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Weekly Update on Pest and Crop Development

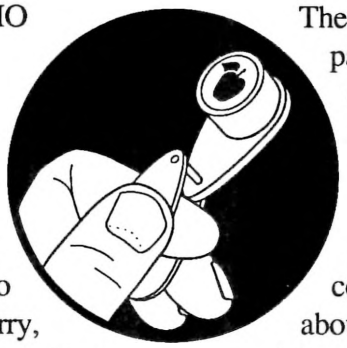
F R U I T J O U R N A L

May 18, 1992 VOLUME 1 Geneva, NY

INSECTS

APPLES

PLUM CURCULIO
(Art Agnello)



❖❖ The first internal fruit feeder to show up during the season is a snout weevil that is a common pest in nearly all commercial apple orchards, although it also attacks plum, nectarine, apricot, cherry, peach, pear, and quince. Its native host plants are Canada plum (*Prunus nigra*), wild plum (*P. americana*), and *P. mexicana*. The adults hibernate under debris on the ground in orchards and in adjoining woods and hedgerows, and begin migrating to apple trees during the blossom period. The beetles feed on and oviposit in the fruit as soon as it starts to form, continuing until the apples are about 1.5 inches in diameter. The larvae mature readily in fruit that falls to the ground in June and July; they usually cannot complete development in fruits that remain on the tree until harvest. Pupation takes place underground, and the new generation of beetles emerges from the soil in August. These new adults feed on fruit for a short time and then find suitable overwintering sites in or near the orchard. There is only one brood per year in N.Y. Infestations are usually most severe at the margins of the orchards. In large, cultivated plantings, almost all the damage may be limited to the 3 or 4 outer rows. Crop size apparently has little influence on the infestation rate of individual trees. The current control strategy is treatment with an organophosphate insecticide at petal fall and the first cover spray in western N.Y., and at petal fall plus the first and second cover sprays in eastern N.Y. Harvey Reissig and Jan Nyrop will be continuing their field tests on oviposition this year, to find out whether the egg-laying period can be defined in terms of the always variable postbloom weather patterns, especially regarding degree-day accumulations.

The beetle's biology is not known exactly, particularly during the critical spring emergence and migration periods. Studies more than 50 years ago established a temperature threshold of activity of about 55°F, and first migration to host trees at 75°F for several consecutive days. A remarkable point about this event is that 40-66% of the total adult emergence generally occurs on a single day, but the timing of this activity has always been uncertain. It was previously proposed that mass emergence is correlated with McIntosh bloom, but data over a number of years show this relation to be imprecise. Air and soil temperatures play a large part, but humidity levels are also important. The beetles tend to avoid low humidity, because the newly emerged adults are very susceptible to water loss. There is a lag period of 1-2 weeks between the mass emergence and their appearance in the host trees, which takes place gradually. The beetles continue to appear in the trees for several weeks, and usually reach a peak 1-2 weeks after petal fall. The timing is uncertain, but it is agreed that beetles first appear in host trees following several days of either a mean temperature of 60°F or above, or a maximum of 75°F or above. They do not occupy the trees continuously even after favorable conditions have been met, but leave under adverse changes in the weather, such as low night temperatures, or cold wind and rain. Guthion, Imidan, Lorsban, and all pyrethroid insecticides are effective at controlling plum curculio. These materials will also control codling moth later on.❖❖

GREEN FRUITWORM (GFW)
(Art Agnello)

❖❖ This is a collective common name used in N.Y. to refer to a number of Lepidoptera, but one of the

more common members of this group is the speckled green fruitworm, *Orthosia hibisci.* Traditionally, orchards in eastern N.Y., particularly the Hudson Valley, have had greater problems with GFW than those in the western part of the state. The GFW has a single generation per year and overwinters in the pupalstage in the soil. Adult emergence begins at about green tip and is complete by the pink stage of McIntosh apples. The adults are about 2/3 of an inch long, and are grayish-pink in color with two purplish-gray spots on the forewings. Egg laying begins at about half-inch green. Eggs are laid singly or in pairs. They are white to grayish in color and have ridges radiating from the center.

GFW larvae begin hatching between tight cluster and pink. The larvae feed on new leaves, flowers, and developing fruit. Fruit feeding is normally restricted to larger larvae. The larvae mature between late May and late June, at which time they drop to the ground and pupate in the soil at a depth of 2 to 4 inches. In the past, sprays were applied at pink and petal fall to control the GFW. However, research has indicated that a single spray at petal fall provides comparable control to the two-spray program. Monitoring for the GFW is the same as monitoring for the obliquebanded leafroller, which should take place during the late bloom stage, and both species may be considered together in making a control decision. Also, the pesticides recommended for control of this caterpillar are the same as for OBLR: Lorsban, Lannate, Asana, and B.t. products such as Dipel, Javelin, or Biobit.❖❖

EUROPEAN APPLE SAWFLY (EAS)
(Art Agnello)

