Ohio Fruit ICM News

Editor: Shawn R. Wright
Ohio State University South Centers
1864 Shyville Rd., Piketon, OH 45661
Phone (740) 289-2071 extension 120
E-mail: wright.705@osu.edu
http://southcenters.osu.edu/hort/icmnews/index.htm

Volume 10 (9) April 18, 2006

In This Issue

Calendar - Newly added in ***Bold***

Apr. 19 Commercial Fruit Grower Meeting, Bennett's Orchard, Buffalo, KY 42716. Registration begins at 10:00. For more information contact John Strang 859-257-5685; e-mail: jstrang@uky.edu

Apr. 22, Kentucky Nut Growers' Association Spring Meeting, Elizabethtown Extension office, Elizabethtown. Contact: Kirk Pomper 502-597-5942, e-mail: kpomper@dcr.net

June 11-17, International Fruit Tree Association Summer Orchard Tour to Mexico www.ifta.org.

Aug. 1 UK Horticultural Research Farm Twilight Tou***r***, Horticultural Research Farm, Lexington, KY. Contact John Strang 859-257-5685; e-mail: jstrang@uky.edu

Aug. 30-Sept.1 North American Fruit, Explorers (NAFEX) and SFF Annual Meeting, Holiday Inn North, Lexington, KY. Contact John Strang 859-257-5685; e-mail: jstrang@uky.edu

Jan. 8-9 Kentucky Fruit and Vegetable Conference and Trade Show, Holiday Inn North, Lexington, KY. Contact John Strang 859-257-5685; e-mail jstrang@uky.edu

Comments from the Editor

One of our growers in southern Ohio contacted me last Friday to say they were moving hives into the orchard and would be at full bloom on Sunday or Monday. Therefore, I have included a number of articles on bees and pollination from the Michigan State University Fruit Crop Advisory Team Alert newsletter Vol. 21, No. 2, April 11, 2006 (http://www.ipm.msu.edu/cat06fruit/f04-11-06.htm). For our central and northern growers this should be timely information. I encourage you to check out the OARDC bee lab website as well http://beelab.osu.edu/.

Pollination for Crops and Pesticide Use by Zachary Huang, MSU Entomology

(Source: MSU Fruit Crop Team Alert newsletter Vol. 21, No. 2, April 11, 2006)

Pollination is the crucial first step toward obtaining good yields. Most fruits grown in Michigan, including peaches, pears, apples, cherries, blueberries and cranberries, all require insect pollination to ensure good fruit set. California almond growers paid as high as $160 per colony of honey bees spring of 2006, and although we won't be that high in Michigan, our prices for pollination will also be affected this year due to overwintering mortality. Last year (winter of 2004) the national average was 50% mortality.

To find a beekeeper nearest to you, please check the web site http://beebase.cyberbee.net where you can search beekeepers that provide pollination in Michigan. You can also register your needs for pollination so that beekeepers can find you. A website with information on bee biology, research and beekeeping is also available at MSU http://cyberbee.msu.edu/. To learn whether your fruit crop would benefit from bee pollination, please check the online pollination book at http://gears.tucson.ars.ag.gov/book/index.html.

Growers want to maximize crop production and beekeepers want to maintain their colonies healthy and productive. Sometimes there can be a conflict between the two when bees are placed in fields for pollination and spraying is needed for disease or pest control. Because bees are insects, most insecticides will have some toxicity to bees, so close cooperation among growers, pesticide applicators, and beekeepers is needed to protect bees against poisoning.

