RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

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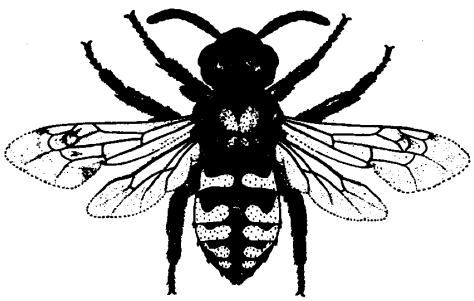

INSIDE

Penncap-M Use in Tree Fruit

Dean G. Polk - Fruit IPM Agent and Peter W. Shearer, Ph.D., Tree Fruit Entomology

There has been an increasing number of calls in recent weeks regarding the use of Penncap-M in fruit orchards located near vegetable farms. The primary concern expressed during these calls is that Penncap-M use is detrimental to bees brought in to pollinate certain vegetable crops. These concerns are valid if Penncap-M is applied in such a way that is inconsistent with this product's label because Penncap-M can kill bees if not used properly. Bee kills are not tolerable because these insects are important for the livelihood of many farmers and beekeepers in addition to helping make the U.S. the most productive food producing country in the world. In addition, many hives are already in a weakened condition because of a severe winter, wet spring, and widespread infestations of parasitic mites. However, as stated at numerous fruit grower meetings, in the NJ Tree Fruit Insecticide/Fungicide Recommendations, and in several Fruit Edition Plant & Pest Advisory Newsletters (See the May 14, 1996 Fruit P&PA Newsletter), Penncap-M can be used safely and effectively without detrimental effects to pollinizers as long as the user follows the label.

❖ **What it is:** Penncap-M is a flowable formulation of microencapsulated methyl parathion. It is an organophosphorous (OP) insecticide with broad spectrum activity and is registered for use on several fruit and vegetable crops. Guthion (azinphos-methyl), Imidan (phosmet), Lorsban (chlorpyrifos), and Diazinon are other familiar insecticides in this class of OP insecticides.

❖ **OP's and IPM:** A central theme in any Integrated Pest Management (IPM) program is to manage pests while protecting beneficial organisms such as predators, parasitoides, or bees. There are several common predators utilized for biological control in tree fruit production including the small black lady bird beetle mite predator, ***Stethorus punctum***, and several species of predatory mites. Fortunately, these predators have become resistant to many commonly used OP's, especially Penncap, Guthion, Imidan, and Lorsban. Judicious use of these materials will control most orchard pests while permitting the growth of mite predator populations that can reduce pest mite levels. Use of other materials, such as the carbamate insecticides Lannate and Sevin, or the pyrethroids Asana, Ambush, and Pounce, kill mite predators resulting in outbreaks of pest mites.

❖ **Insecticide resistance of tufted apple budmoth:** Penncap-M is

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Penncap from page 1

often used to control **tufted apple budmoth (TABM)**. There are 2 generations of this pest. The first generation is produced in June during the time when mite and mite predators are often increasing. The second generation of **TABM** is produced in August as many mite and mite predator levels are frequently on the decline.

TABM has a long history as an established pest in PA, but became a pest in NJ apple production in the early 1980's. By the mid-1980's, **TABM** was becoming difficult to control with OP insecticides. Research conducted during 1987-89 in PA, NJ, and other mid-Atlantic and Northeastern states indicated that **TABM** showed various degrees of resistance to Guthion. Data from the Rutgers Fruit IPM program has shown that fruit damage often resulted when either Guthion or Imidan were used alone or in combination with each other under high **TABM** pressure. Data from other eastern states and the Rutgers Fruit IPM program has also shown that of the 4 major OP's (Guthion, Imidan, Penncap, Lorsban) used against **TABM**, the use of Penncap and/or Lorsban 50W often resulted in better **TABM** control compared with Guthion or Imidan. Better control can be attained with Lannate or pyrethroids but these materials are not recommended for first generation **TABM** control or whenever mites are an issue because these materials kill mite predators. This means that in order to achieve control while avoiding Lannate or pyrethroid use during the first generation, either Penncap and/or Lorsban 50W should be used. Because these compounds are labeled for use on apples, there is more flexibility here than with peaches where Lorsban 50W is not labeled. If Lannate is used during this period, it should only be used at reduced rates and in combination with an OP. Even this use during June tends to kill mite predators frequently resulting in mite outbreaks. Because mites are generally not a big problem in August as they are in June, options for control of the second generation are more flexible and may include Lannate or even synthetic pyrethroids under extreme pest pressure. However, using materials that kill mite predators can have negative carry-over effects that result in poor biological mite control the following year.

