# BLOSSOM TIME APPLICATIONS

As blossom time rapidly approaches, many growers may be pondering what course of action they will take if faced with the dilemma of treating for insect pests during bloom. As most growers know, treating with our conventional chemical insecticides during bloom is not recommended due to pollinators actively foraging the cranberry blossoms. Many of our conventional chemicals can be toxic to pollinators if applied improperly near blossom time. There are alternatives for growers to consider if faced with treating insect problems during bloom.

Growers should consider using Bt products (DiPel, Biobit, Agree, MVP, etc.). Bt's are quite specific. Most can provide good control of lepidopteran insects (caterpillars) and offer low risks to beneficial insects. Bt products should be applied when caterpillar larvae are young and small. Bt's don't offer the quick knockdown of insects like conventional insecticides; they have to be ingested by the larvae and act as stomach poisons. Larvae generally stop feeding within a few hours of feeding on Bt treated foliage and die within a few days. Treatments may have to be repeated if there is a continuous insect hatch. Consult product labels for correct rates. Remember that not all Bt's are labeled for use on cranberry.

Try products like Pyrenone. Pyrenone contains a naturally occurring insecticide, pyrethrum, derived from pyrethrum flowers grown in Africa. It also contains piperonyl butoxide as a synergist. Evening applications of the contact poison can offer growers good control of some insects such as blackheaded fireworm. The product is broken down by sunlight and residue levels are low if applied the prior evening. Use 8-12 ounce per acre rates to knock down pest levels until the bees can be removed. More than one application may be needed to get you through the blossom period.

You should avoid chemical insecticide treatments during bloom. Wettable powder formulations may be particularly hazardous, since they may not always completely dissolve, and can leave powdery residues on plants that can be carried back to foraging pollinator hives. Also, stickers should be avoided since they can extend the time that toxic residues are present, increasing the potential of pollinators being injured.

When using Bt's or pyrenone, always make applications late in the evening. Bees don't forage in darkness, and applications made during this time can minimize pollinator hazard. Before making applications, run sprinkler systems 10 to 15 minutes to discourage pollinator activity. This chases any foraging insects from the beds, and can also help reduce the chances of phytotoxicity associated with some types of pesticide application methods. Run sprinkler systems in the morning. Bees will be discouraged from entering the beds when vines are wet, and the extra water should help reduce residues to levels safer for pollinators.

Finally, whatever pest management measures you employ, if bee hives are present be sure to keep the beekeepers informed. They can work with you to avoid bee hazard in case of a situation requiring immediate pest suppression.

*Leroy Kummer, Ocean Spray Cranberries.*

# NATURAL INSECTICIDES

I commend those growers that have built bird houses, bat houses, and created a favorable environment for other winged creatures that work for us. Did you know that bats actually do a better job of keeping a backyard free of mosquitoes than any man-made deterrent? Not to say anything about a marsh. From the "Lady Bug" teams' perspective we have noticed less populations of the friendly mosquitoes in areas with bat houses (Hey, we love to scout those areas!) Bats are out and about during the night hours controlling those nocturnal pests while we sleep. Did you know that even the little -sized insects per hour? A single large colony eats about a quarter of a million pound of insects every night! That is impressive!

Did you ever notice the blackbirds working the beds? Many build their nests right in the beds. What are they doing there? My observation is that they are not eating the vines.

The dragonfly populations are quite large this year. We have observed then feeding on deer flies and horse flies.

It is such a pleasant working environment for us to listen to the songs of our many fine feathered friends. What a bonus knowing that they are indeed feeding on what we call pests.

**OBSERVATIONS FROM THE FIELD FOOD FOR THOUGHT.**

How well did your vines overwinter? We have observed areas that showed excessive leaf drop, stripped vines, and injured buds. The hot humid weather of late brought us some healthy growth seemingly overnight. Yet we are seeing side shooting and vegetative growth in areas where we would prefer to see reproductive growth. What happened? Did we hurt them in the fall or the spring? Was it our ice? Did the snow coverage have an influence in this damage? What about the weather conditions of late summer 1995? (hot, humid, untimely rain showers) Oxygen deficiency? Mechanical damage? Drainage?

