scaffolds Update on Pest Management and Crop Development

FRUIT JOURNAL

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INSECTS

CODLING MOTH MODEL

(Art Agnello and Harvey Reissig, Entomology, Geneva)

❖❖ The developmental model for 2nd generation codling moth larvae predicts that a control spray should be applied in problem orchards 1260 DD (base 50°F) after the start of the FIRST flight (5/17 in Geneva, 5/15 in the Hudson Valley). As of today, 7/17, 1109 DD have accumulated in Geneva and 1246 at Highland.

Codling moth (CM) overwinters as a larva in a cocoon under loose bark on the tree trunk. Adults emerge during bloom, and the first flight continues until about 30 days past petal fall. Eggs, laid singly on the upper surface of leaves or fruit, start to hatch at petal fall and continue for two to three weeks. Larvae feed only on fruit. Surface bites, referred to as stings, cause blemishes; deeper injuries are caused by feeding inside the fruit. Fruits injured by extensive internal feeding usually drop in the middle of June at which time early-season damage becomes noticeable. Adults from the second or summer generation of CM start to fly about mid-July, and the peak flight in western New York occurs around the first week in August. Larvae from this generation are active in fruit throughout August. Fruit damage by the second generation is generally more serious than that of the first.

Adult males can be captured in pheromone traps, but numbers of males captured in these traps cannot be related to potential fruit damage. Thus pheromone traps are used only to monitor the seasonal activity patterns of adults within an area. Developmental models, based on temperature accumulations after the first catch of males, can be used to predict the first egg hatch of CM; this approach is commonly used to time initial control sprays for CM in the western United States. It is not practical to monitor commercial apple orchards for CM eggs or larval fruit entries because of the theoretical zero tolerance for internal fruit damage.

The codling moth is attacked by both parasites and predators, but these natural enemies cannot effectively control this pest in commercial orchards. To kill the larvae before they enter the fruit, chemical sprays for CM must be initiated before eggs hatch. In New York, the first generation of CM is normally controlled by sprays for plum curculio at petal fall so special sprays are not necessary. CM is most effectively controlled by the same conventional insecticides used against the plum curculio (organophosphates and synthetic pyrethroids). CM can also be controlled by biorational pesticides such as bacteria (*Bacillus thuringiensis*), insect growth regulators, viruses, and botanicals, although many of these products are less effective than standard insecticides. In New York, the second generation of CM is normally controlled by the same conventional insecticides used on apple maggot so no special sprays are required in most commercial orchards. However, in cases where summer organophosphate sprays have been withheld for more than one season because of low apple maggot pressure, there is a danger that CM will re-establish itself as a primary cause of fruit damage. In these cases, growers should apply preventive pesticide sprays according to the developmental model.❖❖

DISEASES

CAUSE AND EFFECT

SUMMER SPRAYS AND STORAGE DECAYS: IS THERE A RELATIONSHIP?

(Dave Rosenberger, Plant Pathology, Highland)

❖❖Over the past several years, various apple storage operators in western New York have complained about unacceptable rates of postharvest decay in apples coming out of CA storage after February or early March. The decay problem has been especially severe with Empire fruit. Some storage operators have reverted to applying postharvest fungicides on Empire, even though we do not feel that postharvest treatment should be necessary for this cultivar. At least one storage operator believes that postharvest treatment has reduced, but not cured, the postharvest decay problem in his storage. A curious aspect of this storage decay problem is that the incidence of decay in Empire coming out of long-term CA storage appears to be considerably greater in western New York than in the Hudson Valley.

Last winter we collected approximately 100 decayed fruit from each of two large storages in western NY and made isolations from the fruit to determine the cause of the decays. We found that the decays were caused by a surprisingly diverse group of fungi. As one might expect, the common postharvest pathogens, *Penicillium* species and *Botrytis*, were present in some fruit. However, we also found numerous decays caused by *Botryosphaeria* (black rot), *Phomopsis*, and *Colletotrichum* (bitter rot). These latter decays probably originated in the field, remained quiescent (perhaps in lenticels) until the fruit reached a fully mature stage, then invaded the fruit and caused decays. The presence of these decay fungi in stored apples suggests to me that affected fruit may have received an inadequate summer spray program. This hypothesis is supported by the fact that postharvest decays are less severe in the Hudson Valley where growers are forced to apply more summer fungicides to protect fruit from sooty blotch and flyspeck.

More research is needed to prove the hypothesis that lack of summer fungicides is contributing to postharvest decay problems in western New York, and also to determine if there is a critical timing for sprays that suppress postharvest decays. For the moment, the best I can do is speculate that two end-of-the season fungicide sprays might significantly reduce the amount of postharvest decay that is occurring in problem blocks of Empire. I would suggest that Benlate (3 oz/100) plus Captan (1 lb of 50W/100) be applied in late July and again in mid-August. If more than four inches of rain occurs between the mid-August application and the first of September, then a third fungicide application should be made just before Labor Day for any fruit that will be harvested after September 20. Good spray coverage is essential to maximizing the effectiveness of these late-season sprays.

