

# PLANT & PEST ADVISORY

FRUIT EDITION \$1.50

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## Orchard Weed Control

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

The weed control program for the orchard should consider the weed-free strip under the tree and the sod middles between the tree rows separately. In addition, the program implemented in the spring depends on whether herbicides were applied the previous fall. Two applications of residual herbicides are recommended in the weed-free strip under the trees. The first application should be applied in late fall, after the trees are dormant, but before the soil freezes. The second should be applied in late spring. Orchards that are sprayed with residual herbicides only once a year should be treated in early to mid spring.

Row middles should be maintained in perennial grass sod. Many broadleaf weeds are alternate hosts for disease, insect, and nematode pests. Control orchard **broadleaf weeds**, including **dandelion, clover**, and other weeds with 2,4-D in the fall or early spring.

### ◆ Recommendations

- I. No herbicide applications made in the fall.
    - A. Orchard row middles (sod) - apply 2,4-D (Weedar 64) at 1.0 qt/a before **dandelions** bloom to reduce competition for bees during apple bloom, to eliminate the weed as an alternate host for diseases and nematodes in peaches, and to prevent equipment overheating due to radiators becoming plugged with seedheads later in the spring.
    - B. Orchards with the following characteristics,
      1. No serious **perennial weed** problems
      2. An open canopy, with sunlight reaching the weed-free strip under most trees
      3. A history of heavy or late season **annual grass** pressure
      4. Varieties that mature later in the season should be sprayed in early spring (April) with the following.
 

Solicam 80DF	3.0 - 4.0 lb/a
+	+
Karmex 80DF	1.0 - 1.5 lb/a
+	+
2,4-D (Weedar 64) 4A	1.0 qt/a
- Add 0.25 to 0.33 pounds of Sinbar 80DF to improve **broadleaf weed** control early in the season when dry weather follows application.
- C. Orchards with the following characteristics:

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# Blueberry Pests

Sridhar Polavarapu, Ph.D., Entomology and IPM

**Cranberry weevil (Blueberry blossom weevil):** Adult counts have considerably increased in the abandoned fields in Burlington and Atlantic Counties. This would be a good time to check your field to determine if insecticide treatments are necessary to control cranberry weevil and other caterpillar pests. Black spots resulting from adult feeding punctures were found in several scouted fields. The adult

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1. **perennial weed** problems
2. dense canopy, with fully shaded weed-free strips
3. light **annual grass** pressure
4. early maturing varieties should be treated in late spring (May) with the following.

Sinbar 80DF*	1.0 - 2.0 lb/a
+	+
Karmex 80DF	1.0 - 2.0 lb/a
+	+
Roundup 4SC	0.75 - 1.0 qt/a
or	or

Gramoxone 2.5SC + NIS 1.0 qt/a + 0.25%  
\* Substitute Solicam 80DF at 3.0 to 4.0 lb/a for Sinbar if **annual grass** pressure is severe.

II. Herbicide applied during the previous fall.

- A. ONLY 2,4-D (Weedar 64) applied - see I.B. or I.C.
- B. 2,4-D (Weedar 64) and simazine (Princep) applied - **annual broadleaf** control will last until June. **Annual grass** control may break earlier. Use I.B. or I.C., with 2,4-D only if needed, or Roundup if **annual grasses** emerge.
- C. 2,4-D (Weedar 64), Solicam, and Princep applied in the fall.

Apply the following anytime in mid to late spring (April to early June).

Solicam 80DF	1.0 - 2.0 lb/a
+	+
Karmex 80DF	1.0 - 1.5 lb/a
+	+
2,4-D (Weedar 64) 4A	1.0 qt/a only if needed

Note - apply a total of 3.0 to 4.0 lb of Solicam 80DF per acre per year.

Consult the Commercial Tree Fruit Recommendations book for residual herbicide rates for your soil type and additional information. □

# Fruit IPM

Week Ending 4/25/96

Dean Polk, IPM Agent - Fruit

## ◆ Apple

**Rosy apple aphids (RAA):** RAA are present in several locations. Aphids are completely hatched at this point. First generation adults are present in southern locations (the first adults usually appear at the pink stage of bud development). About 3 generations will take place in apple before the insects disperse to alternate hosts, primarily narrow leaf plantain. Therefore RAA can be present in apple trees through much of June. While we cannot predict what kind of season it will be for RAA, we do know it takes only 1 aphid to curl a leaf. Waiting until petal fall before initiating controls is not advised, especially if healthy aphid populations are present.