Many theories are being given. I believe that what we are seeing cannot be attributed to just **ONE** cause. I believe that there is a combination of events that virtually was out of our hands that contributed to this stress and yet there are some practices that we need to address.

Many growers are retracing their steps from harvest to the spring. Some are going to be testing the oxygen levels in the water, from the reservoir to bubbling over the flood gates. Adjusting the time we allow water on the beds is a real issue. Some are contemplating having different width harvest equipment so that injury will not be in the same tracks each year. Others are looking into their fertilization, herbicide and insecticide programs more closely. Just where and when are we stressing the vines?

*Jayne Sojka, Lady Bug IPM*

# MATING DISRUPTION

Insects communicate with each other through the use of chemicals called pheromones. Ants will release a pheromone to lead other ants to a food source. Some insects release an alarm pheromone to warn other insects of impending danger. Sex pheromones are released by many species of female insects to aid male insects to find the females and mate. Mating disruption involves using sex pheromones to prevent male insects from finding female insects and mating.

Scientists have been working on mating disruption techniques since the early 1970's. Mating disruption has been used successfully to control pests in other crops. Some examples are pink bollworm in cotton, oriental fruit moth in peaches, and codling moth in apples.

Mating disruption may work through a variety of means. It is important to understand the potential mechanisms for mating disruptions to know how to use the pheromone products on your marsh. In practice more than one mechanism is working at the same time. The mechanisms are:

**ADAPTATION OR HABITUATION:** Exposure to a stimulus can reduce the ability of the nervous system to respond to the stimulus over time. Once an individual insect is habituated they no longer respond to a given stimulus. In humans this would be similar to people who live near railroad tracks or busy highways who no longer are bothered by passing trains or trucks.

**FALSE TRAILS:** If numerous sources of pheromone are placed in an area male moths will follow trails to false sources. If there are enough false sources males would never find females. The false sources need to be distributed evenly over the area and ideally would release pheromone at about the same concentration as a "calling" female. Males won't respond to a concentration that is too high.

**MASKING:** A high and uniform background level of the pheromone is applied to mask the pheromone released by females. The male can't find a female in this "pheromone fog".

**IMBALANCED SENSORY INPUT:** Most moth pheromones have more than one component. Males are attracted to the correct ratio of the elements. If a single element is released in elevated levels the male would never find a pheromone trail with the correct balance.

Mating disruption offers many advantages to conventional insecticide control. First, there are no pesticide residues. Consumers can purchase fruit and fruit products with confidence. Workers will also have less exposure to chemical insecticides. Pheromones are not toxic to mammals at the concentrations used in mating disruption. Existing pesticides will be used much less and resistance should not develop to these pesticides as quickly. With the loss of several insecticides to the re-registration process this is critical.

Some secondary or minor pests may become a larger problem since they would no longer be controlled by insecticide applications made to control primary pests. However, their predators would also not be controlled so over time there is a greater chance that biological control will emerge.

Mating disruption will not work for every pest in every situation. In cases where alternate hosts for pests are available outside the marsh such that insects could mate elsewhere and then the females fly to the marsh to lay eggs, mating disruption alone will not be adequate. Also, if neighboring marshes do not control the target pest females could mate on an adjoining marsh and then fly to the "mating disruption" marsh and lay eggs. This approach is most effective either in isolation or where very large tracts can be treated.

Mating disruption will likely require more intensive monitoring to determine if control has been adequate. It may also be necessary to monitor secondary pests and their natural enemies more closely. The cost of mating disruption will likely be higher, at least in the short run, than using conventional insecticides. The actual cost will be dependent on how the pheromone is dispensed, the additional labor for monitoring as well as the cost of the pheromone.

Pheromone products used to prevent, destroy, repel or otherwise mitigate a pest problem are regulated by the U.S. Environmental Protection Agency. However, the EPA recognizes that these products are different than conventional pesticides so the regulatory process is somewhat different. The EPA has waived the requirement for a residue tolerance on food crops since the chances of a detectable residue are near zero.

Research is currently underway on mating disruption to control blackheaded fireworm on cranberry. It will still likely be several years before the technology is sufficiently developed to be used commercially. Mating disruption potentially offers cranberry growers another means to manage insect pests.

*Teryl Roper, UW-Extension Horticulturist*
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