The New York Berry News

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What's Inside

May through July are the most important months for disease, insect, and weed management. It has been quite wet over the last week or more creating good conditions for many diseases, and making it difficult to get in to fields to stay ahead of weed pressure. Several of the early season diseases, such as mummyberry and gray mold, were covered in last months edition of the NYBN. In this month's edition we cover a few more important diseases, several insect pests and weed management for brambles and strawberries.

Pesticide News:

Since the last newsletter, two section 18s for blueberry and a supplemental label for Switch 62.5WG were approved by EPA and NY DEC:

INDAR 75WSP: The EPA has granted a section 18 for the use of fenbuconazole, formulated as Indar 75 WSP, on blueberry in New York for use against mummyberry. A maximum of five (5) applications may be made at 10-14 day intervals, at a rate of 2 oz. of product per acre. No more than 10 oz. of product per acre may be applied per year. A worker re-entry interval (REI) of 12 hours and a pre-harvest interval (PHI) of 30 days must be observed. Indar may not be applied through any type of irrigation system. The section 18 expires June 30, 2003.

TOPISN-M WSB: The EPA has once again granted a section 18 for the use of Thiophanate Methyl, formulated as Topsin-M WSB, on blueberry in New York for use against mummyberry, gray mold, anthracnose, fusicoccum canker, and phomopsis twig blight and canker. A maximum of three (3) applications may be made at 7-10 day or longer intervals, at a rate of 1 lb. of product per acre. No more than 3 lb. product per acre may be applied per year. A worker re-entry interval (REI) of 12 hours and a pre-harvest interval (PHI) of 7 days must be observed. Product may not be applied through any type of irrigation system. The section 18 expires September 30, 2003.

SWITCH 62.5WG: The EPA has approved a supplemental label for Switch 62.5WG for control of mummyberry, anthracnose, alternaria, and phomopsis on bushberry (i.e., blueberry, currant, gooseberry, elderberry, and huckleberry) and gray mold on both bushberry and caneberry (i.e., raspberry and blackberry). Switch can be apploed at a rate of 11-14 oz/A and applied at a 7-10 day interval; maximum 56 oz of product per year; no more than 2 consecutive sprays can be made.

Growers can access labels to all these products by visiting: http://www.nysaes.cornell.edu/pp/extension/tfabp/pestnews.shtml.

Current News and Events:

N.Y. Farmers Hope to Grow Black Currant

The black currant, long known as the "forbidden fruit" for its role in spreading a fungus that kills white pine trees, may soon be welcome again in New York. Farmers in more than a half-dozen states are prohibited from growing the round, dark purple berry.

But New York lawmakers have sent Gov. George Pataki a bill that would reverse a century-old state ban on growing most black currants, and many farmers hope they'll soon have another crop to plant.

"This is the first viable crop to come along in a long time that can offer farmers a real alternative," said Greg Quinn, a farmer and fan of black currants. "This is going to be a real boon for New York farmers." At a time when farmers are struggling, Quinn believes New York farms stand to profit by creating a niche and marketing the berry as the state's own once the ban is lifted. "Idaho potatoes, Iowa pork, Florida oranges and Washington state apples have become familiar, marketable agricultural entities. Why not New York currants?" said Quinn, who grows disease-resistant black currants on his 135-acre farm in the Hudson Valley.

Under the bill, New York farmers could grow all species of black currants in designated districts. Currently, farmers can only grow disease-resistant currants, but many opt out of growing them altogether. Black currants are commonly found in tea, yogurt, jams and vodka. In the late 1800s, New York led the nation in black currant production, but the state banned the fruit after scientists said it may help spread the blister rust fungus that destroys white pine trees. Recent studies found the presence of black currant bushes does not necessarily lead to the spread of blister rust and that damage to white pine trees from the disease is not as extensive as once thought. Nevertheless, New York, Maine, New Hampshire, New Jersey, North Carolina, South Carolina and Virginia continue to ban black currant production.

In Europe, where blister rust is under control, black currant is a billion-dollar industry. Black currant advocates predict the berry could be a $20 million crop in New York and a $1 billion business nationwide. "This is a very real potential for the growth of the growing of currants and the ability of farmers to make some money off this," said Assemblyman William Magee, a Madison County Democrat. Besides their potential to make money for farmers, black currants contain important vitamins and minerals and have higher antioxidant properties than other dark berries like blueberries, Quinn said. Antioxidants are believed to help prevent degenerative diseases such as cancer and heart disease.

To bring back the currant crop to New York farmland, Quinn founded Au Currant Enterprises, a Clinton, N.Y.-based management company designed to help landowners in choosing and harvesting disease-resistant varieties of currants. "What we're looking to do is put currants and New York on the map again," he said. *(Copyright 2003 Associated Press Online)*

Worldwide Blueberry Acreage Increased in the Last Decade

Jim Hancock & Eric Hanson, Michigan State University, East Lansing, MI

More than 225 million pounds of blueberries are now produced annually in the world with more than 50% sold fresh. About 80% of the total production comes from North America, 10% from Europe, 5% from South America and 4% from the Pacific Rim. In North America, Michigan was the leading producer of blueberries at 65 million pounds, followed by New Jersey at 36 million pounds, British Columbia at 31 million pounds, Oregon at 21 million pounds, North Carolina at 12.5 million pounds and Washington State at 10 million pounds. About 13% of the fruit was produced in the southern U.S. and 87% in the northern U.S. Michigan's annual production has averaged 66 million pounds over the last five years. Worldwide blueberry acreage has risen by about 60% over the last decade, from 42,500 to 68,500 acres. The most substantial increases have occurred in North America (40,000 to 57,500 acres), Chile (30 to 2,500 acres), Germany (650 to 2,500 acres), Poland (350 to 1,000 acres) and Australia (225 to 925 acres). Chile is expected to double its acreage over the next five years and a significant industry is emerging in Argentina.

Of all the major production regions, only New Zealand has lost acreage (1,000 to 750 acres). In North America, the largest acreage in 1999 was in the Midwest (21,000 acres), Northeast (13,500 acres), South (12,500 acres) and the Northwest (10,400 acres). California is at about 500 acres, with much greater expansion expected. Michigan's acreage over the last decade has increased from 16,400 to 18,000 acres. The most important varieties worldwide include Bluecrop, Jersey, Weymouth, Croatan, Blueray, Elliott, Rubel and Duke. Brigetta is very important in Australia, and O'Neal in Chile, Duke has been the most actively planted variety in the last five years. In Michigan, 39% of our acreage is Jersey, 27% Bluecrop, 10% Elliott and 9% Rubel. All other varieties are less than 2.7%. *(Source: The Fruit Growers News, April 2003).*

Global Berry Farms and Atlantic Blueberry Join Sales Effort

Global Berry Farms (GBF) and Atlantic Blueberry Co. Inc. have announced a strategic sales alliance which will not only augment GBF's year round supply, but will also continue to serve Atlantics' customers. GBF will provide marketing and sales for the majority of Atlantic's production, while Art Galletta, president of Atlantic Blueberry,

will continue to manage sales for existing accounts. In a joint statement, Galletta and John Shelford, president of Global Berry Farms said of the alliance, "This is an opportunity to better serve our customers, and to provide growth for both Atlantic Blueberry Company, and Global Berry Farms."

