inch long with no legs. Adults emerge and feed from May through August, laying eggs as late as October that hatch and overwinter as larvae. Adult feeding causes characteristic scalloping or notching of the leaf edges, but rarely does this cause economic damage. (Feeding on the interior of the leaf, causing holes, is caused by Asiatic garden beetles or Japanese beetles.)

Adults weevils hide in the crowns during the day and feed at night. They are not easy to kill with insecticides so a better strategy is to kill the larvae with applications of beneficial nematodes. If adults are numerous (i.e. more than 50 out of 100 leaves sampled across the field have notching) then a spray may be warranted. The pyrethroid bifenthrin (Brigade) provides some control if used at the highest labeled rates. The best timing for this spray is at night during the peak feeding activity of adults, before they start laying eggs, or about 1 week before harvest ends. Neem-based products containing azadiractin (such as Aza-Direct) may be acceptable for organic production, and while neem will not kill the adults it can disrupt egg-laying if applied at high rates at least twice. While Admire is very good for controlling some white grubs it is mediocre against Asiatic garden beetle and very poor against BVW.

Although bifenthrin claims to kill spider mites, many twospotted spider mite populations are resistant to pyrethroids. Spraying this product or other pyrethroids usually exacerbates spider mite problems by selectively killing off predatory mites. Growers challenged with black vine weevil problems should plan well ahead, and use horticultural oil (SunSpray UltraFine Oil) early in the growing season. If applied with an airblast mist blower, oil can be inexpensive, effective, and non-toxic to predatory mites. This strategy can then reduce the risk of spider mite problems later. Be sure to use oil ~2 weeks before any Captan sprays, because the two products are extremely phytotoxic. Alternatively, Brigade may be applied with oil 2 - 3 days after mowing the foliage during renovation. This approach should jointly control spider mites and root weevil adults.

The key to successful use of beneficial nematodes is sufficient time for multiplication of the nematodes in hosts (weevil larvae) and dispersal of nematodes throughout the soil. Early- to mid-May application has given excellent results, especially when the numbers of larvae of the next weevil generation are evaluated in the autumn. Research in CT, NJ and elsewhere has shown that the appropriate nematode species properly applied can effectively infect and suppress weevil populations. *Heterorhabditis bacteriophora* (Hb) appears to be the best candidate for control of root weevils when the soil temperature is above 60 degrees ('J-3 Max Hb' from The Green Spot; 'GrubStake HB' from Integrated Biocontrol Systems; 'Larvanem' from Koppert Biologicals). Beneficial nematodes can also be applied in late summer (August 15 - September 1), and in that case, *Steinernema feltiae* ('Nemasys' from Griffin Greenhouse Supply, 'Gnat Not' from Integrated Biological Control Systems, 'Entonem' from Koppert Biological) should be considered in northern locations since it tolerates cooler soil temperatures and completes its life cycle so quickly. Other beneficial nematodes may also control weevils but these 2 species were most commonly found established in CT strawberry fields. There is no point in applying beneficial nematodes in early or mid-summer since few larvae are present.

Nematodes are living organisms and they can be killed if they are misapplied. Order nematodes ahead of time and be ready to apply them through a sprayer or irrigation soon after they arrive, refrigerating if delay is necessary. Do not apply nematodes using a sprayer with a piston pump. Use clean equipment, removing all screens finer than 50-mesh. Apply nematodes in early morning or evening in a high volume of water to already moist soil, pre-irrigating if needed. Apply another 1/4 inch of irrigation after application to wash them onto and into the soil. Although references suggest rates of several billion nematodes per acre, I found researchers and suppliers recommended 250 (if banded in the row) to 500 million per acre, at a cost of about \$100-200 acre depending on volume and source. Green Spot says their formulation requires lower numbers of nematodes but the cost ends up about the same. Paradoxically, nematodes probably work best in the worst weevil-infested fields. High populations of weevil larvae allow explosive growth in nematode populations, while low populations of larvae may not permit efficient nematode reproduction. Strawberry plants can recover their vigor remarkably well if crown feeding has not occurred and diseases haven't taken over the roots.

Root weevils cannot fly, so they infest new plantings by wandering into fields from surrounding weedy and woodland vegetation, or in large numbers from recently plowed, infested strawberry plantings. Even plantings several hundred feet away can become generally infested as a result of mass migration from plowed fields. A good rotation program with substantial distance between strawberry fields can help to manage root weevils. Also, when turning under old, infested strawberry plantings, it is critical to leave a row or two at the perimeter of the field as a trap crop to protect other plantings. Adult weevils will be intercepted in these rows before they leave the field and thus lay their eggs where the larvae will not do any damage. At the end of the season the trap rows should be turned under prior to planting winter rye. Do not spray the trap rows as this may repel weevils and result in more migration to other fields.