Some pesticides cause direct kill of foragers. This happens when bees are on flowers when the pesticide application is conducted, or when the pesticide used is highly toxic to bees. The highly toxic pesticides actually leave no evidence because nearly all bees die in the field, before bees make their way home. Other types of pesticides allow bees to return home, and then die inside the hive. This type of poisoning is the easiest to diagnose, with a large pile of dead bees in front of a bee hive, usually with their tongues sticking out. Some chemicals do not directly harm adult bees, so they are brought back to the colony and cause damage to young, immature stages of bees (brood). Captan is of this type and

does not kill adult bees but larvae exposed to it die or develop into malformed adults. The French beekeepers have experienced the “mad bee disease” recently, in which millions of bees simply become disoriented and not finding their way home. A suspected culprit was thought to be the chemical Gaucho (imidacloprid) applied to sunflowers to protect against parasites, but there is still much discussion about this issue. The French government in 2001 ordered a two-year extension of a ban on spraying this chemical on sunflowers, to allow more study of its impact on the nervous systems of bees. The take-home message is that diagnosis of bee poisoning can be difficult, and growers should take care with any use of pesticides during bloom, and follow the directions for bee safety.

As a rule of thumb, if you have the same pesticide in both dust and liquid form, use the liquid form. Because hairy bee bodies maximize pollen collection, pesticides applied as dusts are more hazardous than sprays to honey bees. Micro-encapsulated pesticides are worse because bees sometimes mistake these granules as pollen and bring them home, causing long-term, chronic damage to the entire colony. ULV formulations can be more toxic to bees because of its higher concentrations, and daytime aerial application of pesticides can be bad news for bees, because many bees in flight will be hit.
Time of application can be important because many foragers will die when sprayed pesticides land on bees directly or is mixed with nectar and bees are foraging on it. Consider working with beekeepers on the spray schedule. Give him or her some options considering the chemical sprayed and the schedules of both the grower and beekeeper. For example, tell the beekeeper a spray is really necessary but you are concerned about his bees. “Should I spray tonight 7:00 to 9:00 PM, when bee activity is minimal; or do you think it is better to close the colonies tonight and I spray tomorrow morning 7:00 to 9:00 AM, and then release the bees around noon?” This type of discussion will often lead to satisfactory comprise for both sides. It does not cause any harm to bees for the colonies to be closed for a few hours. During a very hot day, overheating can be an issue, but can be worked out also, if water is provided abundantly (use soaked burlap at the hive entrance and apply water every 2 hours in July-September).

Use a specific pesticide targeting the pest you want to control is often better for you (less harm to other beneficial insects), and for the beekeeper. Most pesticides are labeled as not toxic, moderately toxic, or highly toxic to honey bees. Remember that some fungicides, as well as herbicides, can be toxic to bees. A list of pesticides of low, moderate and high toxicity, as well as considerations for both growers and beekeepers, can be found online at http://ohioline.osu.edu/hyg-fact/2000/2161.html

A New Pollinator in Town by Nikki Rothwell, MSUE District Fruit IPM Educator (Source: MSU Fruit Crop Team Alert newsletter Vol. 21, No. 2, April 11, 2006)

In 2005, the Northwest Michigan Horticultural Research Station (NWMHRS) was given a sizable donation of *Osmia cornifrons*, horn-face bees (HFB). Much of the initial research was conducted on Balaton ® cherry, a Hungarian variety that produces disappointing yields compared with the traditional Montmorency variety, especially in years when cool conditions persist during the bloom period. We hypothesized that fruit set would be improved if more pollen was transferred to the pistil more quickly after

flower opening, thus increasing the chances for successful fertilization. Under Michigan's variable spring conditions, we proposed using HFB to increase fruit set and ultimately help produce more cherries.

Osmia cornifrons is a pollinator that is native to Japan where they pollinate over 80 percent of Japanese apples and are considered as successful as honeybees for pollinating apples. These bees also demonstrate a distinct preference for Rosaceous plants. HFB are solitary and because they are not part of a social colony like honeybees, all females are capable of reproducing and each female must forage for its own offspring. This intensive foraging behavior is necessary to supply provisions for their larvae, and this foraging activity makes them desirable as pollinators in orchard settings; *O. cornifrons* visit approximately 4,050 flowers per day compared to honeybees that visit only 729 flowers in that same time. HFB adults are active for six to eight weeks, April through June, which are the peak pollinating months. These bees are easy to manage, reproduce without difficulty, and do not sting. They also do not require intensive management year-round because after pollination, the offspring develop in their nesting boxes and adults are not seen outside the colony until the following spring. There is only one generation of HFB per season.

