

PLANT & PEST ADVISORY

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Save The Bees

Peter W. Shearer, Ph.D., Tree Fruit Entomology



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Honey bees are important players in production agriculture because of their role in pollinating crops. Pollination is the process where pollen is transferred from the anthers (male flower parts) to the stigma (female flower parts). Some plants are self-fertile and do not require an external agent such as wind or insects to perform this process. Other plants may be self-infertile, thus requiring active transfer of pollen from one flower to another. When environmental conditions are favorable, pollen, transferred to the stigma, germinates and sends a pollen tube bearing the tube nucleus and sperm nuclei down through the style into the ovary and finally to the ovule. Fertilization occurs when the sperm nuclei fuses with the female egg nucleus. This fusion results in a fertilized egg and leads the development of a viable seed.

It has been estimated that approximately one-third of our total diet is based upon insect-pollinated plants. Given the importance of bees in agriculture, they must be protected from accidental poisoning from pesticides. Most bee poisoning occurs when the bees are foraging flowers to collect pollen and nectar. Foraging bees can be hit directly by a spray or pick it up as a residue on the plant surface or in contaminated water. In some cases, the insecticide is fast-acting and results in the death of the bee before it can return to the hive. In other instances the poison can be brought back to the hive as contaminated nectar, pollen, or water. This can result in severe poisoning if fed to the developing brood and sometimes causes complete destruction or weakening of the colony.

Some insecticides are toxic to bees and certain precautions must be made during application when indicated on the label. One insecticide, PennCap-M, can be toxic to bees if applications are not made in accordance to the label. This product is a flowable formulation consisting of water suspension of polymeric-type microcapsules which contain methyl parathion. Bees can pick up this material when foraging flowers and bring it back to the hive. Bees are then killed when they ingest contaminated pollen. In order to avoid this problem, restrictions on the PennCap-M label read, "Do not make initial application before total petal fall. Do not apply when weeds or cover crops in orchards are in bloom and bees are foraging in the areas to be treated. Applications should not be made during non-foraging hours (including nighttime) when bees have been observed during normal foraging hours that day". In addition, the Rutgers University 1996 Commercial Tree Fruit Insecticide / Fungicide Recommendations contains a statement indicating that no insecticide should be used during bloom.

PennCap-M is a material that fits well in the Rutgers Apple and Peach IPM programs. It provides excellent control of many tree fruit pests and is rated only slightly toxic to the mite predators found in regional orchards. Use it properly. Make sure you read and follow the label when applying PennCap-M and all other pesticides. □

Phytophthora Root and Crown Rot: Orchard Site Considerations

Norman Lalancette, Ph.D., Tree Fruit Pathology

There's no doubt about it: poor orchard site conditions have a definite impact on the likelihood of infection by *Phytophthora* species. A soil that is high in clay content is not likely to drain well; nor is one that contains a subsurface layer of clay. Also, topography can influence the ultimate amount of water in the soil. A greater amount of runoff will occur on sloped surfaces, while low areas will tend to collect water. And soggy soil is exactly what *Phytophthora* spores need for infection.

But what about marginal sites? Extended wet weather, as we have been experiencing recently, can turn a normally "good" orchard site into one that is marginal. After planting, several years of normal or dry weather can result in a healthy, vigorous orchard. Everything seems to be progressing smoothly, but then the rains begin and never seem to end. The previously good site becomes, albeit temporarily, one that is marginal or even bad!

◆ Criteria for Infection

At least ten different species of the plant pathogenic fungus *Phytophthora* have been implicated as causal agents of **root** and **crown rots** on tree fruit. Many of these species are ubiquitous, occurring and surviving in most soils wherever tree fruit are grown. Thus, it is unlikely that an orchard will escape infection due to lack of inoculum.

Rootstock susceptibility is another factor of importance. Based on field observations and greenhouse studies, infection and subsequent stone fruit tree loss is greater on Lovell peach than on Nemaguard. On apple, M.9 is considered the most resistant, while MM.106 and MM.104 are very susceptible; other rootstocks tend to fall somewhere in the middle in terms of susceptibility, although rankings are complicated by differences in virulence among the *Phytophthora* species.