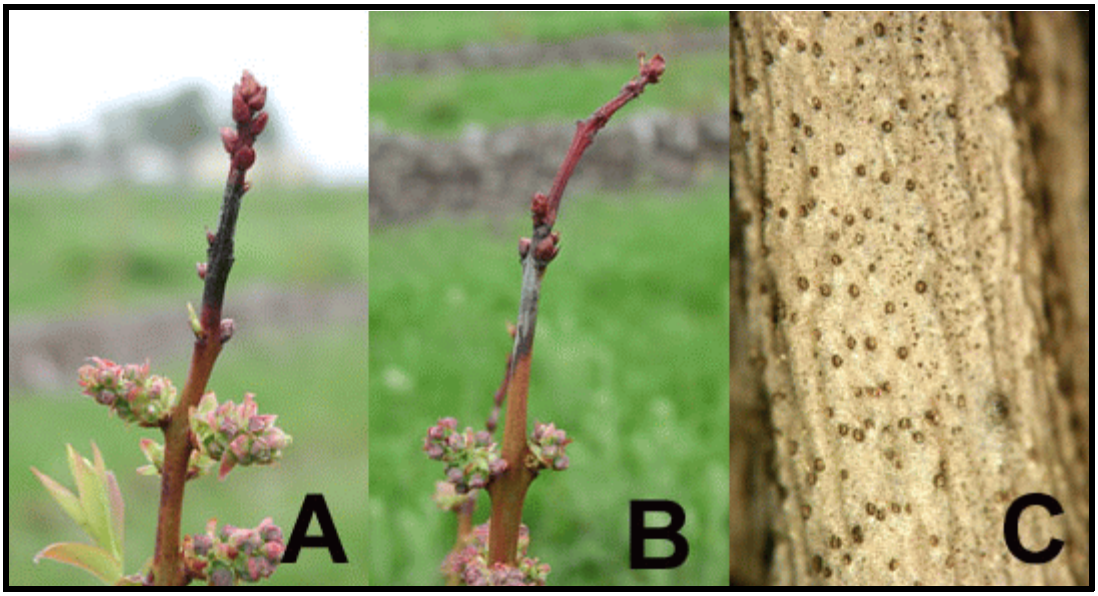
"Global Berry Farms' mission is to be the premier year round berry category supplier, and this alliance is "win-win" for both companies," said Shelford. He said GBF supplies blueberries every week of the year excepting June 15 to July 10. "Atlantic fills this period perfectly, and enables GBF to meet customer's blueberry requirements during this important volume and value time. "Atlantic's peak blueberry production period is June 15 to July 25. "Atlantic Blueberry is growing. As the industry and customer structure changes, we believe this alliance provides the best marketing and sales for our family's future," said Galletta. Atlantic has been growing blueberries since 1935, currently with more than 1,300 acres in southern New Jersey.

GBF is headquartered in Naples Fla. with sales offices in Tampa, Dallas, Grand Junction, Mich. and Watsonville, Calif. growing strawberries, blueberries, raspberries and blackberries in every significant growing district in the Western hemisphere. Atlantic Blueberry Company, Inc. is headquartered in Hammonton, N.J. and is widely recognized as one of the blueberry industry's premier producers. *(Source: The Fruit Growers News, May 2003)*

Blueberry Freeze Injury or Phomopsis?

Annemiek Schilder, Michigan State University, East Lansing, MI

This spring, tip dieback is prevalent in some blueberry fields. In some cases, the damage seems to be due to freeze injury, while in other cases the *Phomopsis* fungus may be to blame. While the two symptoms are often difficult to tell apart, there are a few differences that may help you diagnose the problem. If the dieback is due to *Phomopsis*, the infection would have taken place the previous year or the year before that if it wasn't pruned out. The infected twig or cane tends to be dark reddish brown with a gray-bleached area at the tip or farther down the twig or cane (Fig B). Often, the border between the dead and live portions of the cane is fairly distinct. The bleached area may range from one to several inches long and may contain tiny black pimples, which are the fruiting bodies of the fungus (Fig C). The fungus is most likely to sporulate in the bleached area.



More recent twig infections may appear dark brown to almost black (Fig A). The lesions may be enlarging down the twig from the tip or up and down the twig from an infected lateral bud, which will die before or during bud break. Also, if you notice that the lesions keep expanding, it is most likely Phomopsis twig blight and not freeze injury. The fungus can infect twigs and canes anywhere on the bush. Young green canes lower in the canopy often display reddish brown lesions (cankers) that may be flattened. Freeze injury tends to turn cane tips a light reddish brown, without a bleached area, and the border between dead and healthy tissue is more gradual. Freeze injury may especially affect young green canes that did not harden off well last fall. Also, the damage may be widespread throughout the field and more severe in low-lying areas that are prone to frost. Phomopsis twig blight incidence can be reduced by pruning out and destroying infected canes and twigs, which act as inoculum sources. Fungicide options for controlling Phomopsis twig blight are Topsin M (tankmixed with Ziram or Captan), Bravo, Indar, and Cabrio. The Section 18 label request for Topsin M WSB has been approved for NY (see above). *(Source: Michigan Fruit Crop Advisory Vol. 18, No. 4, May 6, 2003)*

Managing Blueberry Anthracnose Begins Now

Peter Oudemans, Rutgers University, Chatsworth, NJ *[edited by Bill Turechek].*

Anthracnose is an important disease to control now. The symptoms appear just prior to or following harvest as softened fruit followed by orange colored spores covering part of the fruit surface. Although the fungus can infect fruit throughout the season and the symptoms do not develop until the fruit ripen, we believe the majority of initial infections begin during bloom. A significant impact on control can be made by starting applications during early bloom. Anthracnose control should begin now.

Anthracnose Facts

Fungus name: *Colletotrichum acutatum.*
How does it spread? Water borne spores formed on dead branches or buds during the early part of the season and later on infected fruit.
Infection period: 12 hours of leaf wetness at 59-80 C.
What does it infect? Leaf and immature berries.
Cultural control: Pruning to remove initial inoculum and improve canopy aeration.
Labeled fungicides: Abound, Aliette, Bravo, Cabrio, Captan, Switch, Ziram

For 2003, a number of fungicides are registered for anthracnose (see below). Bravo can be very effective, but it has a 42-day pre-harvest-interval and it may have phytotoxicity problems on blossoms. Bravo is persistent and should provide protection for 2-3 weeks. Captan and Ziram are less persistent and therefore need to be applied more frequently. Captan has a 4-day re-entry period and Ziram has a 14-day pre-harvest interval. Ziram does show a longer persistence than Captan and the interval for Captan should be 7-10 days whereas Ziram can be extended to 10 -14 days. Two newer compounds, Abound and Cabrio, are available for anthracnose control. These materials have excellent activity however, they should be used with care. Resistance management means you should not use these compounds in more than two sequential applications because the fungus will build up resistance. Also, Abound can be extremely phytotoxic to certain apple varieties. Therefore, Abound should not be sprayed anywhere near an apple orchard, and spray tanks which have had Abound in it should not be used to apply pesticides to apples as the residue in these tanks is enough to cause sever phytotoxicity. Switch is also labeled for anthracnose however we have not conducted sufficient tests to determine efficacy against this disease. All of these fungicides are protectant only, they have no kick-back activity. Therefore, they must be applied before infection takes place. A fourth compound, Aliette, has a very different mode of action. In our tests, Aliette had very little protectant activity but showed significant curative ability. For use in commercial production this material would be most effective if used prior to second and third picking as it should provide improved keeping quality for the fresh market. Aliette has a 12 hr re-entry and a 0-day pre-harvest-interval.

Table 1. Fungicides labeled for blueberry disease management in New York (modified by Turechek for NY from original article).

