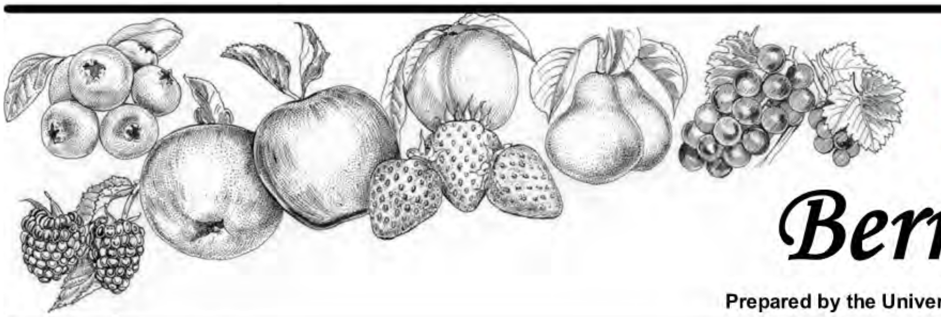

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IN THIS ISSUE:

Message from the Editor

Pesticide Applicator Licenses and Recertification: We encourage anyone who applies pesticides on commercial crops to obtain a pesticide applicators license. While it is required only for certain circumstances or for use of certain types of pesticides, being able to document training in safe mixing, loading, and application procedures can be useful when dealing with the public. In order to find out how to obtain a pesticide applicators license or to find opportunities to earn recertification credits if you have a current license, check out the UMass Extension Pesticide Education website at

http://www.umass.edu/pested/index.htm.

There you will find information on:

- **Licensing Information**
- **Training Workshops to Prepare for Exams**
- **2008 Pesticide Exam Schedule**
- **Directions to Exam Sites**
- **Examination Study Materials**
- **Recertification Training Workshops**

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STRAWBERRY

Straw Removal on Strawberries

Bruce Bordelon, Purdue University

Studies done in Illinois indicate that proper time to remove straw from matted row strawberries is when the bare-soil temperature at 4 inches averages about 40-43?F. This usually coincides with mid to late March in central Indiana. Plants will begin pushing new leaves as the soil temperatures rise steadily through the month, so the straw should be raked off the tops of the beds and into the row middles. Leaving some straw on top of the beds for plants to grow up through provides a clean surface for fruit. Straw should be removed from strawberry beds before the plants grow enough to cause yellowing of foliage. Allowing the leaves to become etiolated (yellowed with long petioles) due to late straw removal can reduce yields by as much as 25%. However, uncovering the plants early may promote early growth and increase chances of frost or freeze injury. The Illinois research found that the difference between early removal and late removal increased first harvest by only 3 days, so there is no real advantage. After the straw is removed the frost protection irrigation equipment should be set up and tested. (***Source****: Facts for Fancy Fruit 07-01, March 22, 2007*)

RASPBERRY

Rotating Cross Arm Trellis and Cane Training for Brambles

Fumiomi Takeda, USDA-ARS Appalachian Fruit Research Station, West Virginia

Blackberry fruit are delicate and too fragile for long distance transport and their production is still low in areas where low winter temperatures cause injuries to canes and buds. It may be possible to overcome the lack of cold hardiness with minimal winter protection and thus meet the local demand for fresh blackberries. Interest in growing blackberries is especially high among small and part-time farmers looking for crops with a market niche and the potential for high returns on investment.

For Commercial blackberries to thrive in northern states, the following criteria need to be met: 1) new varieties with greater winter hardiness and chill requirement, or early-season primocane fruiting habit, 2) protected cultivation under glass or using a pot production system; 3) a simple, low cost technique for modifying the micro-environment to protect blackberry canes to some extent from winter temperatures; and 4) a trellis design and cane training techniques to improve harvest efficiency and be compatible with the winter protection strategy. In short, the goal is to have systems decrease environmental stress or mitigate conditions that are extraordinarily unfavorable for growth. This strategy will involve crop improvement through breeding and biotechnology to adapt the plant to environmental limitations and physically modifying the crop environment to reduce weather stress. Although it is understood that a new approach will need economic and technological analyses, my presentation here is limited to the potential use of a specific trellis and cane

Figures 1 and 2: 'Siskiyou' trailing blackberry in early June: Unprotected plants (left) and plants protected by FRC+PE cover (right).

training techniques for protection of blackberry plants through modification of the aerial environment.