Satisfactory **TABM** control has been seen in most cases where either Penncap and/or Lorsban were used for the first generation, and combinations with Lannate were used for the second generation. Spray volumes during June and especially August should be at least 100 gallons/A in apples (M7 or larger trees) and at least 60 to 70 gallons/A in peaches to assure adequate crop coverage. The first sprays for each generation should be timed for first egg hatch because young larvae are more susceptible than older larvae. **TABM** is not a key pest in all areas of the state. Growers who farm in the southwestern counties or who have had previous **TABM** problems should be the only ones who gear their spray programs specifically for **TABM**.

❖ **TABM resistance management:** Insects have inherent abilities to develop resistance to many of the materials used to control them. As indicated earlier in this article, **TABM** has developed resistance to several insecticides resulting in increased crop damage. As more insecticides become ineffective for controlling crop pests, those remaining materials often become overused resulting in resistance development to these materials. It is a vicious cycle that makes it difficult to produce clean, cost effective crops. Ways to prevent or delay insecticide resistance include judicious use of low rates and rotating sprays with different classes of insecticides or modes of action. However, **TABM** is already resistant to many insecticides and some of the alternative materials, while very effective against this pest, increase production costs because they disrupt biological control of other pests resulting in additional sprays to control these secondary or non-target pest outbreaks. Because of the likelihood of resistance development, fruit growers must refrain from using calendar based sprays and apply control measures based upon sampling and predictive models that time sprays at the most susceptible **TABM** stages. This information is provided to growers participating in the Rutgers Fruit IPM program and is also presented in the weekly Fruit Edition Plant and Pest Advisory Newsletters.

❖ **Economics of TABM Control:** Given the preference in June for either Lorsban 50W or Penncap-M use, one also needs to think of the economics of the pest and its control. On apple, Lorsban 50W used alone is recommended at the 3 lb/A rate and may cost close to $20/A. Penncap used alone (3 pt/A) costs less than half as much (please see June 4 Fruit P&PA newsletter for previous discussion on costs). However, the cost of fruit damage is far greater. Rutgers Fruit IPM data from the past 5 years has shown that levels from 3 to 8 or 9% damage have been common. Some farms had blocks with **TABM** damage ranging from 15 to 25%. Damage at 10% can easily equate to almost a $400/A loss in apples (at 600+ bu/A and $.15/lb). Depending on the price, equivalent damage in peaches could mean a $600 to $700/A loss.

❖ **Other TABM Management Options:** Fruit growers that have experienced **TABM** problems can get a head start on managing this pest by taking advantage of a "weak-link" in the **TABM** life-cycle. **TABM** overwinters as larvae in the ground cover, and research conducted by Penn State has demonstrated that applications of Asana to the ground cover at either the pink stage or petal fall stage can reduce **TABM** population levels. However, the **Stethorus** lady bird beetle also overwinters in the ground cover; but by petal fall, they have mostly emerged and entered the tree canopy. Therefore, monitoring **TABM** and **Stethorus** populations is needed to determine the best timing of an Asana application to the ground cover in the spring.