Some Beneficial Nematode Suppliers:

1. *Green Spot*: 603-942-8925 or www.shopgreenmethods.com
 2. *Griffin Greenhouse Supplies*: 978-851-4346 or www.griffins.com
 3. *Integrated Biological Control Systems*: 888-793-4227 or www.goodbug-shop.com
 4. *Koppert Biologicals*: 800-928-8827 or www.koppert.com
- (*Source: Vermont Vegetable and Berry News, July 15, 2002*)

Blueberry

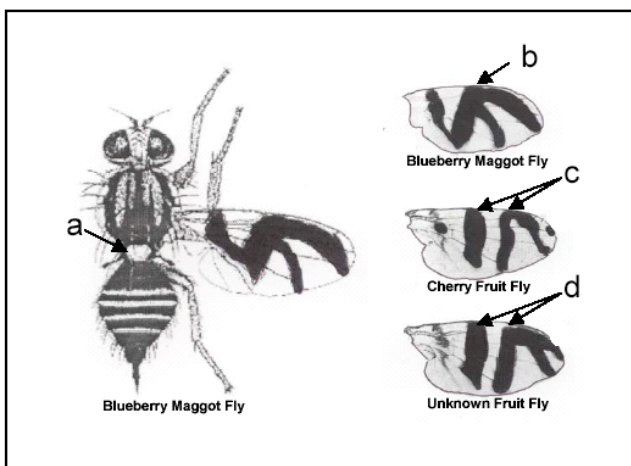
Identification of Blueberry Maggot Adults on Sticky Traps

Sridhar Polavarapu, James Barry, Luis Teixeira, Rutgers University

Several cases of misidentification of blueberry maggot flies on yellow Pherocon AM sticky traps have come to our notice in the past few weeks. Misidentification of blueberry maggot flies on traps can trigger unnecessary insecticide sprays and cost time and money to growers. It is important that you consult one of us if you are not certain of the identity of flies on the monitoring trap so that you will not call for sprays for capturing fruit flies that cannot reproduce on blueberries.

It is possible that baited sticky traps placed in highbush blueberry fields capture several species of fruit flies in addition to the blueberry maggot fly adults. However, the blueberry maggot is the predominant fruit fly pest found in most blueberry fields. In some cases there are other flies, which appear similar to the blueberry maggot, which may also show up in the baited sticky traps used for monitoring. The presence of these other flies is a result of movement from adjacent areas where other host plants are found, as none of them are able to reproduce on blueberries.

The noticeable white dot between the thorax and abdomen (a) and the pattern of the black bars on the wing (b) are good characteristics for identifying blueberry maggot. Eastern cherry fruit fly, which attacks the berries of black cherry (in addition to sweet and sour cherries), has vertical bars that do not cross and connect (c). Another unknown species of fruit fly also has these same vertical bars (d), but lacks the small dark spot as in cherry fruit fly. Apple maggot fly has an identical wing pattern making it indistinguishable from blueberry maggot in the field, but it is found on different host plants (ex. hawthorn, apple, cherry, pear).



The identity of fruiting trees located in neighboring fields and abandoned/wild areas, may give an indication of what species could be potentially confused with blueberry maggot. (*Source: The Blueberry Bulletin, July 25, 2003 Vol. XIX, No. 15*)

Brambles

Cane Borers

Rick Foster, Purdue University

I have received several reports of cane borers in raspberries, especially in the southern part of the state. There are two primary species of cane borers. The raspberry cane borer attacks the tips of the canes, and may bore all the way down to the base. The damage usually shows up in June as wilting tips. The best cultural control at this point is to prune out the wilting tips to several inches below the symptoms and destroy those prunings. The red-necked cane borer generally attacks closer to the base of the plant and the infested canes form galls that show up in July and August. The infested canes should be pruned out in late fall or early spring. Insecticidal control should be done just before bloom, so it is too late to use insecticides for this year. (*Source: Facts for Fancy Fruit, FFF03-08, Fri, 25 Jul 2003*)

Orange Rust of Brambles

Jim Travis, Jo Rytter, Ken Hickey, PennState University

Orange rust is a fungal disease which occurs only on brambles, particularly blackberries, dewberries, and black raspberries. This disease is not known to affect red or purple raspberries. This is a systemic disease. Once the plant is infected, the entire plant is infected for life.

Symptoms

The diagnostic symptoms of orange rust occur early in the spring when the new shoots begin their growth. The new leaves are stunted, deformed, and pale green or yellowish. Waxy blisters cover the undersides of the leaves. These blisters later become bright orange and powdery, the characteristic which gives the disease its name. Canes produced on the diseased plants may appear healthy. However, these infected canes are usually spineless and do not produce blossoms. The diagnostic orange pustules will be produced on the leaves of these canes the following spring. Infected plants generally take on a bushy appearance as many short upright shoots arise from one bud.