A new trellis system called the "rotating cross arm" (RCA) trellis and cane training technique was developed to facilitate mechanical harvesting of fresh market quality with the USDA bramble harvester (Takeda and Peterson, 1999). The RCA trellis system is a modified "Y" trellis, similar to variations of shift trellis designs described by Stiles (1999) at Virginia Tech. Our RCA trellis system allows floricanes and primocanes to be trained on opposite sides of the trellis. The new trellis design positions more than 95% of the fruit underneath the cross arm and increases hand harvest efficiency by 30% or more (Takeda et al., 2003a, b).

Blackberries have low chilling requirements (200-600 hrs below 45oF) and can have their rest requirements met most years by mid-December in New England. After rest completion blackberries de-acclimate rapidly and can resume growth with exposure to warm temperatures. De-acclimated buds are far more susceptible to low temperature injury. At "rest", cultivars can withstand temperatures as low as -9.5oF. Breeders must develop cultivars such as 'Illini Hardy' which needs more days of warm temperatures (growing degree hours) to break bud, combined with high chilling requirements (~1700 hours) of red raspberries, with low temperature tolerance and thornlessness.

In the absence of suitable, winter hardy, high-chill requirement blackberry varieties, one may modify the aerial environment to decrease winter injury and improve potential of sustained crop production. Western trailing and eastern erect thornless blackberries are adapted to canopy manipulation of the RCA trellis. Based on recent research on trellis technology, we hypothesized that RCA trellis and cane training system could provide a practical technique for growing and protecting blackberries through severe winter conditions. A protection system must prevent temperatures of the buds from falling below -10oF during mid-winter and, once the buds are de-acclimated in late winter; reduce exposure of canes and buds to high temperatures with low labor input. During the fruiting phase, the cross arms of the trellis can be rotated to angle the floricanes into a position that makes the fruit easily accessible for harvesting. The same cross arms can be rotated to reposition or lower primocanes in the fall close to the ground so that exposure to winter conditions would be decreased. When the canes are positioned near the ground, much of the planting could be protected by snow or by applying a protective cover over the plants as their height would be decreased from over 6 ft to less than 2 1/2 ft.

The results of our study show that 'Apache' and 'Triple Crown' did not benefit from winter protection covers. Covered and unprotected plants showed little bud damage and produced the same amount. The minimum daily temperatures remained above 0oF from December 2004 to March 2005. Normally these erect cultivars do not show winter damage until temperatures drop below -4oF (Warmund et al., 1992). In January and February 2005, the daily minimum temperatures under floating row cover (FRC) + plastic sheet (PE) cover treatment were about 6oF higher that in the open. The FRC and FRC + PE covers may also have protected canes against wind and desiccation.

In trailing blackberries, tissue damage in plants protected with FRC + PE cover was significantly less than for unprotected plants. In 'Siskiyou' blackberry, more than 90% of the axillary buds on the lateral canes were killed in unprotected plants compared to only 20% in plants protected with FRC + PE. 'Siskiyou' plants that were not protected produced less than 3 lbs fruit per plants compared to about 10 lbs. in plants that were covered with FRC alone or in combination with PE. More fruit were harvested from 'Boysenberry' blackberries that were protected compared to plants in the open. The fruit of 'Boysenberry' blackberry has poor drupe development especially among those at the distal end. Harvesting of 'Siskiyou' fruit started on June 20 during red raspberry harvest season or 2 or 3 weeks earlier than that for 'Triple Crown' eastern blackberry.

The RCA trellis (*photo, left*) which allows the placement

of canes close to the ground in winter and installation of FRC over the canes during winter has potential for reducing low-temperature stress or to mitigate conditions that are unfavorable for growth. In using the RCA trellis for winter protection, the pivot point of the rotatable cross arm should be about 24 inches above the ground. After harvest is finished and spent floricanes are removed from the trellis, the lateral canes can be tied to the wires on the cross arm. In early winter, the cross arm can be rotated away from the harvest position to tie the remaining laterals that have grown to the other side of the row, and rotate the cross arms so that the tip of the cross arm touches the ground. The sequence of cane tying and cross-arm rotation positions all canes at the height of the pivot point or close to the ground. For winter protection, straw mulch can be deposited on top of the horizontally oriented lateral canes and around the base of the main canes. The straw can be covered with winterizing row covers. Snow cover can provide added insulation. Once such a production system is installed, it helps with the re-positioning of the canes without sacrificing the production capacity of the plant and can position nearly all the fruit on one side of the row.