See Options on page 4

Blueberry Insect Management Update

Sridhar Polavarapu, Ph.D., Entomology and IPM

◆ Diazinon use on Blueberries

In last week's issue of Plant and Pest Advisory (Fruit Edition) it was incorrectly stated that Diazinon products manufactured by Ciba-Geigy Corporation do not support blueberry use any longer. While it is true that at the present time Diazinon products manufactured by Micro Flo or Gowan no longer support blueberry use, D.z.n diazinon AG600 WBC and D.z.n diazinon 50 W manufactured by Ciba are both labeled for use on blueberries. However, as per the new federal label only one application of either of these products is allowed per season on blueberries. However, recently Ciba Corporation approached US EPA to amend the federal label for the use of D.z.n diazinon AG600 WBC on blueberries. On June 21, 1996, EPA approved a supplemental label for the use of D.z.n diazinon AG600 WBC on blueberries. As per the supplemental label, no more than 135 fl.oz of D.z.n diazinon AG600 WBC can be applied per acre per season. A maximum of 27 fl.oz of the product can be applied per acre per application. This allows for a maximum of 5 applications of D.z.n diazinon AG600 WBC per acre per season. The Re-entry Interval (REI) and Pre-harvest Interval (PHI) remain the same at 24 hours and 7 days, respectively. Growers are required to have the supplemental label in their possession at the time of application of this product. Copies of this label will be available at the upcoming twilight meeting at the Rutgers Blueberry and Cranberry Research Center on Thursday, June 27, at 6.30 PM.

◆ Insect Update

✔ **Blueberry maggot (BBM):** Yellow sticky traps have indicated the emergence of adult flies in several commercial fields in Burlington and Atlantic Counties. In the abandoned fields around Browns Mills area (Burlington County) trap counts are increasing. Adult emergence also continues to increase in our emergence cages set over BBM pupae. BBM adults do not begin egg laying for at least one week after emergence.

Overall, the adult catches in most fields do not justify treatments specifically for BBM control at this time. If aphid and leafroller populations do not require insecticide treatments, you may consider delaying insecticide applications for one more week.

✔ **Leafrollers:** Pheromone trap catches of Redbanded leafrollers (RBLR) are very high in some locations in Atlantic County. Moths in this generation will continue to lay eggs for another 2 weeks. Eggs are hatching now and will continue hatching for another 10-14 days. In our experience high trap counts do not necessarily mean high larval numbers in the field. Traps placed close to the edge of the farm may attract moths from nearby abandoned fields or woodlands. Insecticide applications are required if combined larval counts of leafrollers and other caterpillar pests exceed an average of one larva per 100 fruit and leaf clusters. Most locations are well below this threshold at the present time.

✔ **Japanese beetles (JB):** Adult beetles have been seen feeding on leaves and berries this week. The adults are brilliant metallic green with coppery brown wings covering the abdomen. JB adults feed on the upper surface of foliage and consume soft tissues between veins, leaving a lacelike skeleton. JB feeding on fruit results in scarring of the berries. In southern New Jersey, the peak adult activity usually occurs in the second half of July.

Adults live 4-6 weeks and females deposit eggs for most of this period. Eggs are deposited 2-4 inches deep, individually in an earthen cell. Females lay between 40-60 eggs during their life. Eggs hatch in about 2 weeks and larvae require 5-7 weeks to reach the mature, third instar stage. During the entire larval period, most of the grubs feed within the top 4-6 inches of soil surface. As surface soil dries, many may burrow below this level to seek moisture. By late October most larvae are ready to overwinter. Feeding resumes in the second half of March as the soil temperature rises above 50^0F. JB has a 1-year life cycle.

Currently, there are no soil insecticides registered to control the grub stage. Control of the adult stage is the only option currently available to manage JB populations. If beetle infestations are severe, apply Sevin at 5-7 day intervals to achieve good control of adults.

✔ **Sharpnosed leafhoppers (SNLH):** Counts on yellow sticky boards are increasing at several locations, especially in Burlington County. We are very close to the peak adult flight now. If you have not applied an insecticide application in the past week, and if your traps are indicating more than 10 adults per trap per week, you may require an application of Diazinon, Imidan, or Lannate. Roguing of suspected stunt bushes should be undertaken as a priority.