Disease Cycle

Orange rust is caused by the fungus, *Arthuriomyces peckianus*, which overwinters in the diseased roots and canes. Orange rust is generally favored by low temperatures and high humidity. When the orange spore pustules mature and break open in June or July, the spores are spread to other plants by the wind. The fungus enters the plant through the leaves and grows internally through the canes, crowns, and roots. Newly infected plants seldom show symptoms until the following spring.

Orange rust is a systemic disease. Once the plant is infected, the entire plant is infected for life.

Disease Management

Many initial problems in the bramble planting can be prevented by starting with certified, disease-free nursery stock. Inspect all plants in the spring for symptoms of infection. As soon as symptoms of orange rust are detected, remove the entire plant. Remove and destroy all wild blackberries and raspberries in the area which may serve as a source of disease. No chemical control is known for this disease. Some blackberries specifically Eldorado, Raven, and Ebony King, are reported to exhibit resistance. (*Source: PennState Dept. of Plant Path. Small Fruit Fact Sheet Series <http://cygnus.tamu.edu/Textlab/Fruit/Blackberry/bbtop.html>*)

Raspberries and Blackberries Get Fire Blight, Too

Annemiek Schilder Michigan State University

While fire blight is most common in pears and apples, it also occasionally affects raspberries and blackberries (*Rubus* spp.). Certain varieties (e.g. Boyne raspberries) are particularly susceptible. Losses result from fruit infection and from death of tips of primocanes. Fruit losses of 65 percent or more have reported on thornless blackberries in Illinois. Flowers, fruit, cane tips and succulent shoots become infected, initially appearing water-soaked but eventually turning brown (fruit) or purplish black (shoots and cane tips). Primocane tips often curve and take on a shepherd's crook appearance. Infections may proceed down the cane for up to eight inches and may produce abundant bacterial ooze under high moisture conditions. Flower blight symptoms may be confused with those caused by *Botrytis*. Infected berries do not mature. Instead, they become brown, dry and very hard, and remain attached to the pedicel. Entire fruit clusters may be infected, but generally a few berries in each cluster remain healthy.

The causal agent is the same bacterium causing fire blight in apple and pear, *Erwinia amylovora*. However, apple and pear isolates are not pathogenic on Rubus and Rubus strains infect Rubus spp. only. The bacteria are thought to overwinter on cankers on canes. Bacterial populations increase early in the spring and are moved by rain splash or insects to healthy canes and fruits. Moderately warm weather (65-77° F) and light rain enhance infection. No control measures have been developed because of the sporadic nature of the disease. However, pruning to remove infected tissues by pruning and facilitate rapid drying of the canes and foliage help reduce the likelihood of infection. If you are experiencing a persistent problem with fireblight, copper might be an option. However, crop injury may result. (*Source: Michigan Fruit CAT Vol. 16, No. 14, July 10, 2001*)

Grape

Grape Update

Alice Wise and Wayne Wilcox, Cornell University

Week of July 21: Cluster closing was imminent or achieved this week, at least in Chardonnay and Pinot Noir. Some clones of Chardonnay set almost too well, clusters are setting up to be very compact. In leaf pulling, we were able to see that set was a little more erratic in Merlot. In one section of the vineyard where the same clones are replicated on different rootstocks, Merlot 1, 3, 8 and 9 on 3309 set very well. On 101-14 in an adjacent row, the same clones had abysmal set. Growers are hedging, leaf pulling and cluster thinning.

Pest Update: The extended very humid, cloudy period with intermittent rain July 22 - 24 will precipitate downy mildew. At the research vineyard, we found a small but not insignificant no. of Chardonnay clusters with up to six actively sprouting Botrytis berries. Time for a well-applied cluster closing Botrytis treatment; this is best applied to blocks that have been leaf pulled. Infection at this time of year is worrisome though if conditions are not exceedingly wet in Aug and Sept, these preveraison infections will not amount to much. Leafhoppers and beetles are still around, no reports of mites.

Downy Mildew And Phosphorous Acid: Wayne Wilcox recently made these comments: "Regarding DM, I should note that we just evaluated a field trial examining the protecting and postinfection activities of a phosphite (phosphorous acid) product for control of DM. Sprays were applied 7 days before, 3 days before, or 3 days after inoculation with a 'lot' of sports (the youngest 2 or 3 leaves on unsprayed plants were destroyed, the next 2 or 3 were also hit hard). Sprays 3 days before infection gave virtually complete control. Sprays applied 7 days before infection gave very good to excellent control on the youngest (most susceptible) leaves, but were less effective on leaves 4 or 5 nodes downy from the tip (the material is very mobile in the plant and apparently gets shipped out to the 'sinks' such as growing tips). Sprays applied 3 days after infection gave very good control, particularly on the youngest leaves. Bottom line: Phosphites appear to provide both protective and postinfection activity against DM. I suspect that the 7-day protectant assay would have looked even better if we had challenged the plants with a more realistic level of inoculum, rather than the 50,000 spores per leaf (!) that we used."