Continuous wet weather is the single most important factor that can turn a good site into one that is marginal. But the occurrence of disease and its extent is also dependent on the species of *Phytophthora* present. For example, controlled greenhouse experiments have shown that *P. megasperma* caused significant **root** and **crown rot** on Lovell peach when the soil was saturated for a duration of 48 hours, but very little disease was observed with 24 or fewer hours of saturation. In contrast, *P. cinnamomi* caused significant **rot** with only short durations of soil saturation and even in the absence of saturation! Thus, an orchard that may appear to be well drained under typical conditions, could become infected in the presence of the "right" pathogen species and extended wet weather.

◆ Integrated Management

Although site selection is critical, it is not always practical or even possible to plant an entire orchard that is "ideal." Variations in soil types and undulations in the topography across an orchard will inevitably result in pockets prone to disease development. Furthermore, it is not always possible to allow a site to remain fallow for several years before replanting. Even if this was possible, *Phytophthora* produces resistant oospores and chlamydospores that can persist for years in the soil.

Given the above site limitations, successful management of root and crown rot requires an integrated approach employing cultural practices, available rootstock resistance, and the use of chemical treatments. Installation of drainage conduits and surface leveling can help improve water drainage. Trees can be planted on raised berms to promote movement of water away from the trunks. Irrigation sprinklers or emitters should be located to avoid accumulation of water near the crowns.

Compared to cultural practices and use of resistant rootstocks, chemical control is relatively expensive. However, fungicides need not be applied to an entire orchard; and if this were the case, then improper site selection is at fault. In most situations, only those areas of the orchard prone to moisture accumulation need be treated. This approach will save both time and money.

Applications of materials labeled for chemical control, such as fosetyl-Al (Aliette) and metalaxyl (Ridomil), should be done on a preventative schedule since damage often occurs before symptoms become visible. Usually, the spring and fall are the wettest periods of the season and applications should be performed at these times. However, if prolonged soil wetting occurs during the Summer, then treatment should be considered at this time as well. And as always, materials should be used according to label specifications. □

Frost Hits N. Jersey

Winfred P. Cowgill, Jr., Hunterdon County Agricultural Agent and William H. Tietjen, Warren County Agricultural Agent

This week a cold snap caused wide spread frost across the state. Some frost injury occurred in selected sites. Several strawberry growers in Northern Hunterdon county received cold injury to the primary flowers. Most tree fruit crops appear OK in Northern New Jersey but a detailed assessment is needed over the next several weeks. The cold and frost injury were site specific.

Temperatures growers reported are as follows: Old Bridge high 20's, Hackettstown 27°F, Rutgers Snyder Farm 35°F.

Keith Arnesen, Rutgers Extension Staff Meteorologist reported the following low temperatures: new record lows in New Brunswick 32°F and Allentown, PA 29°F. Belvidere 30°F, Phillipsburg 34°F, Newton 29°F, Flemington 29°F, Princeton 29°F, Teterboro 32°F. □

Scab Resistant Apples

Jerome L. Frecon, Gloucester County Agricultural Agent

Dr. David Rosenberger of Cornell University's Hudson Valley Laboratory recently published "A Summary of Five Years of Field Research with Scab Resistant Apple Cultivars" in Volume 6, Number 2 of the SARE Apple Newsletter. Copies of this newsletter can be obtained by contacting Dean Polk at (609) 758-7311. Dr. Rosenberger gleaned the following conclusions and observations from a five state project organized in 1988 called the Northeast SARE Apple Project, in which a number of us in New Jersey participated.