✔ **Aphids:** Aphids are well under control in most fields. A very healthy population of Asian ladybird beetles were seen in most of the fields I have been to in the past week. These beetles are effective predators of many soft bodied insects including aphids. Judicious use of broadspectrum insecticides will allow the establishment of these predatory insects in your fields and thereby reduce the reliance on insecticides for aphid control. ❑

Weed Control

Bradley A. Majek, Ph.D., Weed Science

◆ Fruit

✔ **Strawberry:** Apply Formula 40 seven days before mowing old leaf growth if most of the **broadleaf weeds** are taller than the crop, or tank-mix with the preemergence herbicides and apply immediately after mowing if most **broadleaf weeds** are below the crop canopy. Apply Devrinol, unless the full labeled rate for the year was applied in late fall or early spring, and Sinbar. Irrigate within 2 days if rainfall does not occur after application to make the preemergence herbicides available to the emerging weed seedlings. Delay irrigation for 12 hours if postemergence herbicide(s) are applied to allow time for penetration into the leaves, or weed control failure may result. Use care not to exceed the total recommended rate of any herbicide for an acre in one year. Consult the Commercial Vegetable Production Recommendations for rates and additional information.

◆ Tree Fruit

✔ **Perennial Weed Control:** Established perennial weeds in orchards are easily evident now, when residual weed control programs have controlled the **annuals**. Control of **perennials** can be more difficult and may require special attention. Herbicide applications *must* be made at the right time of year to achieve control of the roots as well as the foliage of **perennial weeds**. Failure to apply herbicides at the right time often causes poor results. Weeds must be "actively growing" to move herbicides that are absorbed by the leaves into the roots. Do *not* treat during periods of heat, drought, or other severe stress that adversely affects growth.

✔ **Virginia Creeper** can be controlled in late June to early July with 2,4-D. Before spraying, remove any **creeper** in the tree and carefully lay it in the row. Complete coverage is necessary for excellent control. Caution, 2,4-D can drift as fine spray particles or as a vapor and harm sensitive vegetable and ornamental crops in adjacent fields. Do *not* apply during periods of high wind to avoid spray drift. Do *not* apply when the temperature *or* the humidity is high and the air is dead calm to reduce the risk of vapor drift. Consult the Commercial Tree Fruit Production Recommendations for rates and additional information

✔ **Canada thistle** can be controlled in June or early July, when in full bloom with Roundup 4SC. Broadcast 3.0-4.0 lb ai/a (3-4 qt/a) or spot treat by spraying to the point of runoff with a 2% solution in a knapsack sprayer. Treat before thistle sets seed and dies back later in July and August.

The most effective time to treat **Canada thistle** with Roundup is to spray fall regrowth in early October when new fall thistle growth is 8-10 inches tall, but before frost. Use the same rates recommended for the early summer treatment.

✔ **Goldenrod and white heath (wild) aster** can be controlled in May or June after spring growth has reached 10-12 inches. Broadcast 2.0-4.0 lb ai/a (2-4 qt/a) or spot treat by spraying to the point of runoff with a 2% solution in a knapsack sprayer. Good coverage of the foliage is necessary for effective control. Adjust spray boom height or use a boom that leans over tall weeds at the proper height for spraying.

✔ **Poison ivy** is more difficult to control than **Virginia Creeper**. The weed must be removed from the tree and kept on the ground prior to treatment. Apply Roundup at 4.0 lb ai/a (1 gal/a) in July or August after the weed has bloomed and has green fruit. **Poison ivy** flowers in late June or early July. Look for flowers and fruits on older mature plants that receive full or partial direct sunlight. Do *not* allow Roundup to contact the foliage or young green bark on new fruit tree shoots. Treatment earlier in the season or after fall colors appear are less effective. ❑

Options from page 2

Mating disruption is another management option for **TABM**. Mating disruption uses high concentrations of synthetic insect pheromones to prevent mating of the target pest. When used successfully, mating disruption reduces insecticide use and overcomes many problems associated with broad-spectrum insecticides including the destruction of natural enemies. However, there are drawbacks associated with this new technology including extremely high costs of the product and its application. In addition, **TABM** is present at a time when other pests need to be controlled which means that insecticides still must be used. The biggest drawback of mating disruption is that it does not provide satisfactory control under moderate to high pest pressure therefore limiting its use in problem orchards.

❖ **Future alternatives:** Work is being conducted at Rutgers University and elsewhere to find new ways to control **TABM** and provide alternatives to Penncap-M use. Some of these efforts should lead to the registration of new materials that are effective against **TABM** and other pests, yet are safe to beneficials and bees. However, it may be some time before these products become registered for use against **TABM**. In the short term, a Section 18 application is being submitted for a new Rohm and Haas material called Confirm (tebufenizide). This material is very effective against **TABM** and other **leafrollers**, although the Section 18 for Confirm has not yet been granted for NJ and cannot be used at this time.