Will these production modifications allow blackberries to be grown successfully in northern states? Higher investment capital on the trellis material can offset labor needs and raise crop productivity. We have shown that the RCA trellis system can be used to manipulate the canes with little can breakage and position fruit to improve harvest efficiency.

Whether incorporating this trellis system for blackberry production in northern states will be successful depends on its profitability. For example, the price of blackberries in New Hampshire is more than $3.00 per pint (William Lord, personal communication). Field trials will be started in Maine, New Hampshire and Utah to evaluate alternative cultural techniques for improving sustainability of blackberry production at sites with adverse winter conditions.

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BLUEBERRY

Soil Management for Optimal Blueberry Production

Marvin Pritts, Cornell University

Demand for fresh blueberries has grown considerably over the past 50 years, and is showing no sign of slowing down. Studies associating consumption of blueberries with health is contributing to this demand, as is the consumer’s desire to purchase locally-grown fruit. To respond to this increased demand, growers are starting to plant blueberries on soils that are less than ideal.

Criteria exist for blueberry soils, and if these criteria are not met, then it is difficult to establish a successful blueberry planting. The first criterion is that the soil be composed of a significant amount of sand to allow for good drainage and pore space. Sands, loamy sands and sandy loams are acceptable. Silts and clays are generally not conducive for blueberry root development because they lack pore space of an appropriate size. Blueberries have extremely fibrous roots that do not penetrate heavier soils and small pores. Blueberry roots require a large pore space in order to lengthen and develop.

Despite the fact that blueberries can tolerate wet soils, root growth is far better on well-drained soils. Clay and silt soils can become compacted, whereas sandier soils tend to be more resistant to compaction and drain better.

A second criterion is low pH. An optimal pH for blueberries is 4.5, with a range between 4.2 and 4.8. At a lower or higher pH, certain essential nutrients become unavailable. One of the most common problems in blueberry plantings is high pH.

When pH exceeds 5.0, the availability of iron becomes limiting and chlorophyll production ceases, leading to interveinal yellowing of leaves and poor growth. Other nutrients also become unavailable at a high soil pH. If the soil pH is slightly higher than desired, sulfur can be added to lower it. The amount of sulfur is dependent on the current pH, the soil type and the cation exchange capacity. Sandier soils require less sulfur to modify than clayey soils.

A third criterion is calcium content. Blueberries do poorly when soil calcium levels exceed about 2,000 lb/A, probably because calcium interferes with the uptake of other nutrients. Even if soil pH is 4.5, blueberry plants will not grow well if the calcium level is high. Unfortunately, growers cannot preferentially remove calcium from the soil. They can inadvertently add calcium, however, if they irrigate blueberry with high lime water.

To summarize, a blueberry soil should be lighter than a loam, have a pH less than 5.0, and have a calcium content of less than 2,000 lb/A. The pH can be changed whereas the other two factors are fixed.

Once there criteria are met, then other modifications can be made to enhance blueberry performance. For example, blueberries can be grown on raised beds to improve drainage. Organic matter can be added to improve moisture and nutrient holding capacity. Ammonium forms of nitrogen can be used to fertilize plants as these forms provide N in a source that blueberry plants can use directly, and ammonium uptake contributes to soil acidification. Blueberries also have a symbiotic relationship with endomycorrhizal fungi in which nitrogen and phosphorus uptake are improved through this association. High organic matter and low fertilizer rates contribute to the growth of these beneficial fungi.

Should supplemental nutrients be required before planting, avoid chloride (muriate) forms of fertilizer. For example, if the soil tests low in potassium, apply potassium sulfate rather than muriate of potash (potassium chloride). Certain ions (e.g. nitrate, chloride) are toxic to blueberry roots.

Incorporated cover crops can provide organic matter prior to planting. Once plants are established, most growers applied wood chips and/or sawdust under plants. This mulch can improve soil moisture, suppress weeds and supply organic matter.

Without the foundation of a good soil, a blueberry planting will not be successful. Planting blueberries in inappropriate soils is one of the most common problems that we are seeing among berry growers. *(**Source**: New York Berry News, Vol. 8, No. 3, March 2009)*

GRAPE

Effect of this Year's Winter Cold on Grapes

Bruce Bordelon, Purdue University

As most growers are aware, the cold events of mid January caused considerable grape bud mortality, especially in the central and northern part of the state. Our preliminary estimates from Lafayette show up to 90% primary bud mortality on cold tender hybrids such as Vidal and Chambourcin. Winter injury in grapes can have a significant impact on fruit yield this year if growers do not adjust their pruning strategy. Growers should assess bud mortality prior to pruning so that adjustments in pruning severity can be made based on the amount of bud loss.