With grower-funded support, we conducted our initial investigation into the effectiveness of HFB in Balaton ®. Preliminary observations suggest that HFB fly at cooler temperatures than honeybees. This species will also fly under slightly cloudier conditions and higher wind speeds than honeybees. Our foraging behavior study showed that HFB forage for a significantly longer amount of time per flower than honeybees, and HFB visit significantly fewer flowers per tree and for fewer flowers per minute than honeybees.

Horn-face bees have been shown to increase apple fruit set in Japan; fruit set by HFB was 82x that of honeybee fruit set. In order to quantify HFB's pollinating capability in Michigan, nesting buckets were placed in Balaton ® orchards, two-three days before cherry bloom. Each orchard block was divided in half, and one side was stocked with HFB while the other half contained honeybees. Three orchards had significantly higher fruit set with HFB, while the remaining five orchards did not. Balaton ® yields were collected at harvest, and data suggest HFB may have the ability to pollinate as well as or better than honeybees, but only one orchard showed significantly higher yields with HFB. As most of our results are preliminary but promising, further research is warranted and needs to be expanded to other cropping systems. Determining the optimal timing to deploy HFB in orchards is the key to managing the bees and improving yields. Much of the 2005 data suggest that HFB were placed into the orchard too late to be most effective.

Recommendations based on preliminary results in Michigan

Based on work from Batra, we are recommending approximately 250 female HFB for a 1-acre block of cherries and apples. If each 6-inch straw contains eight bees, four to five of those are males and the remainder of the bees is female. Currently, we have no good way of detecting how many bees are actually in the straws, but if there is mud filled out

to the end, we can take a stab at six to eight bees per tube. Therefore, depending on how many bees per straw, we can suppose that there needs to be approximately 70 full straws per bucket per acre to meet the recommended rate.

HFB nesting buckets should be hung in a visible location as observational data suggests these bees use visual cues to locate their nesting sites. At the NWMHRS, we are placing the buckets into apple boxes tipped on their sides, such that the buckets can be hung from the side slats of the wooden apple box. Last year, we wired buckets to the tops of the tipped up apple box with standard wire at the most horizontal angle possible. HFB in the wild use old beetle holes in trees for nesting, and because of the nests position in the wild, horizontal nesting sites are conducive for bee entrance. We want to mimic the wild system, so buckets placed horizontally will work better than buckets placed at an angle. However, make sure the bucket tilts slightly downward to prevent rain from collecting in the bucket. Also, make sure to tie the buckets tight so they do not swing in the wind.

We recommend placing one bucket in the middle row if you do not have many bees. If you have enough bees, I would recommend splitting the 70 full tubes into two buckets, 35 full tubes per bucket, with the remaining tubes with no bees. Buckets should be placed a third of the distance into the orchards from both ends, either north or south or east or west. These bees do not forage as far as honeybees in terms of distance, approximately 200 m, so placing the 250 females (70 full tubes) in the middle of the 1-acre block may be beneficial. Splitting those full tubes into two buckets to try to spread the bees out through the orchard may be even more advantageous.

Based on 2005 data and more recent literature, we recommend placing HFB into the orchards 1.5 to 2 weeks prior to bloom. Last year, we recommended putting them into the orchard three to four days before bloom, but we think this timing was much too late for optimal foraging activity (aka. pollination). The literature suggested that they needed a food source or they would “take off.” We did not see this behavior last year as their “homing” behavior was much stronger than their desire to depart to look for a food source. The major behavior we all noticed last year was their need to mate before major foraging activity. Males chew through the mud first, as they are laid toward the opening of the tubes. The males feed a bit, but they are more concerned with emerging females. Emerging and mating took longer than anticipated last spring.