❖ **Closing comments:** Any grower that uses pesticides must follow State and Federal laws in addition to the product label. Improper applications are a punishable offense. When a grower breaks the law, especially with regard to pesticide applications, they endanger their own livelihood as well as the rest of the agricultural community because of fallout from the general public.

Penncap-M cannot be applied during bloom or when weeds or cover crops are blooming 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. If you decide to use Penncap-M, use it properly and be a good neighbor to nearby vegetable growers and beekeepers. ❑

Stop Using Penncap

Jerome L. Frecon, Gloucester County Agricultural Agent

The Gloucester County Board of Agriculture - Board of Directors voted on Monday evening, June 24, 1996 to request all fruit growers stop using Penncap M in their orchards.

Vegetable growers and beekeepers presented their concerns to the Board of Directors on the negative effect of Penncap M on bee survival and the loss of production of "cucurbit" type vegetables. Information was also presented on the benefits of Penncap M in an Integrated Pest Management program and lack of alternatives for tufted apple bud moth.

After a lengthy discussion and weighing the advantages and disadvantages, the Board decided the disadvantages outweigh the advantages and voted to call each fruit grower to ask him to "stop using Penncap". ❑

More On Boxes For Peaches

Jerome L. Frecon, Gloucester County Agricultural Agent

The article entitled "Which Box to Use For Peaches in 96" in the June 11 newsletter stimulated quite a bit of discussion. A few additional comments made by grower/shippers included: "don't forget per package charges at the distribution centers and per package shipping charges by the truckers." If rates are charged per package, cost will be higher per pound of peaches for the 25 lb box.

Many grower/shippers feel fruit condition would be better in the 25 lb box than a 38 lb box because there is less box depth.

Some grower/shippers also feel buyers resist purchasing peaches when the unit cost gets too high. They feel by reducing the size of the unit - the box, the price per pound of peaches can be raised but the unit cost per box stays below that imaginary maximum limit.

Finally and most importantly, one grower/shipper told me my figures were inaccurate. I stated if the box costs were increased 25% the price of fruit would have to go up 25%. *He was correct and I was wrong.* The actual increases in the price of the fruit is about 10%. Hence, if peaches average $.42 per pound in a 38 lb box then $.45 per pound should cover all of the same costs and be an equivalent price in a 25 lb box. I apologize for any problems this may have caused. ❑

Weather Summary for the Week Ending 6/24/96

Keith Arnesen, Agricultural Meteorologist

Temperatures averaged near normal. Extremes were 90 degrees at Woodstown on the 18th and 51 degrees at Charlotteburg and Newton on the 24th. Weekly rainfall averaged 1.64 inches North, 2.89 inches Central, and 1.48 inches South. The heaviest 24 hour total was 2.28 inches at Pomona on the 21th to 22nd. Estimated soil moisture, in percent of field capacity, this past week averaged 80 percent North, 91 percent Central, and 72 percent South. Four inch soil temperatures averaged 70 degrees North, 73 degrees Central, and 75 degrees South. ❑