There are very thorough discussions of winter injury to grapes in publications and web sites. For the sake of brevity here, we suggest readers refer to: Winter Injury to Grapevines and Methods of Protection, Michigan State University Bulletin E2930, Zabadal T. et al. 2007 available through MSU Extension (see www.grapes.msu.edu). A good on-line resource is the Cornell Grape Pages (see www.nysaes.cornell.edu/hort/faculty/pool/GrapePagesIndex.html). Finally, the Midwest Grape Production Guide (see www.hort.purdue.edu/fruitveg/) has a discussion of assessing and adjusting for winter injury.

Determining bud mortality

The first step is to determine the amount of bud mortality. A sample of buds must be collected in the vineyard. It is important to thoroughly sample the vineyard to represent all of the variability that is present. Collect a sample of 100 buds. Ten 10-bud canes are usually sufficient. Samples should be collected after the end of the cold period has occurred, brought indoors, and allowed to warm for 24 to 48 hours to make the damaged buds easier to differentiate from live buds. Samples should be representative of the type of wood that will be left at pruning in terms of the node position on the canes.

Bud mortality is relatively easy to detect. Using a sharp single edged razor blade, make a series of cross-sectional cuts across the dormant buds, getting deeper with each cut until the primary bud is exposed. Cutting too shallow reveals only the brown bud scales, and cutting too deeply misses the center of the bud and reveals the basal tissue, which may appear alive even if the bud is not. Live buds appear bright green while dead buds appear brown or black. Sequentially deeper cuts will reveal the secondary and tertiary buds. Secondary buds are often a bit more hardy than primary buds, and often are alive when the primary is dead. Many grape varieties are quite fruitful on secondary buds, so even nodes that have dead primary buds may produce a crop on the secondary shoots. After a bit of practice, it is easy to quickly assess damage to primary and secondary buds. Record the results on a data sheet.

Adjusting pruning strategy

There are methods for calculating exactly how many buds to retain based on bud mortality, but this approach is, at best, a rough estimate of the potential crop from those buds. Nevertheless, it does give some guidelines to follow. This approach does not take into consideration the potential fruitfulness of secondary buds.

-If less than 15% of the buds are damaged you can prune normally.

-If 15-50% of the buds are damaged then you'll want to adjust the number of buds retained accordingly. For example, if 25% of the buds are damaged then 75% are live. If you need 40 buds per vine for the proper crop load then you'll have to leave extra buds to end up with 40 primary shoots. To determine how to many buds to leave, multiply the inverse of the percent live buds (1/.75) times the desired number of buds (1/.75=1.3; 1.3 x 40 = 52 buds).

-If more than 50% of the buds are dead, we advise growers to do minimal pruning now and wait until after bud break to determine where live buds occur in order to have an adequate number for balancing the vines. Prune away only the canes that are unmanageably low to the ground, in the row space, etc. This approach will require considerable extra labor later in the season, but is the only way to assure a full or partial crop this year.

It is important to recognize that vines that have suffered significant bud mortality also likely have significant winter injury to the tissues of the cordons and trunks. This may affect vine management decisions as growth occurs this year and the full extent of the damage is revealed. There may be a need to replace trunks or cordons.

Spring freeze damage can also be a significant economic problem for grape growers. Damage has occurred in Indiana sporadically over the past few years. Damage was severe statewide in 2007. A technique called long pruning or double pruning helps avoid spring frost and freeze damage, especially on varieties that tend to bud out early. The procedure utilizes the apical dominance of buds on the cane. The first buds to begin growing are those on the tip of the cane, while buds closer to the base begin growth later. To perform long pruning, select canes to be used for fruiting spurs during the normal pruning practice, but leave those canes long, with 10-15 more buds than desired. Spurs are normally pruned to 4 to 6 nodes for fruiting, but if they are not cut back, then the extra buds will help delay the development of the desired basal 4 to 6 buds, which helps avoid frost injury. After the date of the last probable spring freeze has passed, the canes are shortened to the desired length to properly adjust the bud number for the vine. Growth of the basal buds can be delayed by as much as two weeks if weather conditions are favorable. While this procedure requires an extra trip through the vineyard, it can mean the difference between a full crop and little or no crop. (***Source***: *Facts for Fancy Fruit, Vol. 9, No. 1, Feb. 2009*)

