

# PLANT & PEST ADVISORY

FRUIT EDITION \$1.50

JULY 15, 1997



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## Pesticide Mixing and Evaluation for Compatibility

*Submitted by Jerome L. Frecon, Gloucester County Agricultural Agent*

*The following article was excerpted from Blueberry Bulletin, Vol. XIII, No 13 - July 10, 1997.*

A convenient and economical method for controlling several pest problems at once is through the use of pesticide mixtures. Fungicides and insecticides are commonly used in combination for disease and insect control. Many problems can arise from inappropriate use of mixtures. Chemicals that are physically incompatible form an insoluble precipitate that clogs nozzles and sprayer lines. Other mixtures may be phytotoxic and result in a crop loss. This results from either a direct interaction of the active ingredients or an interaction of the inert ingredients in one formulation that enhances the toxicity of the other one. A third type of incompatibility arises when one component of the mixture reduces efficacy of the other component. When using mixtures there are several guidelines to follow:

1. Read the label and follow the manufacturer directions. A section specifically addressing compatibility is usually included on the label. If you are in doubt contact the manufacturer or a technical representative.

2. Obtain a compatibility chart and use it as a guideline only. Compatibility charts are frequently out of date because new pesticide formulations can alter compatibility. However, they provide useful baseline information.

3. Use a jar test to determine physical compatibility. Jar tests are conducted by mixing chemicals at approximately the same rate as specified on the labels. The volumes are scaled down to fit in a small (1 pint - 1 quart) container. Results are evaluated by observing the mixture for reactions such as formation of larger particles, the formation of layers or other changes that result in the formation of a precipitate (i.e. sludge at the bottom of the container).

4. Chemicals that are physically compatible may be phytotoxic. Therefore, mixtures of new chemicals should always be tested on a small number of plants before being sprayed on a larger area. Phytotoxicity may appear as wilting, spotting, die back or other abnormalities in plant growth. The appearance of phytotoxicity may be environmentally controlled. For example, high temperatures may cause more severe

SEE MIXING ON PAGE 3

# Fruit IPM

Dean Polk, IPM Agent, Fruit

## ◆ Peach

✓ **Oriental Fruit Moth (OFM):** Adult trap catches are low on most farms, but above 6-8 males per trap in some blocks. Flagging from first brood larvae should be evident in poorly sprayed blocks. In one test block at Cream Ridge, we see 3 to 4 flags per 2 year old tree. Flags will appear as turned down brown or dried up tips on the current year's growth. In some cases larvae have entered the fruit. Look for jelly and frass on the sides and stem end of the fruit.

✓ **Catfacing Insects:** Catfacing pressure is moderate to high in southern counties with 1 to 2% fresh injury common. Pest pressure is somewhat lower in northern counties.

✓ **Tufted Apple Budmoth (TABM):** Third instar larvae are common in a number of blocks in southern counties. Insecticides that specifically target TABM are not suggested at this time.

✓ **European red mites (ERM):** ERM populations are present in over 75% of peach samples, with some blocks having over 50 mites per leaf. While we do not have a treatment level for ERM on peaches, experience has shown that pickers often complain when ERM populations exceed 20 mites per leaf. We also do not know the effect that high mite populations have on the tree or crop for the following year. Apollo has worked well when used at 3 oz/A. There is a 3 week PHI for this product.

✓ **Brown rot:** Overall, disease pressure is low due to hot, dry weather. However, high humidity and hot temperatures can provide favorable conditions for the establishment of brown rot. Low levels were seen this past week on garnet beauty. Because of the lack of precipitation, a number of growers are taking the risky strategy of not using SI, Rovral or Ronilan fungicides

during the preharvest period. Even though we have had minimal precipitation over the last several weeks, combinations of Captan @2 lb/A plus one of the above fungicides are suggested.

## ◆ Apple

✓ **Tufted apple budmoth (TABM):** See timing listed under peach, above.

✓ **Codling moth (CM):** The first treatments for second generation CM will be due in southern counties starting late this week and early next week. This is about a week to 10 days earlier than last year.

✓ **Spotted Tentiform leafminer (STLM):** Newly emerged second brood sap feeding larvae are still present in a number of plantings. Care must be taken if leafminers need to be treated when mites are also present. Provado has aggravated mite populations in the past. Lannate is also harsh on mite predators. While there is no "good" choice for choosing a leafminer material that also is harmless to mite predators, Vydate has worked @2.5-3 pt/A. Although it does effect predator populations, it also will suppress mite populations.