- New cultivars such as Liberty are not attractive for apple growers who market fruit through brokers. Some growers have learned the hard way that reduced pesticide costs are meaningless if the final product is not marketable;
- All new cultivars, whether scab susceptible or scab resistant, face formidable hurdles in gaining market acceptance unless these cultivars are promoted by the Washington State or New Zealand Marketing Associations;
- None of the scab-resistant cultivars or selections that we have evaluated are clear-cut winners in the category of Empire or Ginger Gold;
- The perfect fresh-market scab resistant cultivar has yet to be discovered;
- Those scab resistant cultivars with resistance to scab, mildew, and cedar apple rust will require less fungicides than conventional cultivars, but they will still need protection from quince rust, black rot, bitter rot, sooty blotch, and fly speck. The number of sprays required will depend on the region in which the cultivars are grown and on the proximity to other sources of inoculum;
- The amount of fungicides needed to produce extra fancy fruit with scab resistant cultivars will vary depending on both geographic location and proximity of the plantings to inoculum sources;
- Fungicides have an adverse impact on mite predators;
- Within the last three years breeders and processors have begun screening advanced selections of scab resistant cultivars for their potential as processing apples;
- Scab resistant cultivars that are currently available should be promoted for home garden use and for niche market sales.

The following are the scab resistant cultivars Dr. Rosenberger lists in the article: Prima, Priscilla, Sir Prize, Jonafree, Redfree, Dayton, William's Pride, GoldRush, Enterprize, Pristine, Nova Easy Gro, Macfree, Novamac, Novaspy, Liberty, Freedom, NY73334-35, NY75414-1. □

Pruning Apple Trees at Planting on Dwarfing Rootstocks

Ron Perry, Ph.D., Michigan State Tree Fruit Extension Specialist

(Reprinted from the MSU Crop Alert Newsletter Fruit Edition, 11(3):3)

Pruning apple trees on dwarfing rootstocks, such as M.9, Mark, and M.26, can make a huge difference in their development in the formative years. Trees coming from the nursery come in all sizes, shapes, and conditions. Many or all will possess branches known in the apple industry as "feathers" that are the same age as the central stem (leader) and are a minimum length of 10 inches. Growers should treat trees as "whips" if the trees have less than 3 feathers. To do this, remove branches at the stem if they arise from below the 22-24 inch height (above the soil line). Cut feathers and other branches that arise from above this height back to 2-4 inch stubs.

Preferably, make that cut a "Dutch" or bevel cut. Making a cut in this fashion encourages growth to arise from the underside of the branch and typically develop in a wide angle with respect to the leader.

Should the tree have 3 or more feathers arising from the 22-24" height, treat in the following manner. Keep the feathers (except remove broken ones), spread where necessary, and prune (tipping or heading cut) growth off the feather that extends beyond the 24" length.

Except for the Super Slender Spindle and Solaxe, make a heading cut on the upper most part of the leader or central stem for most training systems at a distance of 6-10 inches above the upper most feather. Remember not to include branches less than 10" in length as feathers. I find that it is best to remove any competing branches shorter than 10 inches that arise in the upper portion of the leader (near the heading cut). The shorter branch interval, such as 6", should be used for trees where growth is expected to be.

For trees that are "whipped", cut the leader at a customary 30-36" height, depending on the size of the tree and/or preference of the grower (shorter heights for weak, thin calipered trees). Monitor early season growth on feathered trees. Should they appear to have a slow start, growers are advised to go back in early June and cut an uppermost competing, strong feather off. □

California: NJ's Competition

Jerome L. Frecon, Gloucester County Agricultural Agent

The California peach and nectarine industry is the major competition for the New Jersey Wholesale Peach Industry. Consider the following information in the May 6, 1996 California Summer Fruit insert in The Packer newspaper."