Weather Summary for the Week Ending 8 am Monday, 6/24/96

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
BELVIDERE BRIDGE	2.40	15.26	.78	84	54	68.	-1	739	-12	96
CANOE BROOK	1.40	18.37	2.76	87	55	71.	1	935	217	97
CHARLOTTEBURG	.86	18.16	2.42	82	51	68.	1	774	220	65
FLEMINGTON	3.44	19.68	4.78	85	54	70.	0	873	127	97
LONG VALLEY	.76	15.52	-.44	82	53	68.	1	773	162	69
NEWTON	.99	17.12	2.96	82	51	68.	0	762	135	72
LONG BRANCH	1.56	13.13	-1.63	86	58	70.	0	847	80	74
NEW BRUNSWICK	1.16	17.28	2.96	86	55	71.	-1	903	20	92
PEMBERTON	4.43	18.10	3.95	89	58	73.	2	1096	229	92
TRENTON	4.40	24.30	10.99	86	56	71.	-2	937	3	94
CAPE MAY CRT HOUSE	1.59	15.75	2.83	86	63	75.	4	925	85	69
DOWNSTOWN	1.59	13.45	.26	89	62	75.	3	1014	60	72
GLASSBORO	1.01	16.95	2.70	87	65	75.	3	1074	141	63
HAMMONTON	1.31	14.42	.55	89	61	75.	3	1032	107	57
POMONA	2.29	15.21	2.59	89	58	74.	3	950	104	69
SEABROOK	1.09	17.01	4.42	88	62	76.	4	1038	78	64
WOODSTOWN	1.60	16.15	1.39	90	62	76.	NA	1079	NA	NA

Fruit IPM

Week Ending 6/28/96

Dean Polk, IPM Agent - Fruit

◆ Apple

✔ **Spotted tentiform leafminer (STLM):** Adults continue to lay eggs which hatch into the second brood of summer larvae. While trap counts have exceeded 4,000 males per trap on some farms, counts of sap feeding miners remain low. No treatments are needed on any scouted farm at this time.

✔ **Tufted apple budmoth (TABM):** The first adult flight has peaked. While most egg laying has already occurred, significant activity is still present with the heaviest adult populations in Gloucester and Burlington Counties. According to the degree day model we use, we should be through with first generation sprays in southern counties. However, since some trap counts are still in excess of 200 moths per trap, we are still suggesting treatments where trap counts are high. Treatments applied this week in most southern locations should be the last for this generation. The Skybit degree day accumulations and ground level counts have been relatively close where monitored. Ground level counts from Bridgeton appear to be slightly ahead of Skybit counts. Because of the Penncap and bee issue we suggest using Lorsban 50W where possible.

✔ **Codling moth (CM):** Codling moth trap levels have increased above the 5 moth per trap threshold in several locations. Most labeled organophosphate materials (Guthion, Imidan, Lorsban) can be applied for control.

✔ **Apple aphids:** Aphid populations have increased slightly since last week. These should be tolerated where possible, or treatment should be delayed until treatment is needed for some other more important pest. For example, since STLM adults are now laying eggs and producing sap feeding miners, the possibility exists that within the next week to 10 days some farms may benefit from treatment. The same materials that control STLM (Vydate, Lannate, Provado), also control aphids. Therefore you may get more "bang for the buck" by waiting. If you elect not to wait, be aware that other materials such as Cygon or Lorsban have no activity for leafminers.

✔ **European red mites (ERM):** Overall populations are below treatment levels, although some farms in northern counties have 12 to 14 mites per leaf. These higher counts are from blocks where no pre-bloom or other early season miticide was applied. The predatory mite *Amblyseius fallacis*, is present in a few orchards at up to 1 predator per leaf. This represents a high predator population, and will probably keep most red mite populations in check. The small black lady beetle mite predator *Stethorus punctum* is controlling some populations. In the rare cases where populations need treatment and miticide options are not working, growers may wish to use Lorsban 50W + oil combinations. Use 2 lb Lorsban/100 gal + 1 to 2 qt oil + B1956 or X77 applied to every middle in 100 gal of spray /A. Repeat this spray in 7 days time. Mite populations must exceed 5 to 6 mites per leaf on full crops to justify treatments. Some growers have used Kelthane with unsatisfactory results. Agrimek may also be used, and although it is getting late for its use, it still may be more effective than the alternatives.

◆ Peach

✔ **Oriental fruit moth (OFM**): The second flight of OFM adults is well underway. We have no model for this generation, but advise treatments if trap counts exceed 6 to 8 males per trap per week, and/or if any flagging was seen from the first generation. This is the first generation which will cause substantial fruit feeding. Good coverage is important. In past seasons we have seen fruit damage in 3 to 4 orchards which were treated with 20 to 25 gal/A concentrate sprays.

✔ **Tufted apple budmoth (TABM):** Please see apple section above. Lorsban is not labeled for peach and nectarine use.