✓ **Sooty blotch and fly speck:** According to model information sooty blotch and fly speck infections started this past week. Fungicide programs should be geared for fruit rots and these diseases at this time.

## ◆ Blueberry

✓ **Leafrollers and other Leps:** Larvae are being found, but at very low levels. One farm was seen where populations were about 1.5 larvae per bush - above threshold levels. In this case Imidan or Lannate should be used in place of Malathion. Lannate will control both leafrollers and aphids, as long as the high rate of Lannate is applied.

✓ **Cranberry fruitworm (CBFW):** CBFW larvae infest about 16% of monitored sites at very low levels. Most are in 1 or 2 fields which had higher adult populations in the spring. No infested fruit are being seen on the sorting line, since the blowers are removing them.

✓ **Sharpnosed leafhopper (SNLH):** Adult populations are at similar levels as was reported last week. Counts in Atlantic County are slightly lower. In general, trap catches on Burlington County farms are 2 to 3 times higher than in the Hammonton area.

✓ **Anthracoese:** Field sampling indicates very low infection rates to date. As mentioned earlier, samples are being collected and incubated for post harvest analyses in order to get a more accurate picture.

### Tree Fruit Pest Degree Day Accumulations Since 1<sup>st</sup> Catch - 7/12/97

Site	Biofix/1 <sup>st</sup> Catch Date & DD - TABM		Biofix/1 <sup>st</sup> Catch Date & DD - CM	
Hammonton - At. Co.	5/2	1480	5/9	1061
Hardingville - Glou. Co.	4/30	1511	4/30	1158
Bridgeton - Cumb. Co.	5/1	1511	5/2	1147
Princeton - Mercer Co.	5/12	1340	5/5	1067
Oldwick - Hunt. Co.	5/17	1239	5/16	962
Hackettstown - War. Co.	5/22	1151	5/9	989
<b>Spray target after biofix/1<sup>st</sup> catch</b>	<b>Alt Mid Appl. at 490, 625, 763, 898 (1<sup>st</sup> brood), and 2228, 2415, 2605, 2795 (2<sup>nd</sup> brood)</b>		<b>250 DD plus 2 weeks later (1<sup>st</sup> generation), 1250-1300 DD plus 2-3 weeks later (2<sup>nd</sup> generation)</b>	

◆ **Trap Averages**

**South Jersey Tree Fruit**

Week Ending	RBLR	STLM	TBM-A	CM	AM	OFM	TBM-P	LPTB	PTB
5/2	30.8	885	0.06	0.04	—	56.9	0.08	—	—
5/9	25.3	1177	4.5	1.0	—	39.5	3.0	—	—
5/16	7.0	822	30.2	2.6	—	12.9	50.6	0.7	—
5/23	2.8	478	33.8	9.3	—	18.3	40.4	28.1	0.02
5/30	0.8	270	43.4	3.7	—	9.6	50.2	19.1	0.05
6/6	0.0	96	34.1	1.9	—	5.8	40.0	30.2	0.2
6/13	0.1	390	32.6	2.2	—	2.6	44.4	21.4	0.04
6/20	3.1	1036	58.0	4.9	—	5.4	74.3	19.9	0.5
6/27	26.9	1169	52.2	3/7	—	13.8	69.9	31.1	0.4
7/4	47.4	1517	45.9	1.9	.11	11.1	53.1	32.7	1.5
7/11	37.4	1507	19.8	1.4	.04	9.9	21.4	24.7	3.3

**North Jersey Tree Fruit**

Week Ending	RBLR	STLM	TBM-A	CM	AM	OFM	TBM-P	LPTB	PTB
5/2	40.2	1080	0.0	0.01	—	3.3	0.0	—	—
5/9	22.2	980	0.0	0.3	—	26.2	0.0	—	—
5/16	10.7	902	1.0	1.3	—	6.0	0.1	0.1	—
5/23	2.0	157	1.9	1.2	—	4.1	0.6	0.9	—
5/30	2.4	252	5.8	2.6	—	6.7	2.6	0.5	0.1
6/6	0.3	26	3.0	3.1	—	4.8	2.3	5.3	0.6
6/13	0.05	268	8.4	3.5	—	4.2	6.8	21.6	1.5
6/20	0.1	374	21.1	5.5	0.0	2.5	19.2	22.3	1.5
6/27	5.2	658	19.1	5.1	0.0	2.1	14.5	17.4	1.0
7/4	1187	552	43.5	5.3	0.0	2.1	6.4	2.0	12.2
7/10	16.9	1330	13.9	1.9	0.0	3.0	5.8	0.8	1.0

**Blueberry**

Atlantic Co.

