

2005 ATHROPOD PEST MANAGEMENT UPDATE

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We are getting to or moving beyond the early season pests (reviewed in the May edition of New York Berry News) into summer time pests. It has been a dry spring and recently quite warm. Generally, these conditions favor insect problems over diseases. Here at the experiment station in Geneva, our strawberry varieties are pretty much done flowering and we observed (ate) our first ripe Earliglow berries on about June 6.

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. We are probably getting past the optimum time to treat for these pests (petal fall and 10 days later). For sites with moderate pressure, a single insecticide (Confirm or Guthion), timed at 5 days post petal fall, can be effective. Other pests to keep an eye out for at this time are **plum curculio** (notice crescent-shaped 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). There are several summer arthropod pests of blueberries to be on the lookout for as the season progresses. **Blueberry maggot** is probably the most important one, although it has not been as serious a problem in New York as other blueberry producing areas such as New Jersey. The blueberry maggot overwinters in the ground as a pupa (the immature stage before becoming an adult fly). Emergence begins around mid-June and continues through much of the summer. Even though the blueberry maggot only has 1 generation per season, adults appear over an extended period (emergence is not very synchronized). Indeed, under some environmental conditions, pupae can stay in the soil for 2 or even 3 years before emergence. After emergence, adult females need to feed for 7 to 10 days before they start laying eggs. Eggs are inserted under the skin of ripening berries. Eggs hatch in a few days and the larvae feed and develop for around 20 days before dropping to the ground to pupate. During the early part of larval development, there are no obvious external symptoms on the blueberry that it is infested. Later the berry may become soft and appear to ripen early. An important part of controlling blueberry maggot is learning when emergence begins. Yellow sticky cards, baited with a food source for the adult flies (protein hydrolysate and ammonium acetate) can be used to detect the first flies of the season. These traps are commercially available. Place traps along the edge of the planting or in woods near wild blueberries to better estimate when activity begins. For problem fields, regular applications of pesticides, beginning after activity is detected and continuing until harvest, is necessary to adequately protect fruit. Adult **Japanese beetles** can also present problems for blueberry growers during the summer, although this is less true for U-pick operations. The adults emerge at the end of June and into July and feed both on blueberry foliage and to some extent on fruit. The damage appears as skeletonized leaves or surface scarring of the fruit. During harvest beetles can also be dislodged from the plant and contaminate the packed berries. Several insecticides are available that provide moderate to good control of Japanese beetles. Note, though, that beetles are very mobile and will fly into fields from long distances.

Raspberries

We covered most of the relevant arthropod pests of raspberries in the last edition of the electronic newsletter. **Tarnished plant bug (TPB)** and **cane borers** continue to be a threat into the summer; tarnished plant bug nymphs and adults feed on developing fruit and cane borer larvae feed inside canes. TPB overwinters as an adult. In the early spring, these overwintered adults feed and produce offspring on early flowering weed species and move into strawberries. This year's

