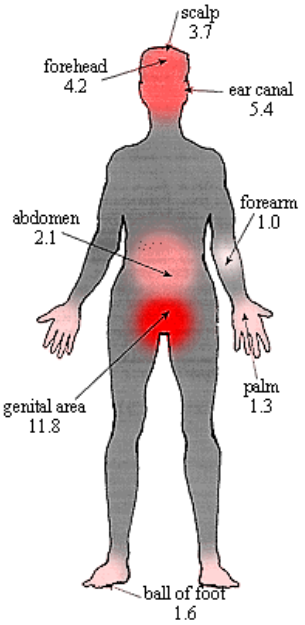
RUTGERS COOPERATIVE RESEARCH & EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

FRUIT EDITION $1.50 JULY 5, 2005

Figure 1



Relative absorption rates, as compared to the forearm (1.0)

INSIDE

Reducing Pesticide Exposure

Teryl Roper, University of Wisconsin-Madison, Extension Horticulturist

Reprinted from Cranberry Crop Management Newsletter, June 5, 2005, University of Wisconsin.

With the growing season well underway growers are on the constant lookout for pests that will need to be managed if populations exceed action thresholds. Most growers use some sort of pesticide product to manage pest outbreaks. When used in accordance with the label directions pesticides can be an effective and safe method of managing pests. However, the use of any pesticide product creates risk to the people who mix, load, and apply the product. Minimizing our exposure to pesticides will protect our health and that of our families.

Pesticides can enter the body through four main routes: Dermal (through the skin), Oral (through the mouth), Inhalation (through the lungs), and Ocular (through the eyes). Not all of these routes are equal. Oral, inhalation, and ocular are particularly dangerous because they all lead directly into internal parts of the body. The skin (dermal) receives the greatest amount of exposure and it is the most common route for pesticides to enter the body. The amount of pesticide that your skin absorbs depends not only on the chemical itself and the extent of the exposure, but also on the product's formulation, the area of your body that is exposed, and the condition of the exposed skin.

Different parts of the body absorb pesticides more efficiently than others. Figure 1 shows the relative absorbance compared to skin on the forearm. The head and the genital area are particularly absorbent. It is easy to pass pesticides from the hand to the head by such a simple action as wiping a sweaty forehead. Cuts and abrasions to the skin also allow pesticides to enter the body more readily.

Oral exposure is very dangerous, but relatively uncommon. It is almost always a result of extreme carelessness. The most common cause of human oral exposure is putting pesticides in unlabeled bottles or food containers.

Inhalation exposure is very hazardous because the lungs can rapidly absorb pesticides, especially vapors and dusts. When inhaled in sufficient quantities, pesticides can damage nose, throat, and lung tissues.

Ocular exposure is also rare. The eyes are very absorbent. Not only may your eyes be damaged by pesticide exposure, but enough pesticide may be absorbed through the eyes to cause serious illness or death.

SEE REDUCING EXPOSURE ON PAGE 2

REDUCING EXPOSURE FROM PAGE 1

Pesticide Protection

Wearing personal protective equipment greatly reduces your dermal, inhalation, and ocular exposure to pesticides. The personal protective equipment that is to be worn while mixing, loading, or applying any pesticide is listed on the product label in the Agricultural Use Requirements box.

Hands and forearms receive the most pesticide exposure. 85% of dermal exposure occurs on the hands and forearms. This can be reduced to 3% with the use of unlined chemical resistant gloves. Wear chemical resistant gloves when using any type of pesticide in any form of application. This includes wiping with Roundup. Leave the gloves on when adjusting equipment or opening pesticide containers. Do not wipe your face when wearing gloves. Leave the gloves on until the entire job is completed. After completing the task, wash your hands with the gloves on, then remove the gloves and thoroughly wash and dry your hands.

Faceshields will protect the eyes and head from pesticide exposure. Face protection is required when mixing and loading some pesticides. Wearing a chemical resistant hat with a wide brim will also reduce exposure.

Laundry

Clothing worn while working with pesticides should be laundered after each use. Wash this clothing separately from the family laundry. Put the clothing through one rinse cycle and then a complete washing/rinsing cycle using plenty of detergent.