- Most shippers anticipate a healthy crop of peaches, nectarines, and midseason plums this season.
- California shipped 14.8 million packages of peaches in 1995 down from 19.4 million cartons in 1994.
- Nectarine shipments accounted for 13.9 million packages in 1995 down from 19.5 million packages in 1994.
- They planned to begin harvesting the fruit in late April and early May.
- Prices for California peaches are expected to be strong this season, because industry leaders in Georgia estimate their production will drop 75% to 80% because of freeze damage, and a 30 to 50% drop in South Carolina. California does not expect a record crop either because the peaches received fewer chilling hours than normal. The state recorded 610 to 615 cold hours this season. The crop depending on variety, generally requires 800 to 1000 hours. Yet California shippers expect an average crop.
- Because of damage in the Southeast, which last year accounted for 35% of the peach crop from May through July, several California shippers said they may market more heavily to the East Coast this season. California growers are expecting to market more domestic supplies of the white fleshed peaches and nectarines this year with significantly increased volume of the specialty fruit expected in the next two to five years.
- About 194,000 boxes of white fleshed nectarines and 585,000 boxes of white fleshed peaches were produced last season with more than 50% of these going to exports.
- White fleshed fruit will drop dramatically the next 5 years because of increased volume. Lowering the price of specialty peaches may entice more retailers to try it.
- Shippers throughout the San Joaquin Valley reported that white fleshed peaches and nectarines are sub-acid or a low acid product that enhances the sweetness of the fruit.
- It could be a good year for bagged fruit. Retailers have an opportunity to move mass quantities of fruit in bags. Bags offer shrink protection, easy price scans at the register and a way to ripen fruit and keep it moist.
- Retailers are asking for an 80 to 90% stick on rate for PLU Stickers. The sticker stay on rate is more like 30 to 40%. One option is to get the FDA to pass approval for a stronger glue for the PLU codes. PLU

stickers are here to stay.

- California peach and nectarine shippers will ship fruit under a utility grade for the first time this year in domestic markets only."
- The industry will begin packing peaches, plums and nectarines in a shoe box container and a metric unitized module box on a large scale as part of the industry's move to ship fruit on standard 48" by 40" pallets. The shoe box is 12" wide 20" long and 5 inches deep. It can be packed as a 25 pound volume fill, and the box can be adapted with new trays inside that will offer buyers the same count packs as an L.A. Lug.
- Many growers will continue to offer tree ripe packs of fruit. Research has show that peaches and nectarines travel better and show less bruising at 8-10 pounds than at 12-14 pounds pressure." □

New Publication on Apple Thinning

Winfred P. Cowgill, Jr., Hunterdon County Agricultural Agent

I have just reviewed an outstanding new publication from my colleague at Michigan State University, Phil Schwallier, district Horticulture and Marketing Agent. Phil is an outstanding pomologist working in the "Ridge" area of Michigan that produces over 40% of Michigan's apples. He has compiled a comprehensive manual for apple chemical thinning directed at growers. It is the first new manual in at least twenty years.

In my opinion every apple grower should obtain a copy of this manual for reference. It will give you a better understanding of the physiology of flowering and fruit set and help you do a better job in your orchards.

The Apple Thinning Manual is available from The Great Lakes Publishing Company, P.O. Box 128, Sparta, Michigan 49345. Cost is \$10 plus \$1.50 for postage and handling for each book. For more information call (616) 887-9008.

The following was reprinted from an article in the Great Lakes Fruit Grower News, Volume 35, Number 4, Page 5, regarding the new manual.

"Thinning is a very complicated and confusing necessary practice that growers are always unsure of," said Mr. Schwallier. "Much of the confusion is over all the factors that influence fruit set and thinning. I've tried to condense the thought process into steps that need to be considered before, during and after thinning." The recent release of some new thinning materials including Sevin XLR and Accel have further confused the issue. Mr. Schwallier reviews how these materials and the older materials help growers understand the thinning

SEE THINNING MANUAL ON PAGE 5

response when used alone or in tandem.

"Understanding what thinning materials are available and how they work will help growers make decisions on which ones to use and when to use them," Mr. Schwallier said. "Knowing the responses that can be expected from different varieties will greatly increase the success of thinning."

The in-depth book looks at the factors that involve fruit set and thinning, and reviews variety sensitivity. "The current thinking is to thin earlier and more aggressively starting at petal fall," Mr. Schwallier said. "The manual encourages growers to thin earlier for successful thinning and return bloom and aggressively for larger fruit size." To make the subject easier to understand there are many colorful graphics, tables, charts and check off lists. Sections of the book include an introduction, thinning windows, thinning factors, weather factors, apple thinning rates and timing, and thinning materials. The tables cover thinning and fruit set factors, and varieties and thinning rates. The charts include fruit set and thinning planner, the fruit set evaluation checkoff and a final pre-spray checkoff. The fruit set and thinning planner combine the factors that influence fruit set and response to thinning, including predicted set, bloom factors, weather conditions, pollination factors, grower management factors and tree and orchard factors. The final pre-spray checkoff is designed to be used by growers just before making any thinning applications and considers weather conditions for the next five days, predicts thinning response and makes recommendations on the thinning action.