Fungicide	Activity*	Max. # of apps	Rate/acre	Interval	REI	PHI
Abound	Ant, Alt, MB	3	6.2-15.4 oz	7-14 days	4 hr	0 days
Aliette WDG	Ant, Phy	4	5.0 lb	14-21 days	12 hr	0 days
Bravo Ultrex	MB, Ant	3	2.7-3.6 lb	7-10 days	12 hr	42 days
Bravo Weather Stik	MB, Ant	3	3-4 pts	7-10 days	12 hr	42 days
Cabrio EG	Ant	4	14 oz	7-14 days	24 hr	0 days
Captan 80WP / 50WP	Ant, Ph	14	3.1 / 5 lb	7-10 days	4 days	0 days
Elevate 50WDG	Bot	4	1.5 lb	7-10 days	12 hr	0 day
Indar 75 WSP*	MB	5	2 oz	7-10 days	12 hr	30 days
Lime Sulfur	Ph	1	5-6 gal	Do not apply within 14 days of oil		
Rovral	Bot, MB	4	1-2 lb	14 days	24 hr	0 days
Switch 62.5WG	Bot, MB, Ph	4	11-14 oz	7-10 days	12 hr	0 days
Topsin-M WSB*	Bot, Ph	3	1 lb	7-10 days	12 hr	7 days
Ziram 76DF	Ant, Alt, MB	5	3 – 4 lb	7-10 days	48 hr	3 wk post

* Ant=Anthracnose; Alt=Alternaria fruit rot; Bot=Botrytis or gray mold; MB=Mummyberry; Ph=Phomopsis; Phy=Phytophthora
** see section 18 label

Strawberry Fields Forever!

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

So what's the big deal about a few leaf spots here and there, anyway?! Why do we need to be concerned about controlling the fungi that cause them? Let's think a moment about the whole purpose of leaves. Leaves are the energy powerhouses for the plant, producing the food needed to keep them strong and healthy, and fruiting prolifically. They also build the stored reserves needed in perennial plants to sustain them through our northern winters. Any reduction in their power producing capabilities then, potentially results in reduced fruit load or winter hardiness. Foliar infections, which build up over time in our perennial strawberry plantings, may contribute significantly to the productivity and longevity of the planting. Scouting and preventative maintenance in terms of strawberry foliar diseases could be a wise bet in protecting your investment.

Leaf Blight is caused by the fungus *Phomopsis obscurans*. The major damage caused by this fungus in perennial planting systems is destruction of older foliage in late summer resulting in reduced plant vigor and yields the following season. Leaf blight is particularly destructive to slow-growing or weak plants. It seldom damages young, runner plants, and rarely attacks the fruit in the Northeast. *P. obscurans* is spread by splashing caused by frequent rains and overhead irrigation. Little spread occurs during hot, dry weather in the summer, although symptoms may continue to develop during this period.

Leaf Scorch is caused by the fungus *Diplocarpon earlianum*. It is a problem on numerous cultivars in North America and can markedly reduce vegetative growth and fruit yield. Losses range from negligible to severe, depending upon cultivar susceptibility, planting system, and weather conditions. Scorch can severely weaken plants, resulting in sharp growth declines for shoots and roots, and reduced numbers and vigor of crowns. Severely infected plants may die from environmental stresses, such as heat, cold or drought.

Leaf spot, caused by the fungus *Mycosphaerella fragariae*, is one of the most common and widespread diseases of strawberry. It is also the cause of black seed; a disease of the fruit that can occur when warm and wet conditions exist during bloom. Prior to the development of resistant cultivars this disease was the most economically important strawberry disease in the Northeast. However, many commercially grown cultivars are not resistant to leaf spot so this disease is still of great importance on susceptible cultivars such as 'Honeoye', 'Raritan', and 'Kent'.

These three diseases develop rapidly during rainy periods, when heavy dews occur, or when overhead irrigation is used. If the planting has a history of any of these diseases, or conditions are favorable for the development of disease, an application of Captan 50WP (3-6 lb/A) or Nova 40W (2.5-5 oz/A) will be helpful; particularly if applied prior to a rainy period. Nova 40W is labeled for control of leaf spot and leaf blight and is very effective. However, Nova has no activity against gray mold; you may choose to use Nova after bloom. Quadris 2.08F is very effective against leaf blight; this option should be reserved for later in the season in plantings where anthracnose is a concern. Cabrio EG should be just as effective, however I have had no experience with this product. If repeated applications are necessary, it is recommended that you alternate among the different fungicidal choices for resistance management. Applications should begin when disease appears and continue on a 14 to 21 day schedule or when conditions favor disease development. Cultural methods for disease management include keeping fields well weeded to improve air circulation and reduce drying time for leaves. Older or infected leaves should be removed before setting runners in new plantings. Removing and burning all debris at renovation helps to reduce overwintering inoculum of leaf pathogens.

Orange Rust of Blackberries and Raspberries

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

We should expect to be seeing symptoms of orange rust on infected black and purple raspberries and blackberries soon. Orange rust occurs only on black and purple raspberries and blackberries and not on red raspberries. New canes from infected plants tend to be weak, spindly, thornless, and usually have misshapen, pale leaves. In contrast to new canes, they usually come up in bunches rather than singly. The lower surfaces of new leaves and for several weeks afterwards are covered with orange spores. It is important to scout your plantings and ***dig up and remove*** any infected plants before they release spores and spread the disease. Once a plant is infected with disease, it is infected for its life. Growers that wish to use chemical control for orange rust should begin sprays just before the orange spores are released from infected plants. These sprays should focus on protecting uninfected plants in plantings with infected plants. The fungicides Nova 40W at 2.5 oz/A and Cabrio EG at 14 oz/A are the fungicides currently registered for control of orange rust. They should be applied on a 10 to 14 day schedule until leaves on infected plants dry up and stop producing the orange spores. This is usually around mid-July.

Spring Arthropod Pest Management for Berry Crops in New York

Greg English-Loeb, Dept. of Entomology, Cornell University, Geneva, NY

Management of arthropod pests begins in earnest as the temperatures increase and the growing season gets under way. Before reviewing the list of potential arthropod pests for each of the major berry crops, I want to comment on a few changes in chemical control options for berry growers. Actually, not much has changed since last year. As a reminder, Confirm 2F (Dow), an insect growth regulator with specificity against many lepidopteran pests, received NY DEC approval last year for use on blueberries with the principal target pest being the cranberry fruitworm. Another Dow product, Spintor 2SC, has also received DEC approval for use in blueberries. I have not had much experience with either of these materials although based on information out of New Jersery (courtesy of Dr. Sridhar Polavarapu), Confirm is probably the better choice for cranberry fruitworm because of its longer residual activity. In other news, a new miticide from Uniroyal (Acramite) has received both federal EPA and state DEC registration for use in a number of fruit crops including strawberries.