Although the following information will vary based on temperature, males usually emerge within three days of placement into the orchard (as long as temperature is above 55°F), and females will emerge by day 6. Again, they will need a few days to mate and feed. Females must collect pollen and nectar for their offspring, and these females will forage excessively for their brood; hence, the majority of pollinating potential comes from these egg-laying females. In order for females to reach the rigorous foraging stage, they must emerge, find a mate, mate, feed and then she will begin to look for food. This timing is not well known for Michigan orchards, but our current recommendations based on last year’s results are to place the buckets into the orchard 1.5 to 2 weeks before bloom. Again this timing will be dependent on temperature as they emerge based on temperature—the warmer the day, the faster they will emerge and vice versa.

Additionally, these bees do not live long, approximately 35 days, so we want to time emergence close to fruit bloom in order for these bees to use fruit pollen for a food source rather than other pollen from other blooming plants.

HFB females use mud to separate the cells of their nest (tube). Therefore, somewhere near the hive, a mud source is needed, especially in a dry year. The recommended mud source is a 1 to 1.5 ft deep trench, approximately 20 yards from the nesting sites; this trench provides bees with a low angle to approach the nest. The soil in the trench should be kept moist, but there should be no standing water. The bees are capable of locating their own source of mud, but in the event of a droughty season, a mud trench is a good idea.

The only thing needed to propagate more *O. cornifrons* is a 6- to 8-inch depth hole with a 5/16 inch diameter. There are many methods of creating these "nesting sites:" drilling holes into wooden blocks of wood, pvc pipes, cardboard tubes and potentially many more. However, the key point to remember is that these bees will need enough empty holes to increase the size of the colony, and each female is capable of producing two to four nests each year. Therefore, if we put out 250 females per acre, a minimum of 750 empty nesting tubes are needed.

Another observation from 2005 is that the emerging bees prefer to reestablish the tubes from which they emerged. They will not start creating nests in an empty bucket of tubes unless the "used" bucket is completely full. Therefore, we are recommended setting up your buckets with the minimum number of occupied tubes (about 70 tubes with 250 females) and the remainder of the tubes should be empty. We have used old square "cherry" buckets with wide screens to hold the tubes in the bucket, but any bucket would probably work.

Pollination Tips for Tree Fruit by Jim Nugent, District Horticulturist, MSUE, Nikki Rothwell, District Fruit IPM Educator, MSUE (Source: MSU Fruit Crop Team Alert newsletter Vol. 21, No. 2, April 11, 2006)

All of the tree and small fruit crops grown in northwest Michigan (except grapes, which are wind pollinated) require insects for pollination. That's right – wind plays virtually no role in pollination; the job is done by bees! Native wild solitary bees are present and populations likely vary a great deal from site to site, but their numbers alone are generally not adequate to provide the necessary pollination to achieve good yields. Feral (wild) honey bees used to be plentiful and greatly aided pollination, but today no feral honey bees survive the winter due to the introduced mite parasites. This all means that providing additional bees is a necessity to achieve desired yields, particularly in those years when weather conditions are unfavorable for pollination.

Recommended density of good quality honeybee hive per acre:

Apple and Pear 1-3 hive per acre
Sweet cherry and Balaton® 2-3 hive per acre

Montmorency tart cherry, plum, and peach 1 hive per acre

Newer, higher density apple plantings, with a single cultivar interplanted with a few pollenizers, require more bees per acre than the older, multi-variety traditional plantings. Likewise, use higher bees rates in sweets where one non-selffertile variety represents 76% or more of the planting.

Pallets of bees should be spread out to minimize flight distance to flowers, with a maximum of 300 yards between colonies. Place in a sunny location if possible.

Place bees in orchards prior to the first blossom opening. The first blooms to open in apple (king blooms) generally produce the largest fruit. The first blossoms to open in cherry have a higher percent fruit set.

Control dandelion to reduce competition for bees.

Using Bees for Pollination of Small Fruit Crops by Rufus Isaacs and Zachary Huang MSU Entomology (Source: MSU Fruit Crop Team Alert newsletter Vol. 21, No. 2, April 11, 2006)

According to calculations by Calderone and Morse (2000), the value of honey bee pollination to agriculture in the United States is as high as $US 14.6 billion per year. In Michigan alone the total value to the main fruit and vegetable crops dependent on honey bee pollination is about $300 million per year. Bee pollination of small fruit crops provides the essential cross-fertilization of plants that promotes larger, earlier berries and increased percentage of fruit set.