**Spotted tentiform leafminer (STLM):** Trap catches of adult male moths have increased significantly over the last week. Mating and egg laying is ongoing, and will continue to increase through bloom and shortly thereafter. Spring brood females lay an average of 16 eggs per adult. Adult populations, as measured by trap counts, can reach over 2,000 moths per trap per week. A limited sampling of egg laying has shown that sampled fruit clusters have from .05 to .2 eggs per cluster. This is below the treatment threshold established in New York for this insect at the pink bud stage of development. Most eggs have been found on Macintosh, which develops earlier than other cultivars.

**Tufted apple budmoth (TABM):** No adult activity has been seen to date, although emergence is expected in the very near future. Larvae overwinter on the orchard floor in various stages of development. As the spring temperatures warm up, they feed on weeds and root suckers before pupating and emerging as adults in mid to late April or early May. Egg masses consisting of 80 to 150 eggs per mass are laid on the upper leaf surface. Larvae hatch and spin down to a protected site to feed on and between leaves and fruit. There are 2 generations per year, with oviposition occurring throughout May and June and again in August. While most of our damage often comes from the second generation, management practices that decrease the first generation have a large impact on the total control of this pest. Many orchards in Gloucester County have experienced problems with TABM. Asana XL has a label for the control of overwintering larvae in several mid-Atlantic states, including New Jersey. Applications may be made at a rate of 8 to 14.5 oz/A in a minimum of 30 gal of water/A. Application rate is determined by the stage of the larvae. In general, use the lower rate at pink and the higher rate at petal fall. One caution is that these applications may adversely affect emergence of the mite predator, *Stethorus punctum* which also overwinters in the same locations as TABM. Since *S. punctum* is 90 to 100% emerged by petal fall, the later timing close to petal fall may let many of the predators escape the application. The ground cover application should only be used where TABM is a known problem. Please note that **this application is also labeled on peach.**

**Apple scab:** The first infection period was recorded in Gloucester County on 4/15 with 13 hr of wetting at 54°F. A second wetting period on 4/17 was not an infection period. Spore release is often highest during the bloom to petal fall period.

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# Tree Fruit Fungicide Review

Norman Lalancette, Ph.D., Tree Fruit Pathology

## ◆ Ergosterol: The “Cholesterol” of Fungi

Don't eat those eggs! Cut back on red meat consumption! Stay away from butter! We've all heard our doctors' warnings of clogged arteries and heart attacks. No doubt about it, eating too much cholesterol (and the fat that often accompanies it) can be deadly.

But cholesterol is necessary for human and mammalian life. Cholesterol is a key component in cell membrane structure and function. In fact, if we don't eat enough cholesterol, our bodies will manufacture it! So we can't live without it.

What's mammalian cholesterol got to do with fungicides and plant pathogenic fungi? Well, in fungi, the cholesterol is replaced by another sterol, called ergosterol. And like cholesterol in mammals, ergosterol is necessary for proper cell membrane function and structure. Thus, without ergosterol, fungi could not grow and reproduce.

In research to develop new fungicides, plant scientists and biochemists can take advantage of the cholesterol - ergosterol difference between mammals and fungi. By creating fungicides that attack only the fungi-specific steps in ergosterol biosynthesis, scientists can minimize the risk to human toxicity, yet have highly effective materials. And this approach has resulted in the development of a rather large class of fungicides called ergosterol biosynthesis inhibitors (EBI's).

## ◆ EBI Fungicide Activity

A wide variety of EBI fungicides are currently available for use on stone and pome fruit. Some of the most common ones available for use here in New Jersey are Orbit, Indar, Nova, Funginex, Rubigan, Procure, and Bayleton.

One might think that since these fungicides all inhibit ergosterol biosynthesis, their efficacy for controlling various fungal pathogens would be the same. Well, not exactly. Each fungicide has a different chemical structure, and this difference determines the location and degree to which the biochemical pathways are inhibited. Consequently, the fungicides exhibit varying degrees of efficacy against different pathogens. In a future article, we will examine some of these differences. However, in this review, we will focus on their similarities, which are just as important to know.

In general, the EBI's do not inhibit spore germination and initial cell growth. Why not? Well, picture a fungal spore as if it were a plant seed. Like the seed, the spore contains all the nutrients it needs to grow and infect a plant. The spore only needs a small amount of ergosterol for cell membrane production, which is required for germination. Now, since ergosterol production occurs at a faster rate than its incorporation into cell membranes, inhibition of ergosterol biosynthesis has little effect during the early stages of spore growth.

As the spore grows, its ergosterol reserves are used up, and therefore it must be replenished by newly manufactured ergosterol. But the EBI fungicides have prevented this manufacturing process, and so no new ergosterol is available for further growth. This inhibition can occur at any time after germination, including during colonization phase, when new lesions are formed, or even during subsequent sporulation. This mode of action explains why many EBI's exhibit excellent post-infection activity (after infection but prior to symptom development) or anti-sporulant activity (prevent spore production).