Vehicles

Keep farm vehicles interiors clean so that pesticide contaminated dust will not be picked up when other people ride in the vehicle. Vacuum out the interior periodically and wipe down smooth surfaces with soap and water. One research study found that the level of pesticide contamination in dust found in farm homes correlated closely with that found in vehicles used by members of that family. Wipe off the seat and interior of tractors used to pull sprayers after each application.

Using pesticides in a safe manner will protect your health and the health of your family. Pesticide exposure can be minimized by following the label and using personal protective equipment and required. ❑

Japanese Beetle Management

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

The **Japanese beetle** has started to emerge in the southern part of New Jersey. They are out in very high numbers this year. This pest was introduced into New Jersey on nursery stock from Japan in 1913. Since its introduction, it has spread to most states east of the Mississippi River. It is now a seasonal pest and can cause extensive damage to many crops. The larvae feed on roots of plants and are especially damaging to turf and pasture. The adults feed on over 275 species of plants such as fruit trees, flowers, and vegetables.

Adults are about 3/8-1/2 inch long and metallic green to greenish bronze in color. They have white tufts of hair along the bronze forewing. Larvae are C-shaped white-to-cream-colored grubs with brown heads and are about 3/4-1 inch when full grown.

The Japanese beetle overwinters as a grub in the soil. In the spring, they move up towards the soil surface and feed on roots. Adults begin to emerge in late June and are active until late September. Females can lay about 50 eggs apiece 2-6 inches deep in the soil. It takes about 2 weeks for the eggs to hatch and newly emerging larvae feed on decaying matter then plant roots.

Adult feeding damages both leaves and fruit. Leaf damage usually takes the form of skeletonizing. Fruit feeding results in large holes in the fruit. Ripening fruit is often attacked making control necessary yet difficult because of pre-harvest interval (PHI) limitations of effective materials. Early peach and apple varieties are most susceptible to adult attack because their time of ripening occurs during Japanese beetle emergence.

Occasional scouting is required to determine if this pest is causing damage. Carbaryl (Sevin) can be used on stone and pome fruits when adult populations are high and damage can be seen. This product has a 3 day PHI for apples, peaches and nectarines, and a 7 day PHI for small fruits and berries. On apple, Imidan is effective and not considered disruptive to IPM programs. Imidan has a 7 day PHI for apple; 14 days for peaches, nectarine, apricots, and grapes. The fact that these materials do not provide quick knockdown and that new beetles invade from outside the orchard often gives the appearance that control measures are ineffective. Newer products such as Provado and Assail are also efficacious when used at higher rates. Provado has a 0 day PHI for peaches, nectarines, and apricots and a 7 day PHI for cherries. Assail has a 7 day PHI for pome fruit. Under high pressure, control measures should be applied more frequently. Always read and follow the label. ❑

Time to Treat Apples for Dogwood Borer

Win Cowgill, Agricultural Agent, Dean Polk, Fruit IPM Agent, and Meredith Compton, Tree Fruit IPM Program Associate

All apple trees in New Jersey should be periodically checked for **dogwood borer** (DWB) infestation. Apple growers in our NJ IPM scouting program have traps placed to monitor the adult moth. *We have been catching moths in Northern New Jersey orchards since the end of June.* Infestations of this clearwing moth in apple are almost always ***located in burrknots or graft unions*** that are planted above ground level. Burrknots are aggregations of root initials that can develop on the above-ground portion of the rootstock; all commercial dwarfing and semi-dwarfing rootstocks have a tendency to develop burrknots.

In recent years, the incidence of infestations by DWB, *Synanthedon scitula*, has become a serious problem on many apple blocks containing dwarfing apple root stocks.

Burrknots - It is important that we plant dwarf apples with the graft union at least four inches out of the ground to avoid self-rooting of the scion. However the trade off is the development of burrknots, which are susceptible to the dogwood borer. Mark rootstock is known for this.