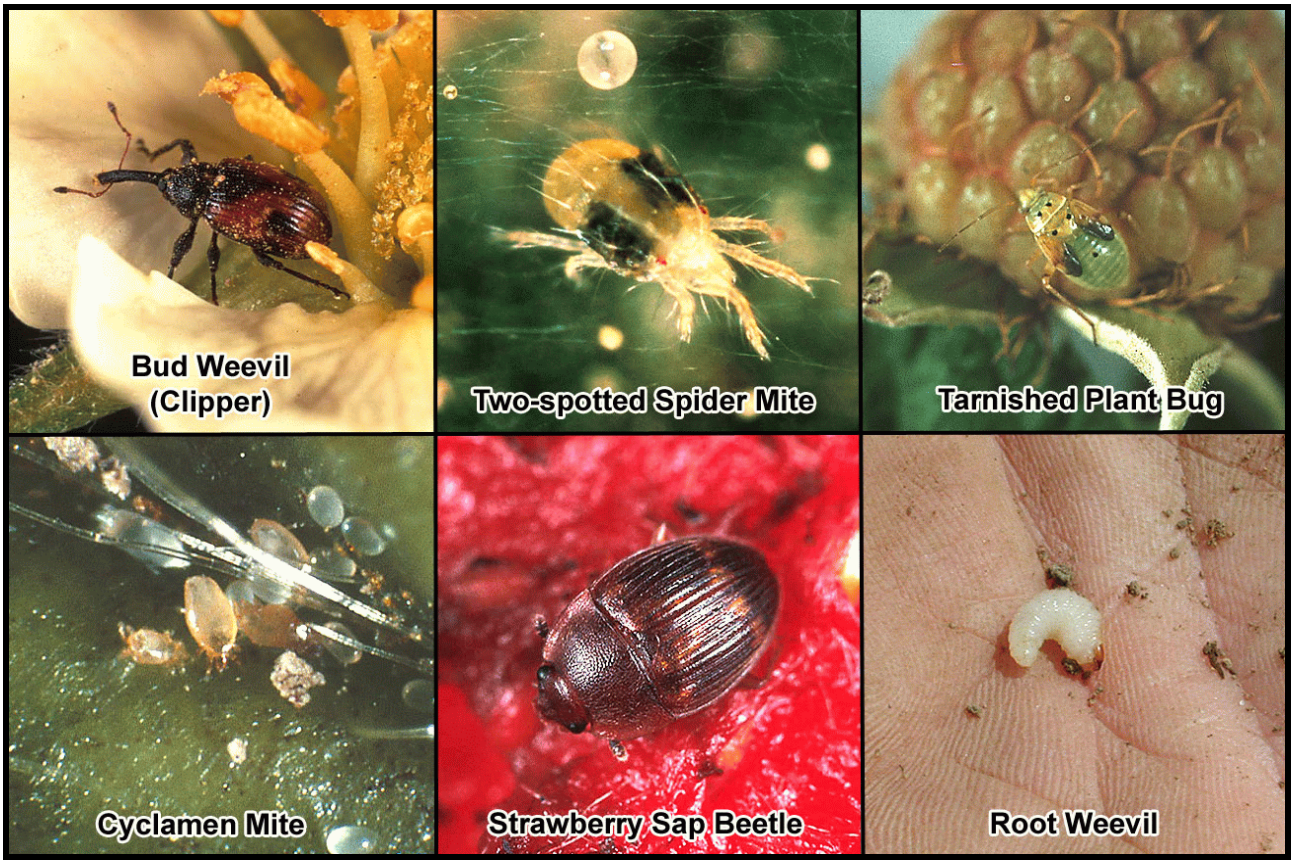
The Food Quality Protection Act, passed in 1996, required the EPA to review the label status of a number of older generation pesticides. Organophosphate insecticides were one of the first groups reviewed followed by carbamate pesticides. This review is still in progress. Last year I reported that azinphosmethyl [Guthion] was slated to be cancelled on certain crops such as strawberries and grapes. However, as of now, this has not occurred and Guthion is still available. Note that phosmet [Imidan] and carbaryl [Sevin] are currently under review, with particular focus on extending the re-entry interval. We will keep you posted on the outcome of these various activities.

Strawberries

During the prebloom period the strawberry **bud weevil** (**clipper**) is the main arthropod pest to watch out for. In recent years we have learned that many strawberry cultivars, such as Jewel and Seneca, can tolerate a fair amount of bud loss from this pest, although at sufficient densities, it can still be a problem. As a rough rule of thumb, treat for clipper when you observe more than one clipped primary or secondary flower bud or more than 2 tertiary buds per truss, on more than one truss per foot of row. Note that once flowers are open they are no longer at risk from clipper. Clipper often is a more severe problem along borders of plantings, near woods. Lorsban [chlorpyrifos] and Brigade [bifenthrin] are labeled for clipper in New York.

Also during the prebloom period (and extending through harvest and sometimes after renovation) **two-spotted spider mite** can be a problem in some plantings. Look for whitish or yellowish stippling on leaves. Current threshold is 5 mites per leaf or about 25% of leaflets have at least 1 mite. This is likely a conservative threshold for a healthy planting and research currently being conducted should provide a better estimate. There are several compounds labeled for mites on strawberries in New York: Kelthane [dicofol], Vendex [hexakis], Agri-mek [abamectin], Savey [hexthiazox], Acramite, Danitol [fenpropathrin] and Brigade. Kelthane, Danitol and Brigade are hard on predatory mites. Agri-mek label calls for 2 applications, 2 weeks apart. For all these materials, coverage is very important. The mites mostly stay on the underside of leaves.

Tarnished plant bug (TPB) is the key insect pest of strawberries during bloom to near harvest. Both adult bugs and the nymphs cause injury (deformed fruit) but nymphs are probably of the greatest concern for June-bearing cultivars. The economic threshold is half a nymph per flower cluster (you sample by tapping cluster over a white plate and counting nymphs that fall off). It is worth sampling for this pest on a regular basis since it varies in population size from

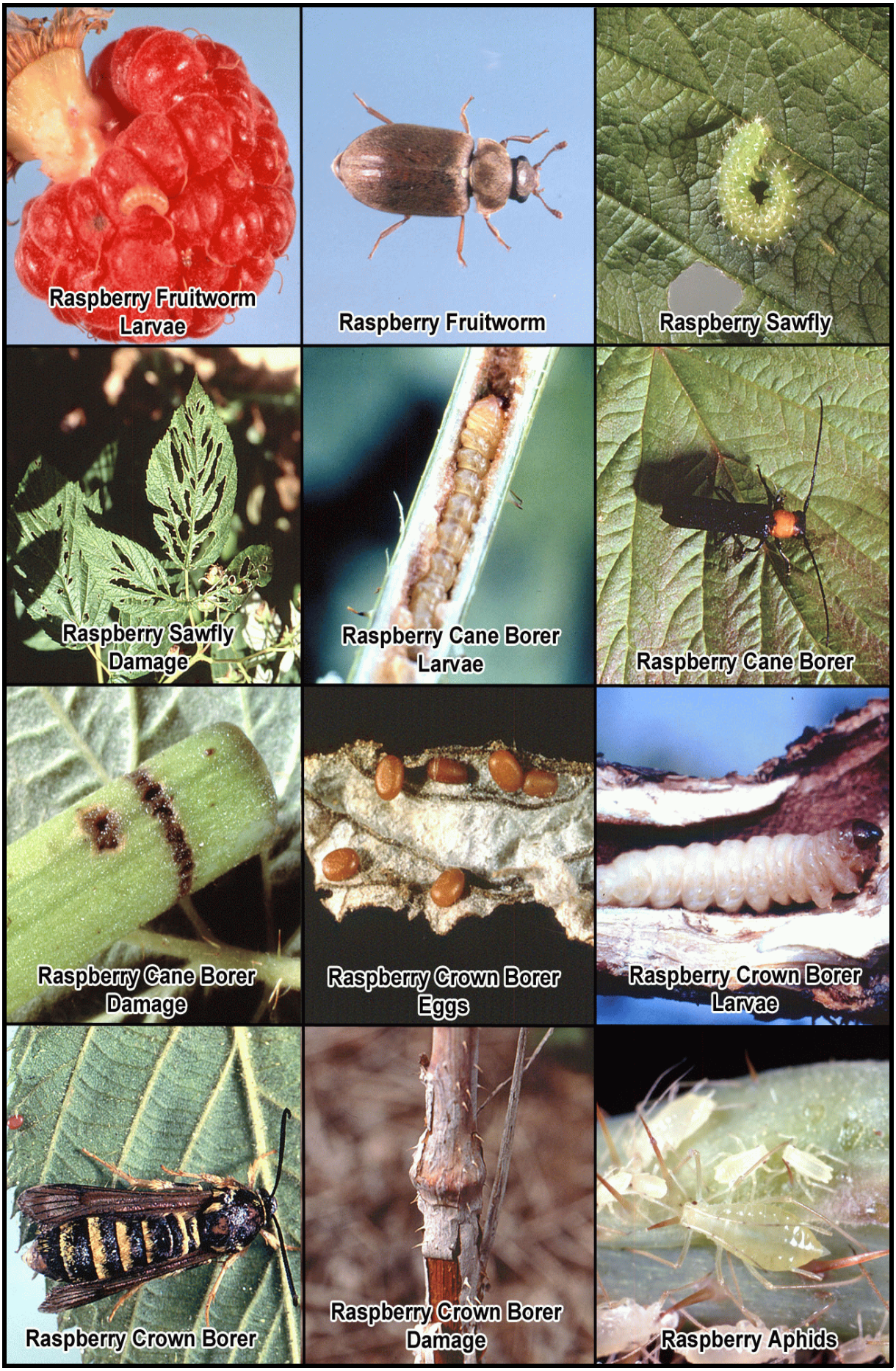


place to place and from one year to the next. Spraying a pesticide when nymph counts are below threshold costs you money and can kill beneficial arthropods unnecessarily. Good weed management can help reduce problems with TPB.