"This is something all apple growers will find useful during this important decision time," Mr. Schwallier said. "This manual will help growers thin aggressively and early to provide the best success of annual fruit production and fruit quality." □

Vydate L Receives Apple Thinning Label in NJ

Winfred P. Cowgill, Jr., Hunterdon County Agricultural Agent

Good News. We were informed this morning by Tom Korzorski, of NJ DEP, that we have been granted Special Local Need 24(c) Labeling for Vydate L Insecticide/Nematicide for Apple Thinning for the State of New Jersey.

Vydate L is a DuPont product that adds another tool in our apple chemical thinning toolbox. Growers must have a Vydate L 24(c) label in their possession to use Vydate in NJ for apple thinning. A copy may be obtained from the Gloucester or Hunterdon Cooperative Extension offices or From FaxInfoLine (908-932-6767) as Document 3037.

TWILIGHT FRUIT MEETING ZEE ORCHARDS MULLICA HILL ROAD, ROUTE 322 GLASSBORO, N.J. May 22, 1996, 6:30 P.M.

Sponsored by Rutgers Cooperative Extension for Atlantic, Camden, Cumberland, Gloucester and Salem County Fruit Growers and Allied Industry.

A tour will be taken of part of the 465 acres of apple and peach tree plantings. Of particular interest will be raised bed plantings made with a mulch laying machine; Royal Gala apple on MM111; Bellaire peaches with unique soil aeration treatments to invigorate trees; young plantings of Easternglo, Summer Beaut, Sunglo and Redgold nectarines, Lauro peach plantings with Warwick Hard Fescue; varieties of young plantings of Fruit Acres 12 and 13 on Bailey rootstock; a test of 5 treatments of Apollo and Savey on Redchief Red Delicious.

Demonstrations will be given on a Tree Sense Laser Spray Controller and Smart Spray Sonar Units on Ag Tec 603 and Durand- Wayland Sprayers.

The following Rutgers Cooperative Extension personnel will also be available to discuss pest management, pesticide safety, and tree management practices on this 2 1/4 hour tour. They are:

- Dr. Norman Lalancette, Specialist in Tree Fruit Pathology
- Dr. Peter Shearer, Specialist in Tree Fruit Entomology
- Dr. Robert Belding, Specialist in Pomology
- Dr. Brad Majek, Specialist in Weed Science
- Dr. George Hamilton, Specialist in Pesticides
- Mr. Dean Polk - IPM Agent - Fruit
- Mr. Dave Schmitt- Program Associate - IPM Fruit
- Mr. Gene Rizio - Program Associate - IPM Fruit
- Mr. Jerry Frecon - Agricultural Agent

The orchard is not fully accessible to the physically handicapped. Special arrangements can be made by contacting J. L. Frecon at (609) 863-0110.

New Jersey Pesticide Applicator Recertification Units will be given.

Our work in NJ in 1995 indicated that Vydate L works best in combination with other thinning materials. It is labeled for 1- 2 applications from petal fall/ 3mm to 20mm king fruit diameter.

For information on timing, rates and combination with other thinners consult the label. Contact Win Cowgill, Hunterdon County Agricultural Agent at (908) 788-1338 for information on 1995 NJ thinning trial results and for additional information on the use of Vydate L as an apple thinner in NJ. □

Fruit IPM

Week Ending 5/17/96

Dean Polk, IPM Agent - Fruit

◆ Apple

Spotted tentiform leafminer (STLM): All larvae are still in the sap feeding stage. Very little activity is present on most farms, with only a small percentage of blocks having mine levels which can be counted. Growers wishing to apply systemic materials for control of this pest still have time to do so. See last newsletter for recommendations.