The adult dogwood borer moth seeks out these spots to lay eggs, particularly if they are surrounded by vegetation or protected by something such as mouse guards. Moreover, mouse guards may frequently house weeds, and shield the lower trunk from incidental exposure to insecticide cover sprays. Sustained feeding by dogwood borer at the graft union may severely weaken the tree at this juncture, or girdle the trunk and cause a slow decline in tree health. Orchards in which mouse guards are emplaced should be examined for signs of damage.

Treatment- Loresban 4E has a supplemental label for dogwood borer control on apple. Since Loresban remains in the tissue you will also control the larvae from any egg laying occurring in the months of June and July as well as any that has occurred to date. A second application may be more effective than one application according to work done in New York State.

The best control is the dilute trunk applications with a handgun of an insecticide with good residual activity to provide control of established infestations. Lorsban 4E now has a supplemental label for apples and is the most effective material for control. If one application is made it should be applied during the period between July 15 and August 15, bearing in mind the specific pre-harvest intervals. Two applications are labeled and may be more effective**.** The first application of Loresban should go on now.

The following directions and restrictions are from the label:

Mix with water and apply directly to trunk from a distance of no more than 4 ft using low volume handgun or shielded spray equipment.

Do not allow spray to contact foliage or fruit. Up to 2 applications may be made with a minimum spray interval of 14 days between applications.

Restrictions:

- Treat only the lower 4 feet of the apple tree trunk.
- Do not make more than two applications per year for borer control.
- Do not apply when wind speed is greater than 10 mph.
- Do not apply within 28 days of harvest.

White latex paint brushed on the exposed portion of the rootstock will prevent new infestations of the borers, and also protect against southwest injury to the bark.

Other Sources of Information

Cornell has a great fact sheet on dogwood borers in fruit trees that can be found on their IPM web site at: http://www.nysipm.cornell.edu/factsheets/treefruit/pests/dwb/dgwdborer.html ❑

Strawberry Update

Peter Probasco, Salem County Agricultural Agent

Now that the season is over, it is time to renovate old fields and plan for ordering new plants or tips. In our variety trial we tested 23 varieties and Chandler was the leading variety in yield again. We have some experimental varieties that were close and hopefully they will be released soon. The Ovation variety is the best variety to add to the mix now so that you have some berries one week later. Ovation is a very good tasting variety and yields slightly less than Chandler. It makes a very big plant on plastic so I would space the plants 16 inches apart. That would require 14,520 plants/A on 5 ft. centers with double rows. When strawberry plants are too tight the fruit size can go down and you get more gray mold. Get your orders in for tips or plugs because the new varieties go fast. ❑

Timing Sprays for Flyspeck and Sooty Blotch

David A. Rosenberger, Ph.D., Extension Specialist in Plant Pathology, Cornell University, Highland, NY

Reprinted from Scaffolds Fruit Journal, June 20, 2005, Cornell University, NYAES

Flyspeck and **sooty blotch** infect apple fruit during summer and cause blemishes that can make fruit unmarketable. These diseases are caused by unrelated fungi, but both diseases are favored by extended periods of wet weather during mid- to late summer. Sooty blotch is easily suppressed by fungicides, but flyspeck is more difficult to control in northeastern United States. In abandoned or unsprayed trees, sooty blotch may appear on fruit before flyspeck does. However, flyspeck usually appears first in commercial orchards and causes more commercial losses than sooty blotch.

Most of the inoculum for sooty blotch and flyspeck comes from wild hosts in orchard perimeters. Ascospores of the flyspeck fungus mature in wild hosts shortly after apples begin bloom. Release of ascospores peaks about 10 days after petal fall. However, only a few ascospores land on apple fruit, and most of these are killed by fungicides used to control apple scab. Although ascospores do not play much of a role in commercial orchards, they are important because they initiate secondary infections in the border areas.

Brown and Sutton in North Carolina showed that flyspeck becomes visible on apple fruit only after fruit have been wet for a cumulative total of approximately 270 hr following infection. If we assume that flyspeck has a similar incubation period on wild hosts, then the primary infections initiated by ascospores will begin producing conidia on non-orchard hosts after approximately 270 hr of Accumulated Wetting counting from Petal Fall (hr-awpf).