CURRANTS AND GOOSEBERRIES

Practical Ecology and Management of White Pine Blister Rust in Currants

Kerik Cox and Steve McKay, Cornell University

White Pine Blister Rust in NY White pine blister rust (WPBR), caused by the fungus *Cronartium ribicola*, is a disease of white pine that greatly impacted the white pine industry in the United States. Like other macrocyclic rust diseases (cedar apple rust, wheat stem rust), WPBR needs two hosts in order to complete its life cycle. The hosts in the life cycle of WPBR are pine and members of the *Ribes* genus (currants, gooseberries, etc.). The most common strategy for eliminating this type of rust disease is to kill off one of the two hosts. In the case of WPBR, it was decided that the Pine industry was more valuable than *Ribes* production and as early as April 1917, *Ribes* quarantine and eradication legislation was beginning to be put into effect. From 1961 to 1967, there was a more extensive *Ribes* eradication effort in the US (2, 6). This effort was quite successful in the eastern United States to the point where it was believed that wild *Ribes* posed little danger to the pine industry (2). Eventually, the federal ban on currant production was removed due to the development of rust resistant pines (1, 3). However, individual states still impose severe regulations or bans on currant production. Despite the availability of new scientific data and management practices to mitigate dangers to the pine industry, no revisions to state restrictions on were made for some time (2). In New York, planting restrictions on currant production were first discussed in 1998 (7, 8) and restrictions were slightly revised recently in 2003. Rust resistant and immune *Ribes* varieties do exist, but are often less horticulturally desirable than highly susceptible black currant varieties such as Ben Alder (1). Because of these varietal concerns, the New York State Department of Environmental Conservation has established both currant fruiting and currant quarantine districts (www.dec.state.ny.us/website/regs/part192.html) to allow some currant production in New York.

Currants produce extremely high levels of antioxidants and vitamin C (4, 5), and are becoming increasingly popular according to a report from the New York Farm Viability Institute (10) (http://www.nyfarmviability.org/press-07-26-06.htm). Previously, the crop profile for currants in New York State in 2000 (www.ipmcenters.org/cropprofiles/docs/nycurrants.html) listed total bearing acreage for currants as approximately 9 acres (9). Currently, growers such as Greg Quinn of the Current Company LLC (http://www.thecurrantcompany.com/) and Curt Rhodes of R.H. Rhodes and Sons Inc. are reported to have more than 15 acres each planted to black currants (9, 10), and are continually expanding.

Practical Ecology of White Pine Blister Rust

Understanding the life cycle and ecology of WPBR and the two hosts needed for its survival has led to management practices that are effective for controlling the disease. The disease is also controlled to some extent by environmental factors and even gnats that eat the fungus present on *Ribes* leaves.

Environmental Considerations

- Hot temperatures in the summer can actually kill the infections on *Ribes* leaves preventing further spread of the disease between *Ribes* plants and preventing the development of sporidia which infect pines. White pines have a 20% rate of resistance to WPBR in trees from unselected seed sources. This is increased to as much as 50-75% by selecting seeds from resistant trees. There are no known cases of WPBR overcoming the resistance genes in *Ribe*s. Resistance can be lost in pines, however.
- WPBR infections must have cool temperatures in the 60 to 70 oF range and moisture for 2 weeks to produce the telial columns which produce sporidia in the fall which can infect moist pine needles and become established on the trees. In a dry, warm year infection potential is less, and in a moist cool year infection potential is greater, and even possible in the summer.
- Climate zones have been defined where pines live. They are zones 1(least likely to be infected) to zone 4 (most likely to have conditions for pines to be infected in the Fall). Arborists say that planting of susceptible *Ribes* is least problematic for pines in zones 1 and 4 since in zone 4 they will not become infected, and in zone 1, pines shouldn't be planted due to the high probability that they will become infected from wild *Ribes*.
- Sporidia produced on telial columns on *Ribes* leaves travel from the *Ribes* to pines in Fall normally only travel about 1,000 feet maximum. Pine seedlings are the most at risk, and a border of 1000 feet free from susceptible *Ribes* plants is recommended for nurseries and Christmas trees.
- 99% of infections on pines take place on the lower 9 feet of the trees. Infections that develop at least one foot from the trunk cause death of the branch, but the cankers do not grow back to the trunk.
- Gooseberries seldom have infections that develop spores that can infect pines.