## ◆ Brown Rot / Apple Scab Disease Management

In addition to their mode of action, it is also important to know that EBI fungicides, as a group, are locally systemic. This has direct implications for proper use in disease management. Once applied, they can then “wait” safely within the plant tissue for an infection period to take place. An **apple scab** or **brown rot** fungal spore may happily germinate on the plant surface; but once it penetrates the plant tissue, ergosterol biosynthesis will be inhibited and subsequent growth prevented. In effect, the infection process is completely halted.

In a similar fashion, fungicides such as Nova or Rubigan could be applied post-infection, after an **apple scab** infection period was predicted by the Mills Chart. In this case, the fungus was “there first,” already in the tissue; but this has no control consequences. The fungicides will penetrate the tissue, inhibit ergosterol biosynthesis, and prevent further growth of the fungus. Lesions will never form and no symptoms will result, as if infection never took place.

In contrast to the EBI's, the older protectant fungicides, such as captan and mancozeb, create a film of fungicide on the plant surface. They are not systemic. When spores are present and environmental conditions are favorable, the spores begin to germinate, but are then killed by the fungicide. However, if these fungicides were applied just prior to a heavy rain, such as occurred on April 15 and 16, then a good amount of fungicide residue would be lost. As a result, subsequent protection would be questionable. An EBI fungicide, on the other hand, if given sufficient time to penetrate the plant tissue, would have remained in the plant, ready to act should infection take place. □

**Powdery mildew:** The fungus overwinters inside infected buds. Given the correct conditions (high humidity with temperatures from 65 to 80°), spores will infect new leaf tissue and fruit. Sensitive varieties should receive applications from tight cluster stage through 3rd or 4th cover. SI fungicides are particularly effective.

◆ **Peach**

**Oriental fruit moth (OFM):** Moths have now been caught in most areas of the state. This insect should be treated by applying insecticide at 200°D (base 45) after first adult catch (biofix) and again 200°D later after the first treatment. The Hammonton area has accumulated 62°D since biofix as of 4/19. Other areas just started accumulating.

**Catfacing insects:** Some catfacing insects have been seen in the ground cover, but numbers have been low. Treatment for these insects (tarnished plant bugs and stink bugs) is not suggested until petal fall. When petal fall treatments are applied, do not wait until all the petals are off the trees. When petals are partially fallen and the sprayer blows the remaining petals off is a good time to define the petal fall spray.

**Flower thrips and Western flower thrips (FT, WFT):** Thrips will injure fruit at 2 distinct periods of the season. The first period is from the petal fall through shuck split or shuck off period, while the second time is during the last 2 weeks of final swell. Early season feeding results in a rusty type of fruit scar. Lannate @.5-.75 lb/A or Carzol @8-10 oz/A will control this insect. Use Lannate if green peach aphid control is also desired, or Carzol if mite suppression is desired. There are 2 formulations of Lannate: 2 pt of Lannate LV = 9.28 oz a.i., .75 lb of Lannate SP = 10.8 oz a.i.

**Bacterial spot:** Applications for bacterial spot control should start at petal fall. Use either Mycoshield @ 1 to 1.5 lb/A depending on tree size or Tenncop 5E @ 4oz/100 gal dilute. This means that the copper should be applied at 8 oz/A in spray volumes of at least 100 gal/A. At volumes of less than 100 gal/A use less material (5-6oz/A). Higher amounts may be used in cooler weather, but in hot weather dosage may need to be reduced. Do not use copper on nectarines since spotting may occur.

◆ **Blueberry**

**Cranberry weevil:** Both adults and feeding injury continue to be seen, especially around field edges near wooded areas. Buds which have either holes chewed in them or entire areas removed are both evidence of weevil feeding.

**Redbanded leafroller (RBLR):** Leafroller adults continue to emerge and lay eggs. There are 3 generations a year of this insect. While most leafrollers lay eggs in masses on the upper leaf surface, most egg laying from this generation of RBLR will be found on the wood itself. Larvae are usually found during bloom at low levels, and are not a problem during most years. Higher trap counts are being seen in Atlantic County in more intensely managed fields. Abandoned fields have very low counts.