In general, flowers of small fruit crops are less attractive to honeybees than other flowers due to the shape and the relatively low “reward,” so a different strategy is required than you might use for apples, which need bees early. You want to have your crop starting to bloom before bringing bees in so that bees tend to forage more on your crop. If brought in too early, bees will learn to forage elsewhere and when your crops bloom, they are not attractive enough to get the bees "back" to where you want them. Blueberry flowers have about three days to be pollinated after the flowers open, but you want the bees to stay in the field, so move bees into blueberry fields after 5% bloom but before 25% percent of full bloom. The "late" strategy is especially important for cranberries, which is not very attractive to bees. Luckily, cranberry flowers will stay open for a while if not pollinated, and the petals will turn to a rosy color if not pollinated in time. In cranberries, it is better to wait until 10% bloom in order to maximize the yield. If you see too many flowers turning rosy, this means you did not have enough pollinators, so make sure you increase the number of bee hives next year.

Most growers will already have their pollination contracts set, but expect to pay anywhere from $40 to $70 per colony for spring fruit pollination. There is a range here because if you only need 10 hives, you might be expected to pay a higher price than the other grower who is renting 500 hives. Colonies might be also of different strengths. Try

to deal with the same beekeeper year after year in your area so you know what to expect and can build a good working relationship. If the beekeeper is new in the pollination business, make sure he or she knows your requirements and make sure you sign an agreement for pollination purposes.

The invasion of Varroa mite has decimated the numbers of feral (unmanaged, wild) honeybee colonies that used to contribute to pollination in addition to rented colonies. The proportion of pollination caused by feral bees relative to managed colonies is unclear, but it is safe to say that we need higher densities today than when feral bees were present. Recommended densities of managed bees are three hives per acre for cranberries, and one hive per acre for strawberries and raspberries. Research in blueberries has shown variation in their needs for bee pollination. This is mainly because cultivars with short open flowers and good nectar production are easier to pollinate. Because of this, varieties like Rubel require one strong hive on two acres, whereas Jersey may benefit from increasing hive densities to five per acre. The average is around two hives per acre. In general, a good rule of thumb is that you'll need four to eight bees per plant in the warmest part of the day during bloom to achieve good pollination.
Do not cut corners in respect to putting enough bees in your crops. Investing some money to have enough colonies there at the right time will provide returns in the form of improved yields.

If possible, place the colonies in a sheltered location with the entrances facing east. This will encourage earlier activity as the hive warms in the morning sun. Hives should be spread out around the field to maximize floral visitation, with a maximum of 300 yards between colonies.

Many other helpful insects are active in your fruit crop, and with 20,000 recorded species of bees worldwide, some local native bees are probably active in Michigan’s small fruit crops providing free pollination. Bumblebees and other native species can be seen looking for flowers already in and around fruit crops, and their activity generally remains high when weather conditions turn too cold or wet for honeybees. These native bees may be insufficient to provide adequate pollination for good yields, however, and cannot be relied on to stand alone as your sole pollination source. By providing the right nesting habitats and food for the bees after your crop has flowered, you can enhance the local populations of native bees around your crop. This is a long-term process and you’ll need several years of experimenting before these bees can become a reliable part of your pollination planning. Ongoing research at MSU is investigating strategies for conservation of native pollinators in Michigan blueberries, and we expect this work to be relevant to many other Michigan fruit crops.

Do not apply broad-spectrum insecticides when flower buds are open or you may kill a significant number of pollinators. Bee hives should be removed immediately after pollination if post-bloom pesticide applications are planned. By monitoring for pest problems carefully during bloom, growers can help minimize the need for pest control. If an insecticide application is necessary during bloom, the compounds that are least toxic to bees should be used, with careful observation of the pollinator-restrictions on the label.