Management Practices to Protect Pines

- Plant a high population of pine seedlings and rust will rogue susceptible trees. Excess trees are thinned out later.
- Plant trees in microclimates less likely to have dew in the Fall. Plant in zones 1 and 4.
- Plant immune *Ribes* varieties and pines from seed selected from resistant trees.
- Plant trees in areas with overstories to avoid free moisture and infections.
- Plant *Ribes* at least 1000 feet from pines.

White Pine Blister Rust Management Trials in Geneva

Now that currants are back on the table, is WPBR still an issue? There are a lot of excellent currant and gooseberry varieties, but not all of them are rust immune. Although we didn't mention it above, WPBR is also devastating to the currant host. Planting highly rust susceptible varieties is still not allowed in NY, but even some of the resistant varieties get some WPBR infection. Over the past seven years, the Geneva experiment station has conducted WPBR management trials on currants and gooseberries across a range of susceptibility to WPBR. Early work focused on conventional pesticide programs and timing while more recent work focused on the management potential of organic and biopesticide programs.

A bulleted results summary of our trials follows Highly rust susceptible currant varieties:

- Can be successfully managed using a 4-5 applications of DMI or QoI fungicides. Unfortunately, the 2ee for

Nova 40W (DMI) is still in effect, but the 2ee does not apply to the replacement product Rally 40WSP. Cabrio EG is the remaining registered material for WPBR in currants.

- Can be managed to low level of infection using a 4-5 application program biopesticides and organic fungicides including materials such as Serenade Max, ProPhyt 4L, and JMS Organic Stylet oil.

Rust resistant to less susceptible currant and gooseberry varieties:

- Can be rust free using a 4 application program of DMI or QoI fungicides (Nova 40W and Cabrio EG see above).
- Can be rust free using a 4-5 application program biopesticides and organic fungicides including materials such as Serenade Max, ProPhyt 4L, and JMS Organic Stylet oil.

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*(**Source**: New York Berry News, Vol. 8, No. 3, March 2009)*

GENERAL INFORMATION

2009 Small Fruit Weed Management Update

A. Richard Bonanno, UMass

The update contains label changes for herbicides in small fruits to supplement what has already been published in the New England Small Fruit Pest Management Guide. In all cases, please obtain a copy of the complete label to obtain additional information on rates, timings, weed species controlled, and precautions to improve both crop and applicator safety.

A brief summary of each of the herbicides that is mentioned below:

Chateau (flumioxazin) provides premergence and limited postemergence control of many broadleaf species. It is similar in activity to other residual broadleaf herbicides in small fruits such as Sinbar (terbacil), Princep (simazine), Karmex (diuron), Casoron (dichlobenil), and Velpar (hexazinone). It will not control grasses so a residual grass herbicide is still recommended.

Prowl H2O (pendimethlin) is a residual herbicide that controls many grass species and also has activity on a limited number of broadleaf species. It has similar activity to Dacthal (DCPA), Devrinol (napropamide), Surflan (oryzalin), and Solicam (norflurazon).

Rage (carfentrazone) provides postemergence burndown control of many weed species. It does not provide any residual activity. As a burndown, it is similar in activity to Gramoxone (paraquat) and Scythe (pelargonic acid).

Callisto (mesotrione) provides premergence and postemergence activity of many broadleaf species. The spectrum of weeds controlled is not as good as with some other residual broadleaf herbicides but its postemergence activity is excellent. There is limited control both preemergence and postemergence of some annual grasses. Use of a residual grass herbicide is still recommended.

Strawberries

Chateau (flumioxazin) is registered in strawberries. In DORMANT strawberries, the rate is 3 oz/acre. Chateau will provide preemergence control of many broadleaf weed species. If small boadleaf weeds are emerged, also apply a crop oil concentrate at 1% or a non-ionic surfactant at ¼% by volume. Chateau will control emerged chickweed, field pansy, and oxalis if sufficient contact is made with the weeds. 2,4-D may still be required to control other emerged weeds. A residual grass herbicide such as Devrinol (napropamide) or Dacthal (DCPA) is still needed. Chateau can also be applied with a hood or shield to row middles of non-dormant strawberries prior to fruit set. This includes strawberries grown on both matted row and plasticulture systems. DO NOT allow Chateau to come into contact with the strawberry fruit or foliage.