PS from AW ? We are not aware of any tank mix incompatibilities with PA products. There have been a lot of questions on this.

"Alternative" Materials For Powdery Mildew Control: Geneva grape pathologist Wayne Wilcox reviews some of the lesser known powdery mildew products.

In recent years, a number of products other than traditional fungicides have been registered to control powdery on grapes. They work, to variable extents, but it helps to understand why. Powdery mildew (PM) is an unusual disease, since the fungus that causes it lives almost entirely on the surface of leaves and berries (the powdery stuff you see when control breaks down). Thus, it is "naked" and subject to (temporary) eradication following topical treatment with a range of products that don't affect other disease-causing fungi. These do their dirty work down inside the plant tissues, where they're protected from such treatments.

Below is a brief rundown on some of the "alternative" products that have been registered by the EPA for PM control, and what we know about them. Some of the more "esoteric" may not yet be registered in NY State.

- **JMS Stylet Oil.** Well known, often discussed, and frequently used on Long Island. It does provide limited protective activity (about 4 days in one study) against new infections, but is most effective when used after infection has occurred, particularly within the first week after infection occurs (again in our region, virtually every day from late spring through the summer is a PM infection period). A good reason not to stretch intervals too far.

Although Stylet Oil also is registered for control of Botrytis, we've never obtained any control in our Botrytis trials with this product. Recall from earlier meetings and newsletters that berries infected with PM are exceptionally susceptible to Botrytis infection. Thus, controlling PM with Stylet Oil or other "alternative" products eliminates this one route of attack by Botrytis, but I've seen no convincing evidence that they otherwise protect against Botrytis, when predisposition by PM isn't a factor.

- **Nutrol** (monopotassium phosphate). We've been working with this dual purpose material (foliar nutrient plus powdery mildew fungicide) every year since 1996, with moderately good results. In greenhouse tests of how it works, we've found that Nutrol provides little protective activity; that is, no significant control if it's applied before plants are inoculated with powdery mildew spores. In contrast, it provided significant control when applied within 3 - 5 days after exposure to the spores, i.e., when applied directly to the developing PM colonies. This is probably akin to what happens when one pours salt on a slug: it sucks the water (and life) right out of the treated organism.

This scenario suggests that Nutrol should be more effective when applied relatively frequently (repeated knock-downs), rather than relying on long periods of protectant activity between sprays. So for the last 2 seasons of field trials, we've compared 8 lb/A on a 14-day schedule versus 4 lb/A on a 7-day schedule (same amount of product per season, but more "hits"). In both years, the more-frequent schedule was significantly more effective.

I strongly suspect that this same general principle (one-shot knock-down against young colonies, with little subsequent protective activity) will apply to most of the "alternative" PM control products as well ? Kaligreen, Armicarb and Oxidate as well as Nutrol.

- **Kaligreen, Armicarb 100** (potassium bicarbonate). Baking soda (sodium bicarbonate) controls many powdery mildews, but excessive sodium is phytotoxic; hence, these potassium bicarbonate products have been developed to do the same thing without the phyto. We haven't worked with Kaligreen (although trials are now underway), but Armicarb 100 has performed similarly to Nutrol in field trials. Photos in the trade press showing dead PM fungus on treated plants also is consistent with the activity we've seen from Nutrol (topical, eradicated effects; salt-on-a-slug). Comments from those familiar with pest control in CA indicate that Kaligreen is commonly used there to arrest PM infections.

- **Oxidate** (hydrogen peroxide). Registered for control of powdery mildew and Botrytis. We haven't worked with it. I believe the claims for PM control, but doubt those for Botrytis (see above).

- **Trilogy** (neem oil). An extract from the neem tree, was certified for organic production last I knew. We haven't worked with it. Data from Oregon State University show some efficacy, but not as active as Stylet Oil.

- **Serenade.** The active ingredient is an antibiotic from the soil bacterium *Bacillus subtilis*. One formulation sold in NY is certified organic. Experiences with Serenade have been mixed. Data from CA has indicated good PM control. In trials at Geneva, PM control has been "fair", control of Botrytis and sour rot has been nil. Last season on LI, we were not able to evaluate PM control; Serenade did not control sour rot. To the company's credit, they have sponsored research throughout the east to attempt to find a "good fit" for Serenade.

- **Harpin.** Harpin is a unique bacterial protein that "turns on" natural defense mechanisms in some plants. Although this approach to grape disease management sounds attractive, our early efforts to utilize it with harpin and another (unregistered) product have not been very successful. That doesn't mean that it doesn't work, just that we haven't been able to make it do so yet. If curious, you might want to look at it on a small trial basis.