Cyclamen mite is a potentially serious pest that seemed to show up in more fields than usual two years ago but was not very prevalent in 2002. The mites get active in the spring with populations peaking after bloom. The mites like to feed on young leaf tissue (just as the leaves are unfolding). The mites themselves are difficult to see without a good hand lens. Cyclamen-damaged leaves tend to be stunted and crinkled. Prior to bloom or after renovation are good times to treat for this pest. Kelthane and Thiodan [endosulfan] are labeled for use against cyclamen mites. Use lots of water for thorough coverage.

Two more insect pests deserve mention at this time. The first is **Strawberry sap beetle** (SSB) (see previous issue for more details on biology and management of SSB). This small, brownish beetle seems to be increasing as a pest in New York strawberries. Both the adult beetles and the larvae feed on ripe and overripe fruit. We still are exploring the best ways to control SSB. Two pyrethroids are labeled in New York for its control: Dantitol and Brigade. Note that Brigade does not have a preharvest interval while for Danitol it is 2 days. However, Brigade is more expensive. For both materials, good coverage is likely to be important for its control. **Spittlebug** starts appearing on leaves, stems, and flowering racemes about this time (bloom) and extending into harvest. They overwinter as eggs in the soil and hatch out as temperatures rise in the spring. The nymphs crawl up the plant and begin feeding on the xylem tissue (the water conducting vessels of the plant). There are not a lot of nutrients in xylem and therefore nymphs need to process a lot of sap, extracting the few nutrients out for their use and excreting the remaining water. This water is frothed into white spittle, which helps protect the nymphs from desiccation and natural enemies. You can often find several nymphs within a spittle mass. Feeding by spittlebugs, if extensive, can stunt plants and reduce berry size. Perhaps more importantly, the spittle masses are a nuisance to pickers. Threshold for spittle bug masses is 1 mass per foot row. Guthion and Thiodan are labeled for use against spittlebugs. Weedy fields tend to have more problems with spittlebugs.

Root weevil (there are several species) is the last strawberry pest I want to discuss in this issue. The larvae feed on roots and crowns and when abundant can cause serious damage to plantings. Beds with heavy infestations show distinct patches or spots that appear stunted and have reduced yields. Drought stress aggravates the injury from larval feeding. Chemical control (Danitol or Brigade) is targeted at the adults that emerge in mid to late June. Look for characteristic adult feeding damage on leaves (notching from the edge) to help determine timing. The adults feed for a few days before starting to lay eggs. Some growers have also had success controlling root weevil larvae using parasitic nematodes. These


Raspberry Fruitworm Larvae
Raspberry Fruitworm
Raspberry Sawfly
Raspberry Sawfly Damage
Raspberry Cane Borer Larvae
Raspberry Cane Borer
Raspberry Cane Borer Damage
Raspberry Crown Borer Eggs
Raspberry Crown Borer Larvae
Raspberry Crown Borer
Raspberry Crown Borer Damage
Raspberry Aphids

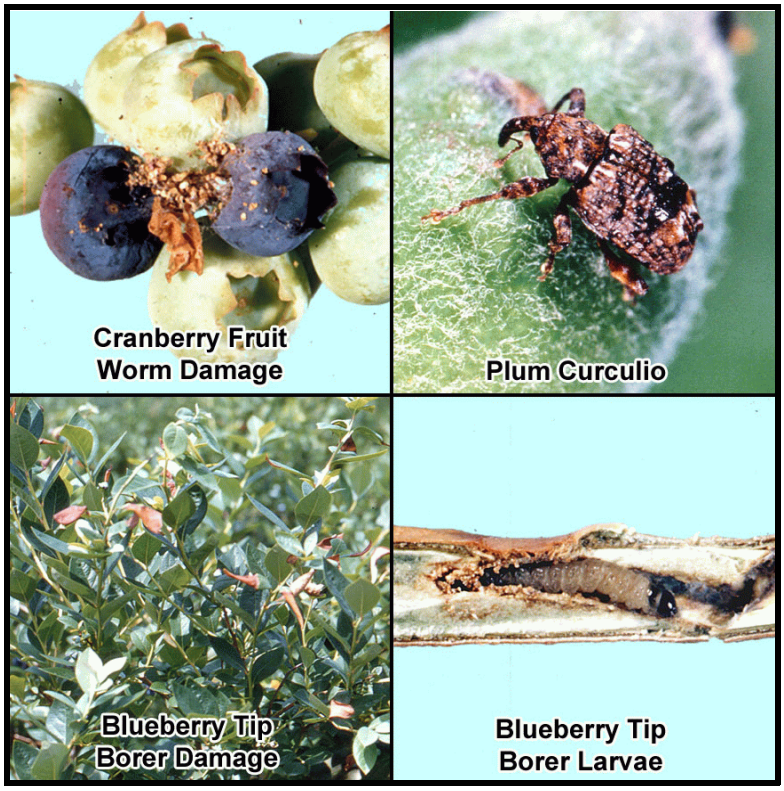
can be applied either in the spring (late April and early May) or in the fall. Use sufficient water to get good penetration. Rotation out of strawberries is the best remedy for root weevils. They are wingless and do not move a great distance. However, new plantings should be placed 50 meters or more from an infested planting.

Raspberries

There are a number of potential pests of raspberries to be concerned with during this time period (early prebloom to postbloom). Be on the alert for feeding damage from the adult **raspberry fruitworm** (a beetle, light brown in color) on foliage and fruit buds. The larvae of this beetle pest feed inside flower buds and young fruit. Adult feeding damage on foliage creates a skeletonized appearance somewhat similar to the feeding damage caused by larvae of **raspberry sawfly** (pale green caterpillar-like body with many long hairs). Both the fruitworm and the sawfly appear during the prebloom period. Carbarl [Sevin] is labeled for both of these pests and the timing is similar.

Tarnished plant bug (TPB) is another potential problem for raspberry growers during the period from bloom to harvest. Both the adults and their nymphs can cause deformed fruit, although the deformities are not as obvious in raspberries as in strawberries where TPB is also an important pest (see below). We do not have a good estimate of the economic threshold for TPB in raspberries but a rough guide would be 10 to 20% of canes infested with adults or nymphs. Carbaryl is labeled for control of TPB on raspberry. Its not the most effective material on plant bugs but pretty much all we have with plant bugs specifically on the label. Note that weedy fields aggravate TPB problems.