Prowl H2O (pendimethalin) is registered in strawberries. Uniformly apply Prowl at a rate of 1.5 to 3 pints per acre to the soil surface PRE TRANSPLANT. Once the strawberries are established, an application may be made up to 35 days prior to harvest BETWEEN crops rows. DO NOT spray over strawberry plants. Application may cause stunting of daughter plants. Prowl provides excellent control of many annual grasses and several broadleaf species. See the label for a complete list of weeds.

Grapes

Chateau (flumioxazin) is registered in grapes. In grapes it is registered for both preemergence and postemergence control of weeds. If grapes are between 2 and 3 years old, the rate is 6 oz/acre. If grapes are at least 3 years old, the rate is 12 oz/application and 24 oz/year. It can be applied in the Spring as an alternative to either Sinbar (terbacil) or Princep (simazine). For postemergence control, use a crop oil concentrate at 1% or a non-ionic surfactant at ¼% by volume. A residual grass herbicide is still needed.

Rage (carfentrazone) is registered in grape. Apply at a rate of 12 to 40 ounces/acre to control emerged grass and broadleaf weeds. A non-ionic surfactant or crop oil concentrate should be used to improve the activity of Rage. See the label for rate suggestions. Rage will not provide residual control of weeds. All applications in grapes must be made with a hooded sprayer to avoid crop contact. Sufficient water must be used to provide complete coverage of weed foliage to obtain control. Contact with green bark, foliage, or fruit will cause crop injury and spotting. Rage can also be used at a rate of 3 to 4 oz/acre to suppress the vegetation growing in the row middles. This application must also be made with a hooded sprayer. Do not apply more than 40 oz/acre per application. Do not apply more than 242 oz/acre per season. Do not apply within 14 days of harvest. See the label for tank mix suggestions with other herbicides that will provide residual weed control.

Blueberry

Chateau (flumioxazin) is registered in highbush bluebery. In blueberry, it is registered for both preemergence and postemergence control of weeds. For preemergence control, apply to weed free soil at a rate of 6 to 12 oz/acre. Moisture is necessary after application to activate the herbicide. If emerged weeds are present, the residual activity of Chateau will be reduced since weed foliage will intercept some of the herbicide. A residual grass herbicide is still needed. For postemergence control of certain weed species, apply Chateau at 6 to 12 ounces per broadcast acre. For postemergence control, use a crop oil concentrate at 1% by volume or a non-ionic surfactant at ¼% by volume. For broader control of emerged weeds, check the label for tank mix applications with glyphosate or paraquat.

Rage (carfentrazone) is registered in highbush and lowbush blueberry. The label also covers currant, elderberry, gooseberry, and huckleberry. Apply at a rate of 20 to 40 ounces/acre to control emerged grass and broadleaf weeds. A non-ionic surfactant or crop oil concentrate should be used to improve the activity of Rage. See the label for rate suggestions. Rage will not provide residual control of weeds. A dormant application can be made using a directed spray to the base of the crop. Once the crop breaks dormancy, all applications must be made with a hooded sprayer to avoid crop contact. Sufficient water must be used to provide complete coverage of weed foliage to obtain control. Contact with green bark, foliage, or fruit will cause crop injury and spotting. Rage can also be used at a rate of 3 to 4 oz/acre to suppress the vegetation growing in the row middles. This application must also be made with a hooded sprayer. Do not apply more than 40 oz/acre per application. Do not apply more than 80 oz/acre per season using a hooded sprayer. The total of all applications per acre per season must not exceed 120 oz/acre. Do not apply within 14 days of harvest. See the label for tank mix suggestions with other herbicides that will provide residual weed control.

Callisto (mesotrione) is registered for use in highbush and lowbush blueberry. The label also covers lingonberry. In highbush blueberry and lingonberry, apply as a directed spray to the base of the plants prior to bloom. In lowbush blueberry, applications can only be made during the dormant year. Apply at a rate of either 3 or 6 oz/ acre. If 3 oz is used, a second application can be made no closer than 14 days apart. Use of a crop oil concentrate at 1% by volume with improve postmergence activity. Callisto will provide preemergence and postemergence control of many broadleaf weed species. See the label for a complete list.