FINAL NOTE: All of these materials are likely to be most effective if used in a rotational program with conventional PM fungicides. Also, note that many of them (esp. the salts, oils, and peroxide) work via direct contact with the growing PM fungus. Thus, thorough coverage is critical. Don't waste your time and money if you can't provide it. Also, apply these post infection materials as soon as an infection is noted. It is unrealistic to expect control of a raging PM infection. (Source: *LI Fruit & Vegetable Update, No 19, July 25, 2003*)

Japanese Beetles in Grapes

Rick Foster, Purdue University

Japanese beetle adults are out in full force throughout the state. The reports vary from location to location, with some people reported lower populations than normal and others reporting very high populations. Japanese beetles can be very problematic for fruit growers. The beetles feed voraciously on the leaves of many different fruit crops. The most serious damage, of course, comes when the beetles damage the fruit. There are a number of insecticides that are effective against Japanese beetles. One that is commonly used by many growers is Sevin (carbaryl). Using Sevin on tree fruits is usually no problem, since the PHI is 3 days, which is about the expected effective life of the insecticide. However, the PHI on small fruits is 7 days, which can be a real problem during harvest season. Over the past two seasons, I have had good results using products that contain neem (azadirachtin) such as Neemix or Align. Neem has little or no toxicity to the beetles, but does seem to act as an effective repellent. It is best to apply the neem before large numbers of beetles are present on your crop. If you use it, don't expect to see immediate results. It may take a few days for the beetles to leave the plants. However, even with several heavy rains, I have seen over a week of good repellency. Neem has a 0 day PHI and a 12 hour REI for small fruits. A reasonable approach during harvest would be to spray after you finish harvesting for the day, which will give plenty of time before the next day's harvest begins. (*Source: Facts for Fancy Fruit, FFF03-09, Fri, 25 Jul 2003*)

Minor Fruits:

Elderberries (*Sambucus*, spp.)

Marvin Pritts, Cornell University



Elderberry Blossom

Elderberries are popular for their unusual taste in pies, jellies, and jams. They are occasionally used in winemaking. The plants are very hardy (usually to Zone 4 but some kinds to Zone 3), and because they flower in late June, the crop is seldom damaged by late spring frost.

They are attractive and easy to grow, and are great in landscape plantings. Elderberries contain more phosphorus and potassium than any other temperate fruit crop. The fruit is also rich in vitamin C.

Planting

Elderberries grow best in moist, fertile, well-drained soil with a pH between 5.5 and 6.5, but will tolerate a wide range of soil texture, fertility, and acidity. It's a myth that they prefer swampy areas. In fact, they do not tolerate poor drainage. Plant elderberries in spring, as soon as possible after they arrive from the nursery to prevent plants from drying out. Space plants 6 to 10 feet apart. Elderberries are shallow rooted, so keep them well-watered during the first season. Plants are easy to propagate from hardwood cuttings taken when plants are dormant.

Fertilizing

Elderberries respond well to fertilization. In addition to incorporating manure or compost before planting, apply additional fertilizer annually in early spring. Apply 1/8 pound of ammonium nitrate (or .5 lbs. 10-10-10) for each year of the plant's age, up to one pound per plant (or up to 4 lbs. 10-10-10).

Weed Control

The most difficult problem faced when growing elderberries is weed control. Because they have shallow roots, do not cultivate deeper than 2 inches. After the first year, it is best to avoid disturbing the soil at all because the slightest injury can damage the fibrous root system or kill one of the new upright shoots. Use a combination of pulling weeds by hand while they are still small, mowing and mulching to control weeds without disturbing the elderberry roots. Once you develop a thick hedgerow of plants, elderberries can suppress weeds quite well.

Harvest

Harvest elderberry fruit in late August through early September, depending on the cultivar. When ripe, the entire cluster should be removed and the berries stripped from the cluster for use. Uncooked berries have a dark purple juice and are astringent and inedible. Use the fruit as soon as possible or keep it at a cool temperature for later use. It is difficult to transport elderberries because the fruits fall off the cluster during transit.

Pruning

Elderberries send up many new canes each year. The canes usually reach full height in one season and develop lateral branches in the second. Flowers and fruit develop on the tips of the current season's growth, often on the new canes but especially on laterals. Second-year elderberry canes with good lateral development are the most fruitful. In the third or fourth year, older wood tends to lose vigor and become weak. In late winter to early spring while the plants are dormant, remove all dead, broken or weak canes, plus all canes more than three years old. Leave an equal number of one, two, and three-year-old canes.

Choosing Cultivars

Individual flowers are small, white, and borne in large compound clusters. They are nearly self-unfruitful, so plant two different cultivars within 60 feet of each other to provide adequate cross-pollination. 'Adams No. 1' and 'Adams No. 2' are two old cultivars, introduced by the New York State Agricultural Experiment Station in 1926. They are strong, vigorous, productive, hardy to Zone 4 and bear large fruit clusters. They also ripen late, with fruit maturing in early September. Other cultivars with large clusters and berries include 'York', 'Johns', 'Kent', 'Nova', and 'Scotia'. 'York' is somewhat more productive than the Adams series, and the berries tend to be larger.