Raspberry cane borer and related beetle species make their appearance during this period. The adults emerge in the spring, mate and start laying eggs. Larvae bore into canes and during the season and for some species, the next season. They cause injury and death to canes and potentially entire crowns. The best time to kill adults is during the late prebloom period (for summer-bearing raspberries), although note that there is nothing specifically labeled for it now that methoxychlor [Marlate] is no longer available. As an alternative to insecticides, during the season remove wilted shoot tips below the girdled stem (two rows of puntures around an inch apart) where the egg of the raspberry cane borer has been placed. Also, during the dormant season remove and destroy canes with swellings. Another pest that can cause serious injury to canes and the crown is the **Raspberry crown borer**. The larvae of this moth feed at the base of the cane and into the crown over a two-year period. The first signs of a problem often appear during fruit maturation. The withering of and dying of canes, often with half matured fruit, can be a symptom of feeding damage at the base. Canes with these symptoms should be removed during the growing season and destroyed. The adult moth actually does not appear until later in the summer (early August). It is a very attractive moth that superficially resembles a yellow jacket. No insecticides are currently registered in New York for control of crown borer.



During the spring and into the summer you may find two species of aphids that attack raspberries, **large raspberry aphid** and **small raspberry aphid**. Feeding damage by aphids causes leaf curling and reduced growth of shoots. The more important injury comes from viruses transmitted by the aphids (raspberry mosaic virus by the big aphid and raspberry leaf curl virus by the small aphid). This can be a particular problem for nursery plants. Guthion is labeled for aphids on raspberries.

Finally, I should mention **two-spotted spider mite** (TSSM) as a potential pest. These tiny spider-like arthropods can become very numerous on foliage, causing white stippling on leaves. They seem to be most problematic in dry sites and/or in mild growing areas such as the Hudson Valley and Long Island. As of last year there is now a miticide registered in New York for control of TSSM (Savey WP). Predatory mites can also provide control of TSSM. These beneficial mites are frequently naturally present in raspberry fields, especially where few broad-spectrum insecticides are used, but can also be purchased from a supply house. For both Savey and predatory mites, it's important

to start control actions early before you see lots of severe injury to foliage (bronzing). Additional arthropod pests that might show up later in the season (bloom to harvest) include **Root weevil**, **Japanese beetle**, **picnic beetle**, and **potato leafhopper.**

Blueberries

Cranberry Fruitworm and **Cherry Fruitworm** are the main blueberry arthropod pests in the spring and early summer. These moths overwinter as fully-grown larvae. They pupate in the spring and begin flying in late May and early June (around the time of flowering). Egg laying begins at around petal fall with eggs being placed at the base of newly set fruit. A sex pheromone is available to monitor the flight activity of adult cranberry fruitworm (Great Lakes IPM, www.greatlakesipm.com, 989-268-5693). Two applications of an insecticide such as Confirm or Guthion, starting at petal fall and 10 days later, is required for sites with heavy pressure. Research in New Jersey indicates that in areas of moderate pressure, one application 5 to 7 days after petal fall provides as good control as two applications. Other pests to keep an eye out for are **plum curculio** (notice crescent-shapped scar created from egg-laying on young fruit), **leafrollers** (larvae make shelters by silking together terminal leaves), and **blueberry tip borer** (larvae bore into stem causing shoot tips to die back). Of course, later in the summer you need to be alert for **blueberry maggot flies**, **blueberry stem borer**, and **Japanese beetle** (more on these in next newsletter).

Currants and Gooseberries

Imported current worm (ICW), when present, can cause considerable injury to foliage. The adult, which becomes active in the spring, is wasp-like in appearance (indeed its in the wasp group, but part of a primitive line called sawflies that are herbivorous as larvae). Eggs are laid along the midrib or on the undersides of the leaves. Larvae of the first brood appear in spring, shortly after leaves are out. They initially feed in colonies but as they become larger, feed singly. A second brood of larvae is produced in early summer and in some years a partial third brood is produced later in the summer. Malathion is labeled for use against ICW. Another currant and gooseberry pest to be on the look out for in the spring is the **currant borer**. A relative of the raspberry crown borer, the adult moth has clear wings, blue-black body with yellow markings resembling a wasp. The adult emerges in the spring, mates and begins laying brownish eggs on the bark of canes. After hatching, larvae burrow into canes and begin feeding within the pith. No insecticides are labeled for currant borer although removal of weak canes in the spring and fall will help keep populations down. Other pests that might be observed attacking currants and gooseberries in the spring to early summer include the currant stem girdler (lays an egg in shoot tips and then girdles stem below) and gooseberry fruitworm (larvae feed inside young fruit, sometimes weaving portions of stems together with silk).

Weed Management in Matted Row Strawberries

Courtney Weber, Dept. of Horticultural Sciences, Cornell University, Geneva, NY

Weed control is probably the single most important factor determining longevity of matted row strawberry plantings in the northeast. It is critical for growers to successfully manage weeds in spite of limited herbicide availability and the high cost for hand weeding. A truly integrated approach to weed control is needed including chemical control, hand weeding, and cultural practices to successfully control weeds.

Chemical control is most appropriate at renovation and during strawberry dormancy in the fall or early spring. By late spring chemical control in strawberries is limited to grass control and to new, non-bearing plantings due to days-to-harvest restrictions and phytotoxicity to actively growing strawberry plants. Sethoxydim (Poast) can be applied for control of grasses less than 6 inches tall and actively growing up until the 7 days to harvest.

For new fields, the elimination of perennial weeds before planting with cultivation and a broad-spectrum herbicide such as glyphosate (RoundUp) is important for good stand establishment. Also an application of a preemergent herbicide such as napropamide (Devrinol) should give good control of germinating seeds for the first 4-8 weeks. As the residual activity of this herbicide disappears, cultivation becomes the main option until dormancy in late fall. Sinbar was recently granted a supplemental label on first year strawberries for control of annual grasses and broadleaf weeds. Sinbar should

be applied at 2-3 oz per acre after transplanting but before new runner plants start to root. If strawberry plants are allowed to develop new foliage prior to Sinbar application, the application ***must*** be followed immediately by 0.5 to 1 inch of irrigation or rainfall to wash the Sinbar off the strawberry foliage. Finger weeders, flex tine cultivators, and rolling cultivators can provide good weed control in new plantings and also help set runners into the row. A grass herbicide such as sethoxydim (Poast) can provide control of actively growing grasses only and may be appropriate for specific weed problems.

Hand weeding is important in late spring to clean up any weeds missed by fall and early spring herbicide treatments. Several weeds can be established and flowering by late spring leading to summer weed problems. Dandelions, field pansy (Johnny-jump-ups), and groundsel can all be flowering and distributing seeds widely at this time. These weeds can develop seeds from open flowers even after pulling or cultivation so the plants need to be removed from the field to eliminate the seeds. Field bindweed is also emerging at this time and needs to be nipped in the bud before it gets out of hand.

Cultural practices such as mowing border areas and clearing fence rows is important to avoid new weed seeds blowing into fields. Additional straw mulch can also be added to thin areas in fields to keep weed seeds from germinating while also maintaining soil moisture and keeping soil away from developing berries.

Managing weed pests through an integrated program of chemical control, good cultural practices, and vigilant hand weeding can help ensure the vigorous establishment of new plantings and a long life for matted row strawberry fields in the northeast.

Raspberry Weed Management

Courtney Weber, Dept. of Horticultural Sciences, Cornell University, Geneva, NY

A combined approach using chemical controls, cultural practices, and selective hand weeding can be used to effectively manage weeds in raspberry. Herbicides provide good overall control of most weeds. The key to successful chemical control is a vigorous, healthy stand of canes to crowd out competing weeds within rows. Between row control can be managed using a cover crop with herbicide banding to limit spreading, mulches, cultivation, or broad-spectrum herbicide application.

Chemical control is most effective in combination with the establishment of a vigorous stand of canes. In the establishment year, care must be taken to eliminate perennial weeds such a Canadian thistle and field bindweed with a broad-spectrum herbicide such as glyphosate (RoundUp) before planting because these weeds can spread from root pieces moved during cultivation. Once established in a planting, they are very difficult to control.