◆ **Insect Trap Captures**

Week Ending	4/4	4/11	4/18
<b>Tree Fruit - Southern Counties</b>			
RBLR	1.1	1.9	16.3
STLM	20.4	48.1	1236
TABM-A	—	—	0.0
CM	—	—	0.0
AM	—	—	—
OFM	0.1	.03	0.5
TABM-P	—	—	0.0
LPTB	—	—	—
PTB	—	—	—
<b>Tree Fruit - Northern Counties</b>			
RBLR	—	22.0	41.5
STLM	—	7.0	355
TABM-A	—	—	0.0
CM	—	—	—
AM	—	—	—
OFM	—	0.0	2.5
TABM-P	—	—	0.0
LPTB	—	—	0.0
PTB	—	—	—
<b>Blueberry - Atlantic County</b>			
RBLR	—	14.4	51
OBLR	—	—	—
CBFW	—	—	—
SNLH	—	—	—
BBM	—	—	—
<b>Burlington County</b>			
RBLR	—	3.8	8.8
OBLR	—	—	—
CBFW	—	—	—
SNLH	—	—	—
BBM	—	—	—
<b>Abandoned Fields (both counties)</b>			
RBLR	—	1.0	7.0
OBLR	—	—	—
CBFW	—	—	—
SNLH	—	—	—
BBM	—	—	—

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weevils feed for a few days on expanding flower and leaf clusters before initiating egg laying. Insecticide treatments are most effective when applied before the females have begun laying eggs inside the unopened blossoms. Insecticide sprays to control cranberry weevil are not required unless an average of 5 or more adults are present per bush or at least 20% of the flower clusters are infested. If damage is localized along the field edges, consider treating only the border rows along the woods and brush.

**Redbanded leafroller (RBLR):** The pheromone trap counts of RBLR have shown an increase this week in all scouted areas in Burlington and Atlantic Counties. However, leafroller larvae have not been found in any significant numbers in any of these areas. Insecticide treatments are necessary only if an average of 1 or more larvae (combined numbers of leafrollers, spanworms and gypsy-moth larvae) are found per 100 leaf and flower clusters. □

## More On Vydate L

Jerome L. Frecon, Gloucester County Agricultural Agent

Vydate L has a federal registration as an insecticide on apples. It does not have a federal registration yet as a chemical thinning agent for apples.

In the April 9, 1996 issue of the Plant Pest Advisory Newsletter - Fruit Edition Vol. 1 No. 2, page 7 an article is quoted from Penn State Fruit Times "You must have a copy of that label in your possession to use it as a chemical thinner for apples". Since the labels at the federal level have not been approved and New Jersey local needs (240) labels, growers will not be able to obtain a copy of the label for update for chemical thinning of apples. Growers in other states may be able to obtain local needs labels and should check with their respective agencies. □

## Ag Weather Advisory

Keith Arnesen, Agricultural Meteorology

The phone number for the weather advisory has been changed from last year. The new number is 908-932-4988 (voice). Even though the National Weather Service eliminated all Agricultural forecasts nationwide last fall, the local national weather service office at Mt. Holly has agreed to broadcast the advisory as usual over NOAA weather radio for a couple of hours after 7 am each day. During Mondays through Fridays forecasts will be available at about 7 am and a noon update. They can be obtained by dialing the above number or over the extension bulletin board, or AERDI, and over the Web through the NJ State Climatologist: <http://climate.rutgers.edu/stateclim/> or through <http://cook-college.rutgers.edu/htbin/agweather.com> □

## Twilight Fruit Meeting In Gloucester County

April 30, 1996, 7:00 p.m.

Gloucester County Office Building  
1200 N. Delsea Drive, Clayton, NJ 08312

- ✓ *Update and Observations on Tree Fruit Insect and Disease Activity* by Dave Schmitt, IPM Program Associate - Tree Fruit, Rutgers Cooperative Extension
- ✓ *Update on Weed Control in Tree Fruit* by Brad Majek, Specialist in Weed Science, Rutgers Cooperative Extension
- ✓ *Update & Comments on Fruit Tree Management and Rutgers Cooperative Extension Programs* by Jerome L. Frecon, Agricultural Agent, Rutgers Cooperative Extension of Gloucester County
- ✓ *IPM Tree Fruit Recommendations & Observations* by Dean Polk, Statewide IPM Agent, Rutgers Cooperative Extension
- ✓ *Update on Insect Technology and Control in Tree Fruit* by Dr. Peter Shearer, Extension Specialist in Plant Pathology, Rutgers Cooperative Extension
- ✓ *Pesticide Safety and Worker Protection Training* by Jerome L. Frecon, Agricultural Agent, Rutgers Cooperative Extension of Gloucester County
- ✓ Pesticide recertification units for category and core will be given at the close of meeting for those attending

Other Meetings will be:

May 8, 1996 - Rutgers Research & Development Center, Bridgeton, N.J.

May 22, 1996 - Zee Orchards, Glassboro, NJ

Insect Degree Day Accumulations							
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 <sub>45</sub>	4/20	4/5 - 62	4/19	4/17	4/19	4/22	
TABM <sub>45</sub>							
CM <sub>50</sub>							
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.