Tufted apple budmoth (TABM): Adults have been caught in southern counties for about a week. First trap captures were seen in Mercer County on 5/13. Insecticide treatments should cover the oviposition and hatching periods for each of the 2 generations. Use at least 100 gal of spray volume per acre on mature M7 size trees or larger. Guthion and Imidan do not work well against this pest in problem areas. Penncap and Lorsban 50W improve control, while the inclusion of Lannate improves control even more. The synthetic pyrethroid, Asana also works well, but builds mite populations since it is extremely toxic to all mite predators. In most of the southwestern portion of the state where TABM is the worst, Lorsban @ 1.5 lb/A + Penncap @ 1-2 pt/A usually gives satisfactory control for the first brood, provided that adequate spray volumes are used. Lannate is not recommended for the first brood unless insect pressure is extremely heavy. Lannate is recommended for the second brood. Four alternate middle sprays should be used for each brood, and timed for the Penn State degree day driven model. These timings are as follows: First brood treatments should be applied at 490, 625, 763, and 898 °D₄₅ (base 45) after first adult catch. °D accumulations have started and are reported in the degree day box below.

White apple leafhopper (WALH): There have been a few discussions over the past week regarding leafhopper treatments and fire blight transmission. While leafhoppers are a suspected vector of fire blight, recent research indicates that *WALH is probably not one of the species that spreads the disease*. There are 3 species of leafhoppers that may be commonly found in apple plantings in New Jersey. These are white apple leafhopper (WALH), potato leafhopper (PLH), and rose leafhopper (RLH). PLH adults usually make their first appearance in June, while RLH adults find their way into apple orchards in July. Growers should stay with the early season treatment threshold of 3 leafhopper nymphs per leaf during the month of May.

Codling moth (CM): The first consistent adult trap captures have been seen in most southern and central counties. Insecticide treatments are suggested after an accumulation of 250 °D₅₀ (base 50) since biofix or first trap catch, and again about 2 weeks later. See degree day chart below for a summary of codling moth and other modeled insect activity.

European red mite (ERM): Motile forms are present at low levels, but in some areas at up to 15 - 20 mites per leaf. Some of the blocks where mites are present have been treated with Apollo or Savey. It is not unusual for some hatch to occur after Apollo or Savey treatment, but most nymphs will soon disappear. *Stethorus punctum* adults are visible in a few areas as they come up from their overwintering sites and search for mites. The next 6 to 8 weeks is a critical time to let predators

build up, and not harm populations by using highly toxic materials such as pyrethroids or Lannate.

Apple scab: Scab lesions are easy to find. Where present, foliar levels are less than 1%, but approached 10% on 1 farm. Extra applications of fungicide should be made when rain completely weathers off previous applications. This may mean more than 1 application per week if only protective materials are used. This is probably the year when repeated applications of SI combinations (Nova, Rubigan, or Procure + an EBDC, Captan) will pay for themselves. Additional scab infection periods in southern counties occurred on 5/5-7.

Fire blight: The first fire blight strikes were seen this past week in a block of Opalescent apples near Richwood, Gloucester County. Given the number of infection periods we have had, more symptoms are sure to show up. Copper or alternating copper with streptomycin sprays is usually sufficient for infection periods that occur after bloom. This includes infections which start from leaf blight, shoot blight, fruit, limb, or collar blight. Just because bloom is over *does not mean* that we can no longer get additional fire blight infections.

◆ Peach

Oriental fruit moth (OFM): First sprays are/were due in Hunterdon County on May 9 -10, and in Morris County on about May 14 - 15. The second of 2 applications is due in southern counties on about May 18, but around May 14 in Hamonton.

Cattfacing insects: Very little activity is present.

Green peach aphid (GPA): Colonies have increased slightly. One nectarine planting was seen with just over 1 colony per tree. GPA should not be tolerated in nectarines. If 1 or more colonies per tree is present, then treatment is suggested. Lannate is the material of choice at this time of year. If 1.5 to 2 pt/A of Lannate is used, then reduce OP use by 50%.