Diseases and Insects

Elderberry plants are generally free of pests, which makes them great for landscape plantings. Powdery mildew is a problem in some years, especially when it affects the fruit. Cane borers occasionally cause damage, but are usually not present in large numbers. Pruning out infested canes is the best remedy for home gardeners. (*Source: Cornell University Small Fruit Web page for Minor Fruits: <http://www.hort.cornell.edu/extension/commercial/fruit/mfruit/>*)

General Information

Summer Softwood Propagation

John Avery, University of Missouri

This article deals with propagating plants during the active growing season - while the wood or outer bark of the plant is succulent, the growing tip is generally still expanding, and leaves are present on the plant. You will need to know the time of year in which best success will be achieved with the particular species you want to propagate. Some sort of humidity controlling apparatus will be needed to keep leaves from losing water faster than the rootless cutting can take water up. Care of the newly rooted cutting is critical to your success. Also keep in mind that a number of new cultivars are plant patent protected and it is illegal to propagate them without written approval from the patent holder.

The first step after you decide to become a plant propagator, whether as a hobbyist or as a commercial operator, is to obtain a good plant propagation book. A good reference will give you basic information on propagation as well as references to propagation on many different species and cultivars of plants. The book that I like and use is "The Reference Manual of Woody Plant Propagation: From seed to tissue culture" by Michael Dirr and Charles Heuser. Another good reference book is "Plant Propagation" by Hartmann and Kester.

There are too many different species and cultivars of landscape, fruit, or houseplants to make generalizations about producing new plants from cuttings. A good reference is essential to find information on the specific plant you are dealing with, the best time in summer to take cuttings, what hormone concentration to use if hormones are needed at all, and care of the new plants after rooting takes place. Timing of propagation is critical for a specific species or even for a cultivar within that species. For example in the maples April to mid-June is the preferred time to propagate this group. The new plants need a long time to develop the new roots and to grow before winter. New plants should not be transplanted or otherwise disturbed after rooting, as winterkill will be high. The barberries, however, can be propagated anytime during the summer even into late August or early September and will winter well and grow the next spring. It should be noted that most species would not do well when the base of the cutting is new and very succulent. Most propagation should be held off until the base of new growth has had time to mature. The best way to determine if the basal area is mature enough is to compare the light green to yellowish immature wood at the growing tip with the darker

green mature wood on the mother plant. Many species will also have some reddening or browning of the wood as it matures.

Hormone application is critical to the rooting of many species. There are some plants that will root without the need of



John Avery happily puts grape softwood cuttings under the mist.



Inspection of newly rooted gooseberry cuttings.

additional hormone. Some of these species are the ground covers and shrubs. Other species will require low to medium concentrations of hormone and a few will need high concentrations for best rooting. A word of caution on hormone, "more is not always better." In the references concentrations will

be given for each species. These have been discovered over time with lots of research and painstaking work. Follow the references closely because doubling the hormone might kill the new cutting instead of increasing rooting.

In reference books hormone concentrations will be referred to by two different methods. Sometimes authors list the hormone concentration by percentage of hormone in the solution but many time it is listed by parts per million (ppm) in the solution. A simple way to convert ppm to percentage is to remember that 1000ppm is 0.1% concentration. This is the concentration at which a number of plant species will root best during propagation. Hormones can be purchased in two formulations, either a dry talc powder or a liquid mix, from nurseries or their supply companies. The powder formulations will be given as a percent hormone concentration usually with a range of 0.1% to 1%. There is not much choice or variation in the powder formulations of hormone. The liquid formulations come in a concentration of 1 to 1.5% and then are diluted to the concentration desired for the species being propagated.

The second step in propagation is obtaining an apparatus to control water loss in the cutting while rooting takes place. For the hobbyist this could be as simple as a zip lock bag with a pot of rooting media placed in it. Generally, the one-gallon zip lock bags with a small 4 to 5" pot and soil-less media will work to root one to three cuttings. Remember to wet the media very well and let drain good before placing in the bag as a dry media will desiccate the cutting or a waterlogged media will drown the cutting before it can root. For somewhat larger propagation projects a tent made of clear plastic can be used to control humidity around a number of cuttings in plant trays. A word of caution, do not place the bag or tent in a window where direct sunlight can hit it. The inside of the tent or bag will heat up very quickly and steam the new cutting to death.

For those with a major project, a mist system can be setup outside or in a greenhouse. When a mist system is set up outside there needs to be a windbreak to keep the mist on the cuttings when there is a breeze and some shade to keep the leaves from drying in the direct sun. When set up in a greenhouse air movement is not a major concern but shading is still needed during the hottest part of summer.