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Benlate applied in late summer will provide better residual protection than any other fungicide. Benlate also has the advantage of being absorbed into the cuticle, so it may have limited eradicant activity against some of the quiescent infections that might have been initiated earlier in the summer. However, Benlate may also contribute to a build-up of late-season mites in some years. In a three-year trial where Benlate-Captan summer sprays were applied three or four times to the same plots each year, we noted a significant flaring of red mites only in the third year of the experiment. However, that year we would have needed a miticide in the Benlate-Captan plots whereas other plots sprayed with only Captan did not require a miticide. Where integrated mite control is working, growers may wish to avoid Benlate and stick with Captan sprays. However, because Captan has a shorter residual, I believe that Empire blocks where postharvest decays have been a problem should receive their last captan application around September 1st to ensure that fruit are protected up until harvest.❖❖

FIELD DAY!

N.Y. FRUIT PEST CONTROL FIELD DAY

❖❖ This annual (in Geneva at least) event, sponsored by the Departments of Plant Pathology and Entomology, has been scheduled for September 6–7 this year. All those interested are invited to attend this preliminary presentation of results of field trials on the control of diseases and insects attacking N.Y. fruit crops. Results will be discussed from experiments on tree fruits and grapes.

In Highland, we anticipate hosting our Fall Fruit Tour of Agrichemical Research plots on the Wednesday after Labor Day, September 6, from 9:00 AM until noon. In the Hudson Valley, the fall fruit tour is being held only on alternate years. Thus, although there was not a fall tour here last year, we do plan to host it this year. Registration begins at 8:30 at the Hudson Valley Laboratory in Highland (Wednesday, September 6) and at Barton Laboratory, NYSAES, Geneva (Thursday, September 7).❖❖

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva NY

	7/10	7/13	7/17
Redbanded leafroller	0.1	0.2	0.3
Spotted tentiform leafminer	261	405	599
Oriental fruit moth (apple)	3.4	1.8	1.9
Lesser appleworm	6.1	2.2	0.9
Codling moth	3.5	0.8	2.9
San Jose scale	0.3	0.3	9.0
American plum borer	1.5	2.0	1.9
Lesser peachtree borer (peach)	1.1	3.3	2.9
Lesser peachtree borer (cherry)	1.5	3.2	3.4
Peachtree borer	0.8	2.5	1.9
Obliquebeanded leafroller	0	0	0.1
Pandemis leafroller	0	0	0
Apple maggot	0	0.2	1.1

* = 1st catch

HVL, Highland NY

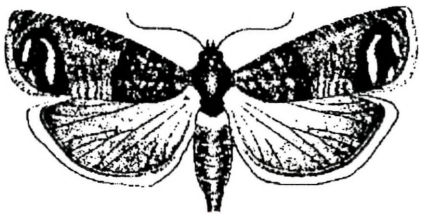
	7/3	7/10	7/17
Redbanded Leafroller	0	1.6	1.6
Spotted tentiform leafminer	2.6	24.9	35.9
Oriental fruit moth	0.6	1.4	0.9
Fruittree leafroller	0.3	0	0.1
Codling moth	0.8	0.4	0.6
Lesser appleworm	0	0	0
Sparganothis fruitworm	3.8	1.1	0.6
Tufted apple bud moth	2.8	0.1	0.4
Variegated leafroller	-	0	0.1
Obliquebanded leafroller	7.2	0.9	0.1
Apple maggot	0	0	0

(Dick Straub, Peter Jentsch)

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1 – 7/17):	1872	1324
(Highland 3/1 – 7/17):	2005	1339

Coming Events:	**Ranges:**	
Spotted tentiform leafminer 2nd flight peak	1295–1979	854–1355
Spotted tentiform leafminer 2nd gen. tissue feeders present	1504–2086	952–1201
San Jose scale 2nd flight peak	2136–2533	1567–1818
Codling moth 2nd flight begins	1417–2302	999–1549
Apple maggot 1st oviposition	1566–1724	1001–1232
Comstock mealybug 2nd gen. crawlers emerging	2106–2768	1447–1924
Lesser peachtree borer flight peak	1099–2330	667–1526
Peachtree borer flight peak	869–2241	506–1494
Redbanded leafroller 2nd flight peak	1479–2443	952–1698
American plum borer 2nd flight peak	1975–2612	1407–1840
Obliquebanded leafroller 1st flight subsides	1420–2277	899–1546



PEST FOCUS

Geneva: **Spotted tentiform leafminer** 2nd generation sapfeeding mines were found in Geneva on 7/11. Sampling for STLM sapfeeding mines should commence at 690 DD (base 43). DD43 since start of STLM 2nd flight (6/19) now = **854**. **San Jose scale** adult catch increasing. **Apple maggot** catch increasing

Highland: **Spotted tentiform leafminer** 2nd flight began 6/12. DD (base 43) since 1st catch = **1005**.

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