Two insecticides that can both be applied during bloom for control of moth larvae in blueberry and cranberry are the Bacillus thuringensis (Bt) products, and the insect growth regulator tebufenozide (Confirm ®). Good coverage is required for both, and a spreader/sticker should be used to improve effectiveness. Inform the beekeeper two to three days before application so that precautions can be taken to minimize bee exposure. Evening application is better than morning application and in general liquid form is less harmful to bees compared to the powder form. More information and a list of chemicals with their toxicity to bees is available at http://www.beelab.osu.edu/factsheets/sheets/2161.html

Although it is a little outdated (first printed in 1976), the book "Insect Pollination of Cultivated Crop Plants" covers nearly all crops (fruits and vegetables) and is the best reference available for pollination to-date. It has been out of the print for many years, but the book is available free online at: http://gears.tucson.ars.ag.gov/book/. Other websites provide specific information on honeybees, native bees and pollination.

Apple Scab Fungicide Strategies for 2006 by David Rosenberger, Plant Pathology, Higland (Source: SCAFFOLDS Fruit Journal, Geneva, NY Volume 15, No. 3)

Most apple growers who successfully controlled apple scab in 2005 can plan to use the same programs in 2006. There have been no major changes in registrations, and no new fungicides have been registered for scab control in the past year. The remainder of this article provides a quick review of strategies and fungicide options for early season apple disease control.

As noted last year, orchards where the SI fungicides are no longer effective against apple scab must be managed using more conservative prebloom spray programs than might otherwise be recommended. A conservative approach is needed because we have no fungicides that can completely arrest a developing scab epidemic in SI-resistant orchards. If scab gets started before bloom in SI-resistant orchards, the remainder of the season can turn into a scab-control nightmare should seasonal weather patterns favor scab development.

To ensure that no primary scab will become established, the scab control program in SI-resistant orchards should include all of the following:

o The first fungicide must be applied BEFORE the first scab infection period after budbreak. (A copper spray can count as the first fungicide.) Getting that first spray applied before the first infection period is essential even for SI-resistant orchards that were "scab-free" last year.

o Any time during the prebloom period when rains are predicted and the adequacy of fungicide residues from earlier sprays is questionable, fungicide coverage should be renewed AHEAD of the rains.

o Mancozeb at 3 lb/A applied at roughly 7-day intervals will usually provide good scab control in a clean orchard, but in SI-resistant orchards the rate/A for mancozeb should be increased to 4.5-6 lb/A during the critical period between tight cluster and petal fall. Or combinations of mancozeb at 3 lb/A plus 1.5-3 lb/A of Captan 50W (or an equivalent

amount of another captan formulation) can be used. Or Sovran or Flint can substituted for the higher rates of contact fungicides in one or more sprays after tight cluster.

o If heavy rains remove fungicide residues and wet weather is expected to continue unabated for several more days, it may be necessary to apply mancozeb or captan in the rain to prevent infections from becoming established.

Following are general observations on usefulness of the common scab fungicides:

1 - Mancozeb fungicides at 3 lb/A are probably still the cheapest option for prebloom scab control, but they must be applied at 5-7 day intervals during rainy weather rather than at 10-day intervals as was common with SI+mancozeb combinations.

2 - If one compares 3 lb/A of Captan 50W (or the equivalent of another formulation) with 3 lb/A of mancozeb, captan will almost always provide better scab control than mancozeb. Captan usage is limited, however, by captan's higher pricing, its incompatibility with oil sprays, and its lack of activity against rust diseases. Where incompatibility with oil is not a factor, combinations of mancozeb and captan provide the "best of both worlds" in prebloom scab sprays.

3 - Dodine may still work in some orchards, but don't trust it unless you've had leaf samples tested for fungicide resistance. I've seen too many crop failures that resulted from just one or two early season applications of dodine in dodine-resistant orchards.