✔ **Bacterial spot:** Because disease pressure has been heavy, treatments should continue until 3 to 4 weeks pre harvest. Use the maximum amounts of Tenncop (8 oz/A) where possible with decreased spray intervals. Concentrate applications will demand lower amounts of Tenncop (5 to 6 oz/A).

✔ **Brown rot:** Brown rot infections have been seen on 6 farms on green fruit. Sulfur use alone is marginal under heavy disease conditions. Where fruit is injured from bacterial spot, storms, catfacing insects, or is showing split pits, Captan @4 lb/A would be a better choice. While we in NJ have always considered 4 lb of Captan 50W to be a full rate, the label does list higher doses. Under heavier disease pressure growers could use 6 to 8 lb/A. If using some of the more expensive materials such as Rovral (save for post harvest), Ronilan, Indar, Orbit, and other SIs, try to use them in combination with reduced rates Captan when possible.

◆ Blueberry

✔ **Leafroller larvae:** Adult trap captures of **Obliquebanded leafroller (OBLR)** have increased again as adults continue to emerge. These trap captures are quite high compared to other years from which we have data. There are 2 adult flights per season. These adults resulted from overwintered larvae, and will produce a summer brood which can feed on foliage and berries. Females may lay a total of 900 eggs on the upper leaf surfaces during their 7 to 8 day oviposition period. Eggs take from 1.5 to 2 weeks to hatch. While larvae feed on both foliage and fruit, it is the older larvae that can do most of the damage to fruit. A late summer to fall brood is also produced. This brood will likely not cause fruit damage since it is produced after most fruit has been harvested.

The second of 3 **Redbanded leafroller** flights is near peak. Several farms in Atlantic County have over 100 males per trap. One location recorded 400 males per trap. These represent the highest counts since we have started taking this data (since 1988). Fortunately, RBLR is easy to manage. Most organophosphate materials (Guthion, Imidan, Diazinon (watch label)) are very effective for this pest. Lannate and Asana are the most effective compounds for RBLR and OBLR control.

✔ **Sharpnosed leafhopper:** Adult trap captures have increased again since last week, especially in wild sites. We should be close to a peak for this insect. Growers with nursery stock and/or who are concerned with stunt disease, may wish to treat for SNLH in the near future.

✔ **Cranberry fruitworm (CBFW):** Overall adult activity has decreased as we reach the end of the adult flight. Low counts of minor adult activity may continue as in past years.

✔ **Aphids**: Aphids continue their presence, but at slightly lower levels from last week. This is partly due to insecticide treatments. Please be aware that Ciba, Micro Flo and Gowan do not have blueberries on any 1996 diazinon labels that are currently available. The Ciba Diazinon AG600 WBC label had blueberries approved on June 21. However this will not be in New Jersey until July 5th. The label for the AG600 WBC formulation will call for 13.5 oz/100 gal or a max. of 27 fl oz/A, with no more than 135 fl oz/A applied per season. There will be a 7 day PHI.

✔ **Blueberry Maggot:** The first maggot flies were caught this past week in commercial plantings. Captures at our abandoned sites have been very low.