After planting, a preemergent herbicide such as napropamide (Devrinol) should be applied to eliminate germinating weed seeds. Be aware that tissue culture plugs and young canes can show increased sensitivity to many herbicides until they are well established and reduced rates may be needed. Shallow cultivation is also recommended in the establishment year to eliminate young weeds while allowing the new canes to develop. Deep cultivation is not recommended as it can damage the root systems and turn up new weed seed that would not be controlled by the

preemergent herbicide. Turf can be seeded between rows late in the summer to crowd out weeds and can be managed successfully by banding with a grass herbicide along the rows as the planting matures. Mulches within the rows as well as in row centers can be used to keep weeds down but care should be taken to maintain soil fertility. Also, in less than optimally drained soils or when growing root rot susceptible varieties, mulches can retain excess moisture and exacerbate root rot problems. Bare ground can also be maintained between rows with shallow cultivation, mowing, and/or broad-spectrum herbicides, but erosion can be a problem. However, special care must be taken to avoid disturbing the raspberry roots with the cultivator, to avoid weed seed development through regular mowing, and to avoid spray drift onto the raspberries when maintaining alleyways.

In established plantings, much of the chemical control is done in the fall or in the spring before bud break. By late spring, chemical control is limited to sethoxydim (Poast) for grass control. Be aware that Poast has a 45 days-to-harvest period in raspberry and by late spring may not suitable for early season varieties that can fruit in June such as Prelude, Killarney, and Reveille. Spot treatments of glyphosate with a wick applicator can be used to treat problem weeds making sure to avoid contact with the raspberries. This herbicide will translocate and kill not only the cane touched but also ones connected by the roots and can be spread not only by the applicator but by treated weeds blowing into the canes while still wet.

A well thought out herbicide program combined with timely mowing and selective hand weeding is an effective integrated approach to weed control in raspberry and can be used to successfully manage weed pests for maximum yields and profits.

WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, APRIL 20th, 2003

	Temperature				Growing Degree Days (Base 50)			Precipitation (Inches)			
	High	Low	Avg	DFN[1]	Week	Season[2]	DFN	Week	DFN	Season	DFN
Hudson Valley											
Albany	86	27	53	7	40	43	35	0	-0.7	1.75	-0.24
Glens Falls	84	23	49	4	21	21	17	0	-0.7	1.06	-0.89
Poughkeepsie	84	29	49	2	24	25	9	0	-0.81	1.12	-1.12
Mohawk Valley											
Utica	82	27	51	6	36	36	28	0.17	-0.67	1.79	-0.59
Champlain Valley											
Plattsburg	83	18	43	-2	11	11	6	0.13	-0.55	0.48	-1.34
St. Lawrence Valley											
Canton	79	20	45	3	18	18	15	0.07	-0.63	0.66	-1.19
Massena	77	20	44	1	15	15	11	0.24	-0.39	0.38	-1.38
Great Lakes											
Buffalo	75	29	52	7	41	41	33	0	-0.7	0.67	-1.2
Colden	80	28	50	7	24	24	21	0	-0.91	1.75	-0.79
Niagara Falls	78	29	51	5	38	38	28	0	-0.77	1.29	-0.83
Rochester	82	29	52	7	45	45	34	0	-0.63	1.25	-0.46
Watertown	75	22	47	4	25	25	21	0.04	-0.54	0.48	-1.14
Central Lakes											
Dansville	82	27	49	4	23	23	14	0	-0.7	1.74	-0.1
Geneva	84	28	49	4	29	29	22	0	-0.7	1.6	-0.31
Honeoye	85	22	52	7	41	41	33	0	-0.7	1.45	-0.5
Ithaca	83	25	49	5	23	23	18	0.07	-0.63	1.96	0.05
Penn Yan	84	29	52	7	38	38	31	0	-0.7	1.3	-0.61
Syracuse	85	28	52	6	40	40	31	0.16	-0.64	2.22	-0.01
Warsaw	78	23	49	8	28	28	27	0	-0.83	1.49	-0.75
Western Plateau											
Alfred	82	27	49	6	23	23	20	0	-0.76	1.77	-0.29
Elmira	84	22	50	5	29	29	23	0.05	-0.58	1.05	-0.71
Franklinville	80	25	49	8	18	18	18	0	-0.77	2.22	0.05
Sinclairville	80	29	51	8	27	28	25	0	-0.91	1.6	-0.93
Eastern Plateau											
Binghamton	80	29	50	6	37	37	32	0.1	-0.63	1.45	-0.58
Cobleskille	80	24	48	5	21	21	17	0	-0.77	2.57	0.38
Morrisville	80	25	46	3	20	20	18	0.05	-0.68	2.33	0.34
Norwich	83	24	48	4	20	20	16	0.28	-0.49	2.33	0.15
Oneonta	84	28	50	7	23	23	20	0.06	-0.77	1.97	-0.27
Coastal											
Bridgehampton	74	32	48	1	7	7	3	0	-0.91	4.23	1.56
New York	87	36	54	2	44	50	13	0	-0.91	2.42	-0.07

1. *D*eparture *F*rom *N*ormal
2. Season accumulations are for April 1st to date

The information contained in these weekly releases are obtained from the New York Agricultural Statistics Service (http://www.nass.usda.gov/ny/), who in turn obtains information from reports from Cornell Cooperative Extension agents, USDA Farm Service Agency, Agricultural Weather Information Service Inc., the National Weather Service and other knowledgeable persons associated with New York agriculture. Their cooperation is greatly appreciated.

WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, APRIL 27th, 2003

	Temperature				Growing Degree Days (Base 50)			Precipitation (Inches)			
	High	Low	Avg	DFN[1]	Week	Season[2]	DFN	Week	DFN	Season	DFN
Hudson Valley											
Albany	72	29	50	0	24	67	43	0.96	0.26	2.71	0.02
Glens Falls	73	23	48	2	21	42	28	0.92	0.22	1.98	-0.67
Poughkeepsie	69	33	50	-2	11	36	0	0.34	-0.52	1.46	-1.64
Mohawk Valley											
Utica	73	28	47	-2	20	56	33	0.71	-0.13	2.5	-0.72
Champlain Valley											
Plattsburg	76	23	45	-2	18	29	13	1.06	0.36	1.54	-0.98
St. Lawrence Valley											
Canton	78	24	45	-2	21	39	27	0.74	0.04	1.4	-1.15
Massena	80	24	45	-2	17	32	18	0.92	0.29	1.3	-1.09
Great Lakes											
Buffalo	79	27	47	-2	22	63	40	0.25	-0.45	0.92	-1.65
Colden	73	26	46	-1	15	39	27	0.36	-0.51	2.11	-1.3
Niagara Falls	79	28	47	-3	17	55	28	0.17	-0.56	1.46	-1.39
Rochester	77	28	48	-2	22	67	39	0.09	-0.54	1.34	-1
Watertown	77	27	47	0	23	48	34	0.3	-0.33	0.78	-1.47
Central Lakes											
Dansville	72	27	46	-4	14	37	12	0.34	-0.36	2.08	-0.46
Geneva	71	29	47	-2	17	46	25	0.21	-0.49	1.81	-0.8
Honeoye	73	27	46	-2	20	61	39	0.23	-0.47	1.68	-0.97
Ithaca	69	29	47	-1	12	35	19	0.47	-0.23	2.43	-0.18
Penn Yan	71	30	48	-1	21	59	38	0.24	-0.46	1.54	-1.07
Syracuse	75	29	49	-1	24	64	38	0.4	-0.37	2.62	-0.38
Warsaw	71	26	43	-2	12	40	32	0.42	-0.38	1.91	-1.13
Western Plateau											
Alfred	71	26	46	-1	13	36	24	0.37	-0.37	2.14	-0.66
Elmira	69	24	47	-2	19	48	30	0.13	-0.5	1.18	-1.21
Franklinville	72	24	44	1	12	30	24	0.32	-0.46	2.54	-0.41
Sinclairville	73	26	44	-2	11	39	28	0.77	-0.14	2.37	-1.07
Eastern Plateau											
Binghamton	66	29	46	-3	11	48	32	1.04	0.27	2.49	-0.31
Cobleskille	74	30	47	0	13	34	20	1.54	0.77	4.11	1.15
Morrisville	71	27	44	-3	8	27	16	1.07	0.3	3.4	0.64
Norwich	71	28	47	-1	10	30	16	1.03	0.2	3.36	0.35
Oneonta	78	29	49	4	20	43	32	1.49	0.64	3.46	0.37
Coastal											
Bridgehampton	61	32	47	-3	0	7	-8	2.4	1.49	6.63	3.05
New York	64	40	52	-3	20	70	1	0.93	0.02	3.35	-0.05