4 - Vangard and Scala fungicides usually provide scab control similar to that provided by mancozeb at 3 lb/A. However, Vangard and Scala can both provide 48-60 hr of post-infection activity against apple scab (counting from the start of the wetting period), whereas mancozeb sprays will provide only 18-36 hr of "kickback" activity when counting from the start of wetting periods, with the longer duration limited to colder infection periods. Vangard and Scala do not redistribute well, so combinations of mancozeb at 3 lb/A plus either 3 oz/A of Vangard or 5 fl oz/A of Scala are recommended when these products are used. A 2005 trial in the Hudson Valley verified that Vangard and Scala used at these rates will still provide at least 56 hr of postinfection activity.

5 - Flint and Sovran are good protectant fungicides that provide better scab control than mancozeb or captan used alone. They can also arrest spore production if visible scab lesions are present in trees. However, they will not stop epidemics as effectively as SI fungicides did in SI-sensitive orchards if they are applied after scab infections are established.

6 - Most NY apple orchards should still be receiving an SI fungicide in combination with either captan or mancozeb at petal fall and first cover. SI's applied at that timing will provide significant suppression of powdery mildew as well as postinfection activity against any scab and rust infections that may have slipped through during the prebloom and bloom sprays. Using SI's in two applications after bloom should minimize selection pressures for SI-resistant scab while still maximizing the benefits that SI's provide for apple disease management programs.

Growing Degree Days Across Ohio - Data through April3 from OSU Phenology Garden Network (not all locations) [OSU Phenology Garden Network]

OSU South Centers Piketon	297
Athens	273
Chillicothe	269
Marietta	263
Wilmington	235
Washington Court House	224
Columbus	218
Newark	211
Delaware	207
Xenia	205
Mt. Sterling	202
Coshocton	198
Wooster	180
Mansfield	179
Canton	177
Findlay	160
Canfield	158
Toledo	155
Norwalk, Stow	154
Shinrock	148
Cortland	139
Willoughby	136
Kingsville	121

Coming Events -Art Agnello SCAFFOLDS Fruit Journal, Geneva, NY Volume 15, No. 5

COMING EVENTS	43F	50F
Coming Events:	Ranges (Normal +/- Std Dev):	
Comstock mealybug 1st gen crawlers in pear buds	215-441	80-254
European red mite egg hatch	231-337	100-168
Green apple aphids present	111-265	38-134
Obliquebanded leafroller larvae active	158-314	64-160
Oriental fruit moth 1st catch	204-384	81-205
Pear psylla 1st egg hatch	174-328	60-166
Redbanded leafroller 1st flight peak	232-380	104-192
Rose leafhopper on multiflora rose - 1st nymph	239-397	96-198
Rosy apple aphid nymphs present	134-244	56-116
Spotted tentiform leafminer 1st catch	112-236	39-113
Spotted tentiform leafminer 1st oviposition	143-273	58-130
McIntosh at half-inch green	153-197	65-91
McIntosh at tight cluster	196-254	84-122

Fruit Observations and Trap Reports

Site: Waterman Lab Apple Orchard, Columbus
Dr. Celeste Welty, OSU Extension Entomologist
Dates: 3/29 (silver tip) to 4/5/06 (green tip)
Pests: Redbanded leafroller: 1
Spotted tentiform leafminer: 1

Site: Waterman Lab Apple Orchards, Columbus
Dates: 4/5 (green tip) to 4/12/06 (half-inch green)
Pests: Redbanded leafroller: 13 (up from 1 last week)
Spotted tentiform leafminer: 6 (up from 1 last week)

Site: Holmes, Medina, and Wayne Counties
Ron Becker, IPM Program Assistant
Dates: As of 4/13, most apples are at half inch green. Peaches are now at pink and should start blooming in the next day or so. Fungicides are being applied.

Pests:

Wayne County:
Spotted tentiform leafminer - 750
Redbanded leafroller - 33

Holmes:
Spotted tentiform leafminer - 462
Redbanded leafroller - 37

Medina:
Spotted tentiform leafminer - 350
Redbanded leafroller - 22

Ohio Poison Control Number

(800) 222-1222
TDD # is (614) 228-2272