Caneberry

Rage (carfentrazone) is registered in caneberries. The label covers but is not limited to blackberry, boysenberry, black raspberry, and red raspberry. Apply at a rate of 10 to 32 ounces/acre to control emerged grass and broadleaf weeds. A non-ionic surfactant or crop oil concentrate should be used to improve the activity of Rage. See the label for rate suggestions. Rage will not provide residual control of weeds. Applications can be made either as a directed spray to the base of the crop or with a hooded sprayer to avoid crop contact. In all cases, sufficient water must be used to provide complete coverage of weed foliage to obtain control. Contact with canes, foliage, or fruit will cause crop injury and spotting. Rage can also be used at a rate of 3 to 4 oz/acre to suppress the vegetation growing in the row middles. This application must also be made with a hooded sprayer. Do not apply more than 40 oz/acre per application. The total of all applications per acre per season must not exceed 272 oz/acre. Do not apply within 14 days of harvest. See the label for tank mix suggestions with other herbicides that will provide residual weed control.

UPCOMING MEETINGS:

March 25, 2009: *Regional Berry Pruning Work shop* Jefferson County CCE. More information: Sue Gwise, Jefferson County CCE, 315- 788-8450 or sjg42@cornell.edu.

March 26, 2009: *Regional Berry Pruning Work shop* Livingston County CCE. .More information: David Thorp, Livingston County CCE, 585-658-3250 ext 109 or dlt8@cornell.edu.

March 28, 2009. *Fruit Pruning Demo for Home Orchards.* Scott Residence, 45 Gilman Drive, Gilford NH. 9:00-10:30am. Covers peach, plum, pear, raspberry, blackberry, blueberry and hardy kiwi. For info, contact Amy Ouellette at amy.oullette@unh.edu or 603-527-5475.

March 30, 2009. *Fruit Pruning Demo & Pest Management Twilight Meeting.* Miller Farm, 51 Miller Road, New Durham NH. 4:30-7:30pm. Covers apples, peaches, nectarines, plums, blueberries and strawberries. For info, contact Geoffrey Njue at geoffrey.njue@unh.edu or 603-749-4445.

March 31, 2009. *Maine Vegetable & Fruit School,* BANGOR MOTOR INN, 701 Hogan Road, Bangor, Maine, 207-947-0355 or 1-800-244-0355, Directions: www.bangormotorinn.com $30 registration, 3 pesticide credits. For more info go to http://www.uvm.edu/vtvegandberry/meetings/Maine%20Fruit&Veg%20School09.pdf

April 1, 2009. *Maine Vegetable & Fruit School,* KEELEY'S BANQUET CENTER, 178 Warren Avenue, Portland, Maine, 207-797-3550 or 1-800-439-3550, Directions: www.keeleythekaterer.com, $30 registration, 3 pesticide credits. For more info go to www.uvm.edu/vtvegandberry/meetings/Maine%20Fruit&Veg%20School09.pdf

April 3, 2009. *Grape Pruning Demo.* Brookdale Fruit Farm Packinghouse, Hollis NH. 5:30-7:00pm. For info, contact George Hamilton at george.hamilton@unh.edu or 603-641-6060.

April 4, 2009. *Blueberry Pruning Demo.* Kevin Pike's Brookfield Blues, Brookfield NH. 10:00am-noon. For info, contact Tina Savage at tina.savage@unh.edu or 603-447-3834.

April 4, 2009. *Grape Pruning Clinic***.** Jewell Towne Vineyards, South Hampton NH. 9:30am-noon. Space is limited. For info and to register, contact Nada Haddad at nada.haddad@unh.edu or 603-679-5616.

April 4, 2009. *Apple, Peach, Blueberry and Grape Pruning Demo*. John Lastowka Residence, 183 Amherst Rd, Merrimack NH. 9:00am-1:00pm. Apple and peach in the morning, Blueberry and grape in the afternoon. For info, contact George Hamilton at george.hamilton@unh.edu or 603-641-6060.

April 6, 2009: *Regional Berry Pruning Work shop* Delaware County CCE. More information: Janet Aldrich, Delaware County CCE, 607- 865-6531, or jla14@cornell.edu.

April 20, 2009: *Small Fruit IPM Scout Training – Session III*. Green Acres Farm, Rochester, NY.

April 21-23, 2009: *UMass Fruit Team 1st Round Spring Twilight Meetings.* Locations to be announced. For more information, go to www.umass.edu/fruitadvisor .

May 12, 2009: *Small Fruit IPM Scout Training – Session IV*. Green Acres Farm, Rochester, NY.