Lesser peachtree borer (LPTB): The first LPTB adults were caught in pheromone traps this past week. There are 2 generations per year, with the first adult flight occurring from now through early July. A second flight occurs from mid July through the beginning of September. Oviposition and hatch occur on Cytospora cankers, after which larvae may be found mining just underneath and on the edge the Cytospora wound tissue. Treatment is suggested for both generations only if using a handgun with a dilute spray. If you are unable to treat with a handgun for the first generation in June, and wish to use an airblast sprayer instead, then you are better off just skipping the treatment. Concentrate on treating the second generation with a handgun instead.

Brown rot: In most areas sulfur alone at 10 to 12 lb/A is recommended for brown rot control at this time of year. Exceptions occur if blossom blight is present. See last newsletter.

Peach scab: Scab lesions on last year's wood are now sporulating. Any block that had scab last year will have sufficient inoculum to cause infections this year. Benlate @ 8 oz/A plus Captan @ 2 lb/A provides the best control in problem blocks, providing there is no resistance to Benlate.

◆ Pear

Pear psylla: Nymphs of various stages are present. Most nymphs are the older hardshell stage. There are 3 generations per season of this pest. The nymphs which are present now hatched from eggs that were laid during the bud break period. Most nymphs can be found at the base of the leaf petiole. During warmer weather more may be found on the leaf blade. Psylla populations should be treated if there are more than .2

to .3 nymphs per leaf, or if at least 5% of the terminals or fruit spurs are infested. Materials that are available for control include Agri-mek @ 20 oz/A + 1 gal/A of spray oil (applied during the first six weeks after petal fall - this treatment also controls mites), Mitac @ 2 to 3 lb/A (will suppress mites), and M-Pede applied at a 2% solution or 2 gal per 100 gal of spray volume. Synthetic pyrethroids are not suggested this time of year. Agri-mek while very effective is also costly.

◆ **Blueberry**

Cranberry fruitworm (CBFW): Pheromone traps were placed in both cultivated and wild/abandoned sites this past week. No adults were found to have emerged as of Monday 5/13. Adults are small brown-gray and have 2 white patches on each front wing. They are night fliers and do not travel great distances. Larvae overwinter in a hibernacula just below the soil surface, pupate in the spring and emerge as adults around early to mid May. Emergence should start by next week.

However, the cooler weather we have been having has retarded pest development in other crops for as much as 2 weeks. Therefor CBFW may also be delayed. The bulk of oviposition occurs over several weeks after adult emergence. Single eggs are laid on the calyx ends of berries and hatch in slightly less than a week, depending on the temperature. Larvae often crawl up the side of the fruit and enter the fruit near the stem end. Larvae may move from berry to berry as they mature, creating frass and webbing between the fruit. Larvae are light yellow-green with a brown-green to amber head. Organophosphates applied after the petals fall usually target this pest. However, growers should wait until moths are caught and egg laying begins before initiating sprays for CBFW.

Redbanded leafroller (RBLR), Obliquebanded leafroller (OBLR), and Green fruitworm (GFW): Leafroller and fruitworm larvae are present at low levels in sampled fields. In Burlington County 2 samples out of 24 (8%) had populations above treatment levels. In Atlantic County 0 samples out of 30 were above threshold. Young, half grown green fruitworm larvae are the most common "worm" being found. There are several species of green fruitworms. The most common species are the speckled green fruitworm and the humped green fruitworm. The latter can be recognized by the presence of several white lateral lines and a dorsal hump at the rear of the body. Most of what we are seeing are humped green fruit-

worms. These overwinter as eggs, hatch when the first green tissue shows, and feed for up to 2 months before pupating. There is usually only 1 generation per year.

Other insects - Sawflies & Aphids: Sawfly larvae are present in scattered locations in Atlantic County. Scouted populations are not significant and do not constitute a pest problem. The first aphids were seen on 5/2, with a few more scouted this past week. All levels are extremely low at this time.

Mummy berry and other diseases: The shoot blight phase of mummy berry was seen in Atlantic County. Strikes were easily found in 1 planting in particular. Blueberry scorch virus symptoms are present in several locations in the Pemberton, Burlington County area.