There are two types of misting systems available to propagators. The first is an automatic leaf type system. The controller is setup under the mist and has a stainless steel wire mesh leaf that controls a switch, which turns on a solenoid. When the leaf is wet it falls down, turning off the water. As the water evaporates from the leaf it raises thus opening the solenoid and misting the leaf. The leaf and its counterbalance are adjusted to your conditions so that the plant leaves are kept moist at all times. This type controller works very well but in hard water situations the controller leaf must be cleaned frequently or it will become weighted down with lime and not function properly. The other system is a timer-controlled system. The first timer is a 24-hour timer to operate the mist system during the day light hours. The second timer is a short cycle timer connected in series with first timer to control the solenoid. The short-cycle timer cycles over a set time frame such as every six minutes and has thumbs to turn the solenoid on for a set period such as 6 seconds. This allows the operator to set a misting cycle to the best conditions for plants he is propagating. An example would be to have the mist system on from 6 am to 8 pm and to mist the cuttings for 12 seconds every 6 minutes.

Once cuttings have rooted, the new plants need to be removed from the mist system and encouraged to start new growth. The humidity around the new plants will need to be reduced over a period of time, usually three days to one week is sufficient. The period of time for acclimation is determined by the species being propagated. For example, greenwood grape plants can generally be removed from the mist immediately upon rooting. The new plants only need a couple of days shade before being placed out in full sun. If the new plant was rooted in a low light environment then care should be taken to acclimate it to direct sunlight again. Once the plants begin new growth they can be planted directly in the nursery or vineyard. On the other hand the maples as stated earlier need special care their first summer or winter death will be high among the new trees. Once rooting has taken place the misting interval should be reduced over a week or two. The new trees should be shaded for a couple of weeks after removal from the mist before going outside into direct sun. The new trees should be left in their propagation pots for the first winter and protected from severe cold. The new maple trees should be encouraged to start new growth though by the addition of fertilizer to the watering schedule. Care of the newly rooted plant is just as important as the first steps in the propagating sequence.

You can see from these two examples that each species has its own requirements for successful summer propagation. The reference books should be followed closely when propagating the desired species/ cultivar. Keep in mind that not all species of plants can be propagated from softwood cuttings.

For the adventurous among us, there are species we can experiment with because there are no set procedures for propagation yet. We can discover what works! (*Source: Missouri Berry Basket, Summer, 2003*)

Cover Crops: Hairy Vetch

Frank Mangan, University of Massachusetts

Now is the time to think about cover crops for the fall, especially if you need to order the seed. One of the more common cover crop choices for Massachusetts is hairy vetch.

Hairy vetch can be seeded up to mid September and will survive the winter. Growers near the coast or on the cape and islands can seed vetch up till October or even later. When left to grow long enough in the spring, hairy vetch has supplied over 100 lbs./acre of nitrogen.

It is very important that the appropriate rhizobia species is used for hairy vetch (the rhizobia for hairy vetch will work for all vetches and peas). Without the rhizobia the vetch will not give the desired effects.

We have been recommending you mix the vetch with either winter rye or oat. There are several reasons for this:

1. Both oat and winter rye are very efficient in taking up nitrogen from the soil (remember, the vetch is getting most of its nitrogen from the atmosphere, so it does not need much from the soil). By taking up more nitrogen in the late summer and fall we are reducing the risk of contaminating surface or ground water and the nitrogen is recycled so that it can be used by next years cash crop.
2. The oat and rye can produce tremendous amounts of valuable organic matter if allowed to grow long enough.
3. Both of these cover crops will give better erosion control than vetch alone since they emerge and establish themselves more quickly than vetch. This is especially important when vetch is seeded after September 1.

We have been recommending 40 lbs./acre of oat or rye with 30-40 lbs./acre of hairy vetch. If you are using a grain drill then you can use seeding rates as low as 30 lbs./acre of vetch. If you are spinning the cover crop on and lightly disking it in then a rate of 35 - 40 lbs./acre is suggested.

Many growers prefer the use of oat rather than rye because of the tremendous growth of rye that occurs in the spring. This can be desirable if you are looking for increased organic matter in your soils, however some growers find the amount of biomass created by these two cover crops too much to handle. In addition, we have found that we get much more growth of the vetch in the spring when seeded with oat than when seeded with rye. The rye will compete with the vetch in the spring. (*Source: Massachusetts Vegetable Notes, July 24, 2003 Vol. 14, No. 10*)

Meetings

TWILIGHT MEETING at 4TOWN FARM

Wednesday, August 6, 2003

Join us for an exciting twilight meeting at 4Town Farm hosted by the Clegg family on Wednesday, August 6th. The farm is located in Seekonk, Mass., which is about an hour from metro Boston or Worcester. There is plenty to see and experience at this 200-acre vegetable and small fruit farm.