1. *D*eparture *F*rom *N*ormal
2. Season accumulations are for April 1st to date

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WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, MAY 4th, 2003

	Temperature				Growing Degree Days (Base 50)			Precipitation (Inches)			
	High	Low	Avg	DFN[1]	Week	Season[2]	DFN	Week	DFN	Season	DFN
Hudson Valley											
Albany	81	31	56	5	50	117	66	1.23	0.53	3.94	0.55
Glens Falls	80	29	53	3	37	79	45	0.71	-0.06	2.69	-0.73
Poughkeepsie	79	36	57	4	52	88	20	0.74	-0.2	2.2	-1.84
Mohawk Valley											
Utica	82	34	55	5	43	99	52	1.01	0.19	3.51	-0.53
Champlain Valley											
Plattsburg	79	28	51	2	25	54	19	0.96	0.32	2.5	-0.66
St. Lawrence Valley											
Canton	75	29	49	0	24	63	34	0.81	0.11	2.21	-1.04
Massena	75	28	49	-2	19	51	18	0.76	0.18	2.06	-0.91
Great Lakes											
Buffalo	75	37	52	2	26	89	41	0.86	0.18	1.78	-1.47
Colden	78	34	52	4	26	65	35	0.76	-0.08	2.87	-1.38
Niagara Falls	76	34	52	0	23	78	24	1.06	0.36	2.52	-1.03
Rochester	80	32	53	1	33	100	43	0.56	-0.07	1.9	-1.07
Watertown	77	27	50	1	25	73	41	0.34	-0.26	1.12	-1.73
Central Lakes											
Dansville	80	32	53	2	29	66	16	0.67	0.04	2.75	-0.42
Geneva	79	33	53	3	38	84	39	1.18	0.49	2.99	-0.31
Honeoye	82	28	53	2	34	95	49	0.87	0.21	2.55	-0.76
Ithaca	80	33	52	3	31	66	31	0.28	-0.42	2.71	-0.6
Penn Yan	80	31	54	4	45	104	59	0.8	0.11	2.34	-0.96
Syracuse	84	35	55	4	44	108	53	0.8	0.03	3.42	-0.35
Warsaw	76	32	49	2	18	58	35	0.66	-0.11	2.57	-1.24
Western Plateau											
Alfred	80	33	53	5	31	67	38	0.64	-0.06	2.78	-0.72
Elmira	84	31	55	5	44	92	51	0.35	-0.32	1.53	-1.53
Franklinville	78	26	51	5	27	57	40	0.94	0.17	3.48	-0.24
Sinclairville	78	32	52	5	28	67	41	0.56	-0.32	2.93	-1.39
Eastern Plateau											
Binghamton	78	36	55	5	40	88	51	0.24	-0.52	2.73	-0.83
Cobleskille	78	31	54	6	35	69	37	0.83	0.06	4.94	1.21
Morrisville	76	32	52	3	29	56	28	1.07	0.3	4.47	0.94
Norwich	80	32	53	4	28	58	25	0.58	-0.23	3.94	0.12
Oneonta	78	34	55	7	36	79	51	0.76	-0.15	4.22	0.22
Coastal											
Bridgehampton	73	35	55	5	39	46	11	0.07	-0.84	6.7	2.21
New York	79	49	62	6	90	160	44	0.16	-0.75	3.51	-0.8

1. *D*eparture *F*rom *N*ormal
2. Season accumulations are for April 1st to date

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WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, MAY 11th, 2003

	Temperature				Growing Degree Days (Base 50)			Precipitation (Inches)			
	High	Low	Avg	DFN[1]	Week	Season[2]	DFN	Week	DFN	Season	DFN
Hudson Valley											
Albany	71	39	56	2	44	161	71	0.1	-0.65	4.04	-0.1
Glens Falls	69	33	53	-1	22	101	36	0.26	-0.52	2.95	-1.25
Poughkeepsie	78	36	54	-2	30	118	4	0.23	-0.75	2.43	-2.59
Mohawk Valley											
Utica	73	40	56	3	44	143	60	0.22	-0.55	3.73	-1.08
Champlain Valley											
Plattsburg	74	34	52	-1	22	76	10	0.26	-0.37	2.76	-1.03
St. Lawrence Valley											
Canton	73	35	54	3	28	91	36	0.63	-0.02	2.84	-1.06
Massena	71	34	52	0	22	73	9	0.77	0.21	2.83	-0.7
Great Lakes											
Buffalo	75	42	58	5	57	146	62	0.63	-0.06	2.41	-1.53
Colden	74	38	55	4	36	101	45	0.73	-0.05	3.6	-1.43
Niagara Falls	74	39	57	3	48	126	33	0.66	0.01	3.18	-1.02
Rochester	75	39	56	3	46	146	48	0.27	-0.3	2.17	-1.37
Watertown	71	35	54	4	31	104	46	0.28	-0.28	1.4	-2.01
Central Lakes											
Dansville	75	36	55	2	39	105	18	0.54	-0.09	3.29	-0.51
Geneva	76	41	56	3	42	126	46	0.38	-0.25	3.37	-0.56
Honeoye	77	36	57	4	48	143	61	0.26	-0.37	2.81	-1.13
Ithaca	75	36	54	3	33	99	33	0.42	-0.28	3.13	-0.88
Penn Yan	75	39	56	3	43	147	67	0.21	-0.42	2.55	-1.38
Syracuse	74	39	57	3	47	155	59	0.17	-0.55	3.59	-0.9
Warsaw	74	38	53	4	27	85	38	0.71	-0.06	3.28	-1.3
Western Plateau											
Alfred	76	36	55	4	40	107	50	0.67	-0.03	3.45	-0.75
Elmira	79	35	56	4	48	140	66	0.17	-0.53	1.7	-2.06
Franklinville	78	30	54	5	29	86	51	0.33	-0.44	3.81	-0.68
Sinclairville	78	39	55	6	40	107	57	1.25	0.41	4.18	-0.98
Eastern Plateau											
Binghamton	71	40	55	3	41	129	60	0.27	-0.46	3	-1.29
Cobleskille	72	35	53	1	20	89	29	0.3	-0.47	5.24	0.74
Morrisville	73	37	53	1	21	77	22	1.2	0.41	5.67	1.35
Norwich	73	31	54	2	32	90	27	0.19	-0.65	4.13	-0.53
Oneonta	72	38	55	4	33	112	59	0.36	-0.61	4.58	-0.39
Coastal											
Bridgehampton	71	32	53	0	30	76	10	0.68	-0.21	7.38	2
New York	77	45	58	-2	60	220	41	0.45	-0.45	3.96	-1.25

1. *D*eparture *F*rom *N*ormal
2. Season accumulations are for April 1st to date

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Questions or Comments about the New York Berry News?

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