The conidia produced on non-orchard hosts are continuously blown into apple orchards beginning at 270 hr-awpf, and these conidia cause the majority of infections that appear on apple fruit during late summer. However, another 270 hr of accumulated wetting are required before flyspeck becomes visible on apple fruit. Thus, most infections on fruit will become visible only after 540 hr-awpf.

Because flyspeck spores do not enter orchards in significant numbers until 270 hr-awpf, summer fungicides for controlling flyspeck are not needed during early summer. Furthermore, Topsin M, Flint, and Sovran (and probably Pristine) all provide post-infection activity that will eradicate flyspeck infections that have accumulated less than 100 hr of wetting after infection. Given that conidia begin blowing into orchards at 270 hr-awpf and that fungicides can provide post-infection activity through another 100 hr of wetting, summer fungicides should not be needed between the end of scab season and the time that the orchard reaches 370 hr-awpf. However, summer sprays probably should not be delayed beyond about 320 hr-awpf to allow for errors in measuring wetting periods and to ensure that a lengthy wetting period will not suddenly cause the 370 hr threshold to be exceeded.

In dry years, 320 hr-awpf may not occur until mid-August, but summer sprays should not be delayed beyond July 20-25 in New York State for two reasons. First, summer fungicides may be needed in late July to protect fruit against **black rot** and **white rot**, especially on cultivars that mature in late August or early September. Second, complete spray coverage becomes increasingly difficult as apples increase in size, especially on cultivars such as Redcort that tend to produce two short-stemmed fruit on a single cluster. Complete spray coverage also becomes more difficult as limbs bend downward under heavy crop loads.

In dry years, a single fungicide application in late July can sometimes provide adequate control of flyspeck for the whole season. Depending on a single application is risky, however, because effectiveness of a single spray depends on achieving perfect spray coverage. A safer approach in dry years is to use a minimum of two summer fungicide applications with one timed for mid- to late July and the second about three weeks later in early to mid-August. A slightly earlier timing may be advisable in orchards where poor pruning or an exceptionally heavy crop load make effective spray coverage impossible after mid-August. More than two applications will be needed in wet years when 320 hr-awpf is reached by late June.

Commercial losses to flyspeck usually occur when late summer rains remove fungicide protection from the "last spray" and then another 270 hr of accumulated wetting occurs prior to harvest. Under those conditions, flyspeck can suddenly appear on a high proportion of fruit within a few days.

As was seen in the 2004 trial, the critical decision for controlling flyspeck was deciding when to re-spray orchards after heavy rains in August and September. September of 2003 was one of the wettest Septembers on record at the Hudson Valley Lab, and we accumulated 270 hr wetting in just 25 days. Thus, one might assume that a "worst-case" rule of thumb would be to recover apples following heavy rains in late August or early September if fruit will remain on the tree for another 25 days, especially if the fruit are adjacent to a good inoculum source.

However, fungicides need not be re-applied immediately after a wash-off event in late August or early September because Topsin M, Sovran, and Flint will all provide post-infection activity covering up to 100 hr of

See Timing Sprays on page 5

Fruit IPM

Dean Polk, Fruit IPM Agent and David Schmitt and Eugene Rizio, Program Associates in Tree Fruit IPM

Peach

✔ **Oriental Fruit Moth (OFM):** The second brood is about 79% hatched in southern counties, and about 35% hatched in northern counties. Very little flagging from the first generation has been seen in southern counties, and trap counts remain lower than normal on most farms. Degree day spray timings are as follows for the second generation (northern counties), and the start of the third generation (southern counties), updated since last week:

	Application and Insecticide Type	
County Area	**Standard Insecticides**	**Intrepid**
Southern	Done, 3rd gen. sprays start about 7/23	Done, 3rd gen. sprays start about 7/21
Central	Done, 3rd gen. sprays start about 7/23	Done, 3rd gen. sprays start about 7/21
Northern	2nd trt 7/6-8; 3rd gen. sprays start about 7/29	Done, 3rd gen. sprays start about 7/27

✔ **Anthracnose:** This disease is not a regular problem, but has been seen during the past few years on Harrow Beauty, Sugar Giant, White Lady, and Klondike. It is the same disease that causes anthracnose on blueberries and bitter rot on apples. Captan and Ziram are two of the most effective anthracnose materials used on tree fruit. Since the mid-summer period just prior to ripening can be a critical period for anthracnose infection, keeping an effective material in the spray tank is recommended for at least the sensitive varieties.