❖❖ This insect was first discovered in the United States on Long Island in 1939. In New York, its distribution is restricted to the Hudson Valley and the Champlain Valley. Although the EAS is not a serious pest of all commercial orchards, it has persisted as a problem in certain localized areas, and its incidence appears to be growing. The EAS overwinters as a mature larva within the soil. Pupation occurs in the early spring and adults normally begin emerging by bloom. During cool, cloudy weather the adults are inactive. Although they will mate and lay eggs at temperatures below 60°F, higher temperatures combined wth sunny days favor EAS activity. Egg laying normally begins during bloom and may continue for 20 days. The eggs are laid within the calyx cup and the hatching larvae burrow directly into the fruit. The larvae feed directly beneath the fruit surface and cause the typical spiralling scar seen at harvest. The larvae can continue to develop on the initially infested fruit or may move to a second fruit to continue development. The larger larvae bore into the center of the fruit and cause it to drop. The mature larvae leave the fruit and enter the soil, where they remain until pupation the following spring.

An effective monitoring strategy for the EAS to determine control need has yet to be developed, although we do offer some suggested guidelines using white sticky board traps: treatment is probably warranted upon capture of 3 adults per trap by the time of 90% petal fall, if no insecticide was applied at pink, or of 6 adults per trap if one was applied. One of the difficulties is that the best time to control the EAS is when the adults emerge during bloom, a period when insecticides cannot be applied. This undoubtedly is why the EAS persists as a pest. The petal fall sprays applied to control such pests as the plum curculio and the early Lepidoptera do aid in controlling the EAS and maintaining its status at a low level.❖❖

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APPLE REDBUG
(Art Agnello)

❖❖ A number of reports from area orchards have been received in past years, noting fruit damage characteristic of this small (about 1/4" long when full grown), very active, tomato-red bug. This is an old pest, not commonly seen in the state. Its injury in western N.Y. has been known since 1896; Ralph Dean and Paul Chapman did extensive research on it in the Hudson Valley and western N.Y. from 1932-44. The apple redbug is widely distributed, but varies greatly in abundance from place to place; its original host is wild crabapple (*Pyrus* sp.). Commercially, Rome & Red Delicious apples have been reported as less susceptible, with Rhode Island Greening, Northern Spy & McIntosh more susceptible to its attacks. The redbug has a single generation per year; it overwinters as an egg, and development from egg to adult requires 5-6 weeks, at a rate that is extremely temperature-dependent. Most eggs are deposited in the wood of the current season's growth, usually in smaller branches and watersprouts, and hatch from late April or early May (pink stage of McIntosh) until full bloom. The adults appear 3-5 weeks after petal fall, depending on the weather; the length of the adult stage is probably 25-35 days, with a pre-oviposition period of approximately 10 days.

Injury is caused by feeding of nymphs and adults on fruit and foliage; newly-hatched bugs seek out opening leaf buds and work their way down between unfolding leaves to feed on tender growing tissues; twig terminals are favored locations. As the bug feeds on foliage, a salivary secretion is introduced that forms a bright reddish dot (giving the leaf a spotted appearance) and later turns brown when the affected area dies. This can leave small, irregular holes in leaves. Fruit feeding starts about the time the apples are 1/4" in diameter. This first causes brown spots on the surface that have a "water-soaked" appearance; later, shallow cankers with rough surfaces develop in the skin. Evidence has never been found that redbug injury causes McIntosh fruits to drop. Damage on more mature fruits takes the form of brown, russetted areas with distinct margins, varying in size from small round spots to irregular areas covering more than half the fruit. In severe cases, this is accompanied by gnarling resulting from the suppression of growth of tissues around the feeding punctures. Another form of damage is an irregular, continuous surface russetting, not depressed or deforming the fruit. In general, fruit seems not to be preferred over foliage as a food source. Rather, the insects "happen upon" it in the course of their feeding; succulence of vegetative growth probably influences the relative levels of fruit injury in a given season. This pest exhibits little tendency to spread from one orchard to another.

For control, oil can be used in the dormant to delayed dormant stages to kill the eggs, but satisfactory control requires rather higher rates than are commonly used: 4% during the dormant stage, and 3% at delayed dormant (green tip to half-inch green). Contact insecticides should be applied at petal fall; pink applications are not effective, as hatch is not yet complete. Extensive feeding on fruit generally begins 10-15 days after petal fall; for adequate control, treatment is recommended within 5-6 days after petal fall. Monitoring for the nymphs can give an indication of potential problems; look in the fruit clusters during the bloom-to-petal fall period (while sampling for OBLR), especially in blossom/fruit stem axils and on leaf undersides. No exact threshold has been established, but 1-2 nymphs per cluster have caused problems in some of the Geneva orchards in recent years.❖❖

PEARS

COMSTOCK MEALYBUG
(Art Agnello)

❖❖ From our past field trials, we have the following guidelines for control of this insect in pears (and apples):

- The preferred timing for control of the 1st brood of crawlers is at petal fall; for the 2nd, during the first week in August in western N.Y., and 10-14 days EARLIER in eastern N.Y. (as determined by monitoring migration with tape traps, which we'll do again this year).

continued...