Week Ending	RBLR	OBLR	CBFW	SNLH	BB
5/2	107				
5/9	27.5	0	0	—	—
5/16	7.4	0	0.5	—	—
5/23	1.5	0	2.6	—	—
5/30	0.5	0.5	12.0	—	—
6/6	0	3.1	8.1	—	—
6/13	0.2	8.3	2.2	0.0	0.0
6/20	35.1	14.0	0.6	0.5	0.0
6/27	105	13.4	0.6	1.8	.02
7/4	97	3.4	0	1.5	.04
7/11	95	1.6	.04	0.8	0.2

Burlington Co.

Week Ending	RBLR	OBLR	CBFW	SNLH	BBM
5/2	33.4				
5/9	14.0	0.2	0	—	—
5/16	5.6	0	0.3	—	—
5/23	1.8	0	0.9	—	—
5/30	0.06	0.4	5.6	—	—
6/6	0	0.4	2.9	—	—
6/13	0.8	6.1	2.2	1.5	0.0
6/20	4.0	12.8	0.8	2.6	0.0
6/27	36	6.5	1.1	2.9	0.3
7/4	47	1.8	.06	1.2	0.0
7/11	71	2.1	0.4	1.4	0.0

Wild Sites

Week Ending	At.Co. SNLH	Burl.Co. SNLH	At.Co. BBM	Burl.Co. BBM
6/27	—	8.7	—	0.0
7/4	13	14.7	0.0	11.0
7/11	8.0	9.6	0.0	4.6

*MIXING FROM PAGE 1*

expression of phytotoxicity. Environmental variables can play a big role in causing mixtures as well as single component sprays to perform not as predicted.

5. Use of spray additives, such as spreaders, stickers, or activators can greatly complicate chemical compatibility in mixtures. Unless recommended by the manufacturer, these additives should be avoided.

A final note. Mixtures provide an economical and efficient method for applying different classes of pesticides. Mixtures can provide enhanced activity through synergism and in some cases reduce the chance of resistance developing in the target population. Some chemical companies market pesticides pre-mixed. Thus, appropriate use of mixtures requires preliminary research to determine the compatibility. □

Rutgers Cooperative Extension - NJAES  
U.S. DEPARTMENT OF AGRICULTURE  
Rutgers - The State University of New Jersey  
P.O. Box 231  
Cook College  
New Brunswick, N.J. 08903-0231

## PLANT & PEST ADVISORY

### FRUIT EDITION - CONTRIBUTORS

#### RCE Specialists

Robert Belding, Ph.D., Pomology  
Joseph A. Fiola, Ph.D., Small Fruit & Viticulture  
Norman Lalancette, Ph.D., Plant Pathology  
Bradley A. Majek, Ph.D., Weed Science  
Peter Oudemans, Ph.D., Plant Pathology  
Sridhar Polavarapu, Ph.D., Entomology  
Peter W. Shearer, Ph.D., Entomology  
Craig A. Storlie, Ph.D. Agricultural Engineering

#### NJAES/Cook College

Joseph Goffreda, Ph.D., Breeding  
Edward Durner, Ph.D., Plant Physiology  
RCE County Agricultural Agents and Program Associates  
Gloucester, Jerome L. Frecon (609-863-0110)  
Hunterdon, Winfred P. Cowgill, Jr. (908-788-1338)  
Morris, Peter J. Nitzsche (201-285-8300)  
Warren, William H. Tietjen (908-475-6505)  
Cream Ridge, Dean Polk (609-758-7311)  
    Ken Petersen, Program Associate (908-788-1338)  
    Gene Rizio, Program Associate (609-784-1001)  
    David Schmitt, Program Associate (609-863-0110)

#### Newsletter Production

Jack Rabin, Assistant Director, NJAES  
Cindy Rovins, Editor and Designer

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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.