spring generation of nymphs are just becoming adults now and present a threat to both later fruiting varieties of strawberries and summer raspberries among many other crop plants. Given the warm and dry weather it may turn out to be a serious plant bug year so do some scouting. The threshold of TPB in raspberries has not been well worked out, but consider some sort of control if greater than 20 to 30% of flowering clusters have adult or immature TPB. **Potato leafhoppers** (both adults and immatures) are also showing up in New York farms. This species overwinters as adults in the southeastern USA and then migrates north in spring and early summer (it does not overwinter). They feed on a lot of different crops including many small fruits like strawberries, raspberries, and grapes. They use their soda-straw like mouthparts to pierce the water conducting vessels of the plant (xylem) and suck out water and nutrients. If this were all they did, it probably would not cause much problem. But they also inject saliva into the plant and for some species, this causes a strong reaction in the plant. Typical symptoms include yellowing of leaf margins and distorted and possibly stunted leaves. Different plant species respond differently and some are very sensitive while others are not. Raspberries, grapes, and strawberries are sensitive. The adult potato leafhopper is iridescent green and wedge-shaped while the nymph is usually green and moves sideways in a unique manner when disturbed. If injury to foliage is moderate to severe, control may be necessary. Sevin [carbaryl] and Malathion 57 EC are labeled for potato leafhopper on raspberries but note there is a 7 days to harvest restriction for Sevin but only a 1 day restriction for Malathion. I should also 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 a few years ago there is now a miticide registered in New York for control of TSSM (Savey DF). 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). As fruit ripens, **sap beetles** can become a problem. There are several species. The most obvious one is some times called the picnic beetle. The adult is black with large white or orange spots. We have also been finding the smaller strawberry sap beetle in summer and fall bearing raspberries. The adult beetles are attracted to damaged or over ripe fruit where they feed and may spread fruit rots. Larvae can also infest the fruit but this generally happens after the fruit is over ripe and not marketable. Malathion 57 EC is labeled for sap beetle in raspberries. **Japanese beetles** can also cause injury to raspberry foliage and fruit during July and early August. August is the time that the adult **raspberry crown borer** makes its appearance. The adult is a very attractive moth that superficially resembles a yellow jacket. You may notice the adults resting on foliage during the day. It's the larvae, though, that cause the major problem. Reddish-brown eggs are placed on foliage in August and September. After hatching, the larvae find a protected place near the base of the cane to spend the winter. The next spring the larvae enter the crown and roots where they spend the next year. In the second year the larvae continue to feed until early summer, at which time they form pupae and then emerge as adults in late summer to start the cycle over again. During the growing season, look for withering, wilting, and dying canes, often with half-grown fruit. Destroying these canes (including the crown area) may help reduce crown borer populations. Guthion is currently labeled for control of crown borer on raspberries (applied to control larvae in spring) but that this registration will likely be lost next year.

Strawberries

Flowering is complete and fruit is quickly ripening. For later maturing cultivars **tarnished plant bug** (TPB) can still cause injury to fruit so keep on monitoring for nymphs. For day-neutral cultivars, TPB becomes an increasing problem for the August harvest. **Spittlebug** can still be a problem leading up to harvest. You can see the frothy spittle on leaves, stems, and flowering racemes starting about 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. 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 spittlebug masses is one mass per foot row. As fruit ripens, **strawberry sap beetles** will become more active. Recent research indicates that the adult beetles spend the winter in surrounding woods and then move into strawberry fields as fruit begins to ripen. Look for evidence of feeding damage on the underside of ripe fruit that is touching the ground (small shot holes; you usually don't see the beetle itself). 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: Danitol and Brigade. Note that Brigade does not have a preharvest interval while for Danitol it is 2 days. For both materials, good coverage is likely to be important for its control. It is also worth mentioning **Root weevil** at this time. The larvae have been busy feeding on roots and crowns since last summer and are getting close to completing development and pupating to adults. If you have questions about whether you have root weevils, this is a good time to look since the larvae will be large and easy to see. Dig out the crown and roots of a couple of plants in different sections (especially look near weak-looking sections) and sift through the soil for small (eighth to quarter inch), legless, C-shaped, pale white grubs. After emerging around harvest time, the adults feed for a few days before starting to lay eggs. Chemical control (Brigade) is targeted at the adults. Look for characteristic adult feeding damage on leaves (notching from the edge) to help determine timing. Some growers have also had success controlling root weevil larvae using parasitic nematodes. These can be applied either in the spring (late April and early May) and/or in the fall. Use sufficient water to get good penetration. Rotation out of strawberries is the best remedy for root weevils.

Currants and Gooseberries

Imported Currant Worm (ICW) has completed its first generation and is getting started on the second. Larvae are greenish in color with yellowish ends, a black head region, and covered with black spots. Full-grown, they can get to be close to 3 inches long. They initially feed in colonies but as they become larger, feed singly. Malathion is labeled for use against ICW. Other currant and gooseberry pest to be on the look out for in the spring and early summer include the **currant borer** and **gooseberry fruitworm**. The currant borer, as an adult, is an attractive moth with 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. The gooseberry fruitworm is also in the moth group. Larvae feed inside young fruit, sometimes weaving portions of stems together with silk. Finally, **two spotted spider mite** also feeds on currants and gooseberries and in some years, can cause considerable damage. Look on the underside of leaves for the mites and their webbing. Keep an eye out for reduced plant vigor, bronzing of foliage, and webbing on leaves and shoot tips.

(Editor's note: See [NYBN Vol. 3 No. 4](#) for pictures of the pests described above)

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