Mini trade show: We have invited several commercial agricultural suppliers to set up displays from 5:00 – 5:45. This will include Charles Harris Irrigation Systems and DeCran Agricultural Supplies, Inc.

Food: Light refreshments will be available starting at 5:00, compliments of 4Town Farm.

Farm Tour: starts promptly at 5:45. Topics include:

1. Tour of farmstand
2. Pick-your-own flower operation
3. Mechanical carrot harvester
4. Stale seedbed technique for weed management on greens
5. Different application methods for Admire
6. Mesclun production in greenhouse
7. Mums, sunflower and gladiola production
8. No-till system for pumpkins using hairy vetch and oats
9. Overview of irrigation system for 200 acres
10. Mechanical bean picker
11. New Morton Building
12. Mechanical corn harvester

Directions: Take 195 to Rte. 6. Take Rte. 6 east from Seekonk exit and west from Swansea exit to Warren Ave. (you will see a Cumberland Farms on the corner). Proceed * mile down Warren Ave. to George St. 4Town Farm is on the right.

Contact Frank Mangan (978 422-6374) or 4Town Farm (508 336-5587) for more information.

NOFA 29TH ANNUAL SUMMER CONFERENCE

Does a presentation about the Northeast Organic Dairy Producers Alliance whet your appetite or does one on moving From Hopelessness and Guilt to Peace? Would you like to know The Story of Garlic or do you need to study up on Pests and Beneficial Insects? Is it an Introduction to Permaculture that you need or is it Writing an Annual Budget for a Farming Operation? Tool Sharpening or Marketing Meat? Do you want to learn about The War on Farmers in Colombia or Stone Wall Building? Or maybe none of these are what you're looking for? There are dozens more workshops to choose from in all of the 8 one-and-a-half-hour slots. And if none of the workshops lights your fire (highly unlikely) or if you just need to do something else, there's always great films to watch, hanging out under the exhibitors' tents, swimming at a local swimming hole, networking with other folks, and many other things to do.

This year's debate - The National Organic Program: Should We Jump Ship? - is sure to be top notch and draw lots of folks with strong opinions.

Our old-fashioned country fair needs no introduction for those who have seen it, but for those who haven't suffice it to say it's everything a fair should be. The fair has fun for all, without all of that waste and bad food. Proving that we are not just trying to cause you anxiety in choosing what workshops to attend, there'll be a difficult choice to make during the fair as well. Play games (blueberry pie-eating contest, tomato bob, egg toss, anyone?) or watch Oilgarchy, another

awesome politically-charged production by the locally-based Liberty Cabbage Theatre Revival (performers of last year's A Sense of Humus). Oh, the choices, the choices.

*Northeast Organic Farming Association
August 8th through the 10th, 2003
At Hampshire College, Amherst, MA*

For more information, go to <http://www.nofaic.org/conference>
Contact: Dennis or Audrey Cronin at 508-799-2278 or nofareg@juno.com or Julie Rawson & Jack Kittredge at 978-355-2853 or nofa@nofamass.org
(Source: Massachusetts Vegetable Notes JULY 24, 2003 VOLUME 14, NUMBER 10)

Upcoming WEED IDENTIFICATION Workshops from UMass Extension's Landscape, Nursery and Urban Forestry Program

August 27 - UMass, Amherst
September 24 - Elm Bank, Wellesley, MA

Correct weed identification is an important first step in the development of an effective weed management program. Using a classroom presentation, potted weed herbarium and weed walk, UMass Extension Educator Randy Prostack will help participants enhance their weed identification skills. Feel free to bring a weed or two to identify. Workshop held rain or shine (lunch not provided), 9 am - 3 pm. Cost \$90/person (pre-registration required, space is limited).

3 pesticide contact hours available; MCA, MCLP, and MCH credits will be offered.

Registration Form - Send to: Weed Workshop, UMass Extension, French Hall, 230 Stockbridge Rd., Amherst, MA 01003. Directions sent upon confirmation or go to www.umassgreeninfo.org. Make checks payable to UMass.

Name(s) _____

Company _____
Address _____
City/State/Zip _____

Daytime phone # _____
Fax # _____
E-mail address _____

Date you wish to attend: ___ 8/27: Amherst ___ 9/24: Wellesley

Municipalities may preregister using a PR or PO # and fax those registrations to (413) 577-1620.

PR/PO#: _____

Do you need an invoice sent to process this PO? (Circle one) YES / NO

Kathleen Carroll, UMass Extension's Landscape, Nursery and Urban Forestry Program
French Hall, 230 Stockbridge Rd.
Amherst, MA 01003-2910
Tel. (413) 545-0895, Fax. (413) 577-1620, www.UMassGreenInfo.org

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.