✔ **San Jose Scale (SJS):** Crawlers are still present where scale is a problem pest. These should be targeted with an increased spray volume if at all possible. Be aware that Diazinon is limited to 12 #/ac per year, and has a 21 day PHI.

Apple

✔ **Codling Moth (CM):** Second generation CM adults should start to emerge in southern counties about 7/7. Therefore in southern counties, the time to treat for codling moth will be on or about 7/13. If using Assail, Calypso or Intrepid, applications need to go on 1-2 days earlier than if using standard OP's, carbamates or pyrethroids. Do not use trap counts as a guide for the second generation degree day timed spray. Treatments should be completed at the optimum timing with the correct rate and volume. After 2 complete CM treatments have been applied, then trap counts can be used as a guide to help determine the need for supplemental applications. The following chart updates timings outlined in last week's newsletter.

See IPM on page 5

Timing Sprays from page 4

accumulated wetting after the wash-off event. Given the scenario in 2004, that means that if trees had been resprayed any time before 7 Sept. (when hours of accumulated wetting reached 100), then flyspeck should have been controlled through September. If another storm had delivered 3 inches of rain on 30 Aug., then a grower who re-applied fungicides on 25 Aug might have needed yet another application in September to protect fruit through September whereas an application on 4 Sept. would have sufficed to eradicate infections from both the 20-22 Aug. and 25 Aug. rain events while at the same time providing protection on through September.

Conclusions: Control failures with flyspeck usually occur either because of poor spray coverage during the latter part of the growing season or because trees were left unprotected through more than 270 hr of wetting during the preharvest interval. Fungicide protection on fruit is exhausted after 2 inches of rain, so fungicide sprays may be needed in September if heavy rains occur with more than 25 days remaining before fruit will be harvested. ❑

	Application and Insecticide Type - 2nd Generation	
County Area	**OP's, Carbamates, Pyrethroids, Avaunt**	**Assail, Calypso and Intrepid**
Southern	7/13-14; 2nd application due about 7/25-7/27	7/11-12; 2nd application due 7/23-7/25
Central	7/15-16; 2nd application due 7/26-7/28	About 7/13-14; 2nd application due 7/24-7/25
Northern	About 7/18-19; 2nd application due 7/31-8/2	About 7/16-17; 2nd application due 7/29-7/31

IPM FROM PAGE 5

✔ **Summer Diseases – Sooty Blotch and Fly Speck, Rots:** In addition to white rot and black rot, these are critical diseases to control at this time. Topsin-M, Sovran or Flint can be included for control. Anthracnose can also be troublesome on apples (see peach section above), especially where much dead wood is present. Captan, Ziram and Flint are effective bitter rot materials. Good coverage and open canopies are essential for control.

Scouting Calendar

The following table is intended as an aid for orchard scouting. It should ***not*** be used to time pesticide applications. Median dates for pest events and crop phenology are displayed. These dates are compiled from observations made over the past 5-10 years in Gloucester County. Events in northern New Jersey should occur 7-10 days later.

Pest Event or Growth Stage	Approximate Date	2005 Observed Date
CM – 2nd generation 1250 DD Target	July 15 +/- 10 Days	

Note: the Blueberry Trap Counts for this week are not available.