◆ **Insect Trap Captures**

Week Ending	4/5	4/12	4/19	4/26	5/3	5/10
Tree Fruit - Southern Counties						
RBLR	1.1	1.9	16.3	47.9	43.0	13.7
STLM	20.4	48.1	1236	1282	1215	1334
TABM-A	—	—	0.0	0.0	8.4	5.9
CM	—	—	0.0	0.0	0.0	0.4
AM	—	—	—	—	—	—
OFM	0.1	.03	0.5	20.7	29.0	21.4
TABM-P	—	—	0.0	0.0	0.32	2.2
LPTB	—	—	—	0.0	0.05	1.8
PTB	—	—	—	—	—	—
Tree Fruit - Northern Counties						
RBLR	—	22.0	41.5	63.6	34.6	0.21
STLM	—	7.0	355	506	417	450
TABM-A	—	—	0.0	0.06	0.1	0.03
CM	—	—	—	0.0	0.2	0.21
AM	—	—	—	—	—	—
OFM	—	0.0	2.5	1.3	14	11
TABM-P	—	—	0.0	0.02	0.0	0.0
LPTB	—	—	0.0	0.0	0.0	0.0
PTB	—	—	—	—	0.0	—
Blueberry - Atlantic County						
RBLR	—	14.4	51	106	79.2	24
OBLR	—	—	—	—	—	.02
CBFW	—	—	—	—	—	0
SNLH	—	—	—	—	—	—
BBM	—	—	—	—	—	—
Burlington County						
RBLR	—	3.8	8.8	51	23.9	14.7
OBLR	—	—	—	—	—	0
CBFW	—	—	—	—	—	0
SNLH	—	—	—	—	—	—
BBM	—	—	—	—	—	—
Abandoned Fields (both counties)						
RBLR	—	1.0	7.0	23.7	23.5	12
OBLR	—	—	—	—	—	0
CBFW	—	—	—	—	—	0
SNLH	—	—	—	—	—	—
BBM	—	—	—	—	—	—

Insect Degree Day Accumulations as of 5/11

Insect	Site & County Biofix Date plus Degree Days Since Biofix
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	Bridgeton Cumb.	Hammonton. Cam.	Hardingville Glou.	Richwood Glou.	Princeton Mercer	Oldwick Hunt.	Morristown Morris
OFM ₄₅	4/20 - 314 hit 200 on 5/2 predict 400 on 5/18	4/5 - 332 (5/8) hit 200 on 4/27 predict 400 on 5/14	4/19 - 328 hit 200 on 5/1 predict 400 on 5/18	4/17 - 332 hit 200 on 5/1 predict 400 on 5/18	4/19 - 302 hit 200 on 5/3 predict 400 on 5/19	4/22 - 236 hit 200 on 5/9 predict 400 on 5/22	4/24 - 182 hit 200 on 5/14 predict 400 on 5/26
TABM ₄₅	5/4 - 101	5/3 - 113	5/2 - 128	5/2 - 128	5/13		
CM ₅₀	5/8 - 33	5/8 - 34	5/8 - 34	5/8 - 34	5/11		

All reported accumulations based on Skybit Inc. data, except Hammonton. OFM base = 45, max = 90, TABM base = 45, max = 91, CM base = 50, max = 88.
 Spray targets based on: OFM: 200 °D after biofix and again 200 °D later (first generation only)
 TABM: (A.M. sprays) 490, 625, 763, 898 - 1st gen. and 2228, 2415, 2605, 2795 °D after biofix - 2nd gen.
 CM: 250 °D after biofix and again 2 - 3 weeks later.

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Pesticide User Responsibility: Use pesticides safely and follow instructions on labels. The user is responsible for the proper use of pesticides, residues on crops, storage and disposal, as well as damages caused by drift. For specific labels, special local-needs label 24(c) registration, or section 18 exemption, contact Rutgers Cooperative Extension of your County.

Use of Trade Names: Trade names are used in this publication with the understanding that no discrimination is intended and no endorsement is implied. In some instances the compound may be sold under different trade names, which may vary as to label clearances.