◆ Insect Trap Captures

Week Ending	5/17	5/24	5/31	6/7	6/14	6/21
Tree Fruit - Southern Counties						
RBLR	4.0	1.8	0.5	0.5	0.5	26.8
STLM	744	276	76.6	283.1	1005	1876
TABM-A	5.8	21.5	29.0	76.3	75.7	59.4
CM	1.7	7.5	6.3	1.4	1.6	4.3
AM	—	—	—	—	—	1.0
OFM	6.6	11.9	10.7	2.7	4.5	8.4
TABM-P	7.4	48.7	70.1	78.9	68.5	46.3
LPTB	20.8	96.3	67.1	44.7	72.9	102.2
PTB	—	2.0	0.02	0.2	2.3	3.5
Tree Fruit - Northern Counties						
RBLR	20.0	17.5	4.0	3.1	0.0	9.8
STLM	199	119	43.9	13.1	352.5	1085
TABM-A	0.5	3.3	10.5	12.6	26.5	32.2
CM	0.3	6.1	8.4	8.0	7.2	11.5
AM	—	—	—	—	—	—
OFM	3.2	7.8	4.8	6.4	3.9	9.5
TABM-P	0.5	0.4	15.2	2.2	18.2	52.0
LPTB	0.4	12.4	13.3	28.4	105.8	74.8
PTB	—	1.9	3.2	7.0	17.0	13.2
Blueberry - Atlantic County						
RBLR	4.1	8.6	0	0.2	27.3	178
OBLR	0.4	0.4	1.6	13.3	22.8	31
CBFW	0.0	0.5	1.5	2.4	0.7	1.2
SNLH	—	—	—	0.9	3.8	2.3
BBM	—	—	—	—	—	0.2
OB						403
Burlington County						
RBLR	2.8	0.7	0.3	0.0	0.1	41.5
OBLR	0.0	0.1	0.6	10.3	34.1	46.5
CBFW	0.0	0.6	2.6	21.9	12.7	2.9
SNLH		—	—	0.5	2.9	7.9
BBM	—	—	—	—	—	0.0
OB						—
Abandoned Fields (both counties)						
RBLR	1.5	0.8	0.0	0.0	3.0	38.3
OBLR	0.0	0.0	0.5	3.0	14.3	59.0
CBFW	0.0	0.0	0.3	1.5	1.0	1.7
SNLH	—	—	—	12	15.0	53.2
BBM	—	—	—	—	—	0.0

Insect key: RBLR = redbanded leafroller, STLM = spotted tentiform leafminer, TABM = tufted apple bud moth, CM = codling moth, AM = apple maggot, OFM = oriental fruit moth, LPTB = lesser peachtree borer, PTB = peachtree borer, OBLR = oblique banded leafroller, CBFW = cranberry fruitworm, SNLH = sharpnosed leafhopper, BBM = blueberry maggot, OB = oriental beetle.

Insect Degree Day Accumulations as of 6/24

Insect	Site & County Biofix Date plus Degree Days Since Biofix						
	Bridgeton Cumb.	Hammonton. Cam.	Hardingville Glou.	Richwood Glou.	Princeton Mercer	Oldwick Hunt.	Morristown Morris
OFM_{45}	4/20 hit 200 on 5/2 hit 400 on 5/19	4/5 hit 200 on 4/27 hit 400 on 5/13	4/19 hit 200 on 5/1 hit 400 on 5/18	4/17 hit 200 on 5/1 hit 400 on 5/18	4/19 hit 200 on 5/3 hit 400 on 5/19-20	4/22 hit 200 on 5/9 hit 400 on 5/22	4/24 hit 200 on 5/14 hit 400 on 5/24
$TABM_{45}$	5/4 - 1085 hit 490 on 6/4 hit 625 on 6/9 hit 763 on 6/14 hit 898 on 6/18 Ground max/min 6/23=1386	5/3 - 1090 hit 490 on 6/3 hit 625 on 6/9 hit 763 on 6/14 hit 898 on 6/18 Ground max/min 6/23=1023	5/2 - 1113 hit 490 on 6/2 hit 625 on 6/8 hit 763 on 6/13 hit 898 on 6/17	5/2 - 1115 hit 490 on 6/3 hit 625 on 6/8 hit 763 on 6/13 hit 898 on 6/17 Ground max/min 6/23=1194	5/13 - 950 hit 490 on 6/9 hit 625 on 6/13 hit 763 on 6/18 hit 898 on 6/23	5/20 - 840 hit 490 on 6/12 hit 625 on 6/16 hit 763 on 6/22 predict 898 on 6/26	5/23 - 527 hit 490 on 6/15 hit 625 on 6/20
CM_{50}	5/8 - 806 hit 250 on 5/28 Ground max/min 6/23=1090	5/8 - 801 hit 250 on 5/28 Ground max/min 6/23=739	5/8 - 810 hit 250 on 5/28	5/8 - 811 hit 250 on 5/28 Ground max/min 6/23=883	5/11 - 771 hit 250 on 5/31	5/20 - 661 hit 250 on 6/7	5/20 - hit 250 on 6/7

All reported accumulations based on Skybit Inc. data with some ground verification. 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; 2nd generation at 1250 - 1300 °D after biofix + another spray 14 to 21 days later.