Insect Trap Counts

Tree Fruit Southern Counties

Week ending	STLM	TABM-A	CM	AM	OFM-A	DWB	OFM-P	TABM-P	LPTB	PTB
6/05/05	18	11	2		6	6	2	15	80	2
6/11/05	25	22	2		3	5	1	29	60	2
6/17/05	585	31	4		2	25	2	32	93	8
6/24/05	1035	15	4		1	25	4	21	83	8
7/1/05	1236	10	1		2	4	2	10	81	4

Northern Counties

Week ending	STLM	TABM-A	CM	AM	OFM-A	DWB	OFM-P	TABM-P	LPTB	PTB
6/05/05	13	16	2		0		7	15		
6/11/05	13	21	6		0		14	21		
6/17/05	134	39	5		0		11	41		
6/24/05	214	17	2		0		6	28		
7/1/05	121	11	2		0		5	13	0	0

Key: STLM = Spotted Tentiform Leafminer, TABM = Tufted Apple Budmoth (A – apple, P – Peach), CM = Codling Moth, AM = Apple Maggot, OFM = Oriental Fruit Moth (A – apple, P – Peach), LPTB = Lesser Peachtree Borer, PTB = Peachtree Borer

Blueberry Trap Counts – Atlantic County

Week Ending	CBFW	RBLR	OBLR	SNLH	OB	BBM
6/4	7.6	0.7	0.3			
6/11	8.8	1.2	28	0.0	1.8	0.0
6/18	1.0	77.8	42.5	0.0	34.5	0.01
6/25	0.39	130.14	13.75	0.01	132.33	0.05

Blueberry Trap Counts – Burlington County

Week Ending	CBFW	RBLR	OBLR	SNLH	OB	BBM
6/4	2.6	0	0			
6/11	5.9	0.0	50	3.2	3.1	0.0
6/18	2.2	24.3	67.5	5.2	96.3	0.1
6/25	1.78	43.60	24.25	2.08	131.25	0.39

Key: CBFW = Cranberry Fruitworm, RBLR = Redbanded Leafroller, OBLR = Obliquebanded Leafroller, SNLH = Sharpnosed Leafhopper, OB = Oriental Beetle, BBM = Blueberry Maggot

NJ AGRICULTURAL EXPERIMENT STATION
RUTGERS
COOPERATIVE RESEARCH & EXTENSION
Plant & Pest Advisory
Rutgers' Cook College
18 College Farm Road
New Brunswick, N.J. 08901-8551

FIRST CLASS
POSTAGE PAID
PERMIT #576
MILLTOWN, NJ 08850

PLANT & PEST ADVISORY

FRUIT EDITION - CONTRIBUTORS

Rutgers Cooperative Extension Specialists and Program Associate
George Hamilton, Ph.D., Pest Management
Norman Lalancette, Ph.D., Plant Pathology
Bradley A. Majek, Ph.D., Weed Science
Peter W. Shearer, Ph.D., Entomology
Gail Lokaj, Program Associate in Pomology

NJAES/Cook College
Joseph Goffreda, Ph.D., Breeding

Rutgers Cooperative Extension Agricultural Agents and Program Associates
Atlantic County, Gary C. Pavlis, Ph.D. (609-625-0056)
Gloucester County, Jerome L. Frecon (856-307-6450)
Hunterdon County, Winfred P. Cowgill, Jr. (908-788-1338)
Morris County, Peter J. Nitzsche (973-285-8300)
Passaic, Elaine F. Barbour, Agric. Assistant (973-305-5742)
Warren County, William H. Tietjen (908-475-6505)
Fruit IPM, Dean Polk (609-758-7311)
Meredith Compton, Program Associate (908-788-1338)
Gene Rizio, Program Associate (856-566-2900)
David Schmitt, Program Associate (856-307-6450)

Newsletter Production
Jack Rabin, Associate Director for Farm Services, NJAES
Cindy Rovins, Agricultural Communications Editor

For back issues, visit our web site at: www.rce.rutgers.edu/pubs/plantandpestadvisory.

Pesticide User Responsibility: Use pesticides safely and follow instructions on labels. The pesticide user is reponsible for proper use, storage and disposal, residues on crops, and damage caused by drift. For specific labels, special local-needs label 24(c) registration, or section 18 exemption, contact RCRE in your County.

Use of Trade Names: No discrimination or endorsement is intended in the use of trade names in this publication. In some instances a compound may be sold under different trade names and may vary as to label clearances.