- The best materials we have tested are Penncap-M, Lannate, and Diazinon; their ranking varied from one location to the next, and according to use pattern and population pressure. Penncap-M is probably the most economical. Lorsban is the best of all for apple infestations, but is not registered for postbloom use in pears.

- Generally speaking, back-to-back sprays against 2nd brood resulted in lower fruit infestations than 2 sprays against the 1st, or a single spray against each brood.

- In orchards with serious population pressure, more than 2 mealybug treatments may be required to assure a reduction of infestations to commercially acceptable levels, and the first year of such treatments in a heavily infested block may still not do a tremendous job. This is a pest that requires yearly attention before you start getting good results.

- Bear in mind that Lannate's use on pears is restricted by label to a single application per season, so it might be advisable to "save" it for the 2nd brood spray, when it seems to be most effective. The DEC has granted us a 2(ee) permit to apply Lannate for mealybug, at 1 lb/100 gallons. Diazinon 50WP is labeled at 1 lb/100 gal in up to 3 cover sprays, and Penncap-M is labeled at 2 pt/100 gal, which is also a 2(ee) use. Last season, all of these materials except Lannate were unacceptable to many processors for their fruit products. We have seen letters from some of these companies indicating that some materials, such as Penncap-M, are generally more allowable this year. Be sure to check with your intended buyer's guidelines before making a spray decision. For situations where methyl parathion and diazinon are still not acceptable, the only mealybug control option is to apply a single Lannate spray when it will do the most good. We would advise during peak 2nd brood crawler activity in August, and will let you know when that occurs.❖❖

PEAR RUST MITE
(Art Agnello)

❖❖ This occasionally serious pest of fresh market pears gives a number of growers problems each year. *Pear rust mite* outbreaks may be worse in areas receiving extensive sprays of materials destructive to predators, and the development of miticide-resistant strains are suspected in some cases. Scouts and growers have difficulty in detecting the presence of these pests until after they have already damaged the crop because of their minute size. The overwintering stage is a light brown, wedge-shaped adult, which is nearly invisible without a 15X hand lens; these mites settle in any protected area on the trees, such as behind leaf buds, especially on wood 1 or 2 years old. The mites become active as tree growth starts in the spring, and feed upon the first green tissue at the bud base, later moving to the foliage or fruit. The summer forms are nearly white in color, and even smaller than the overwintered adults. The more tender foliage is preferred, so populations on leaves decrease as the leaves mature and toughen. Damaging populations sometimes develop on the fruit soon after petal fall, sheltered in the hairs around the calyx and remaining active for a few weeks, until sometime in mid-July when they appear to leave the fruit.

Mite feeding causes leaves to turn brown or bronze, which may stunt the growth of young trees; on older trees the damage to fruit is far more significant. Severe russetting of the fruit can leave the entire surface rough and brown, which alters or destroys the desirable varietal skin appearance. Early in the growing season, mite feeding at the calyx or stem ends gives a localized russetting to those areas. If mite growth is unchecked, this feeding and russetting may spread over the fruit entirely, depending on the population numbers and the length of their feeding period. Monitoring guidelines tend to be pretty complicated, but one rule of thumb is a 2-3% fruit infestation rate for fresh market pears; also, a spray should be applied if any pears contain 30 or more rust mites. If levels on individual fruits do not exceed 10 mites, there is generally a grace period of about 2 weeks within which a spray could be applied. A miticide such as Kelthane or Carzol should be used at petal fall if any of these thresholds are reached, but frankly, a preventive petal fall spray is probably the most advisable course of action in blocks with a history of rust mite infestations. Those growers electing to use Agri-Mek within the 7-14-day post-petal fall time period advised will probably realize some added rust mite control from that spray. The effectiveness of summer sprays in N.Y. is questionable.❖❖

FIELD NOTES

Hudson Valley Lab, Highland (Dave Rosenberger, Dick Straub):

Tree Phenologies - Apple full bloom dates:

McIntosh	May 12-13
Golden Delicious	May 14
Rome Beauty	May 15

May 18 - McIntosh Petal Fall, Empire 90% PF
Pears Petal Fall

As of May 14, petals were beginning to fall on early apple cultivars. Most cultivars had a heavy and uniform bloom except that Delicious trees were noted to have sub-optimal bloom in some locations. There was excellent pollinating weather for apples and pears. Good pollination was further ensured by having most cultivars in bloom at the same time.

Apple scab ascospore maturity, Highland, NY, from leaves collected May 14:

Immature	Mature	Discharged	Tower shoot
30%	42%	28%	>1000 spores

A large number of scab spores are ready to go with the next rain. The last significant infection period was April 24 when trees were at half-inch to three-quarter-inch green. Scab lesions resulting from that infection period appeared on unsprayed trees May 11. We had a light Mill's infection period on May 2 and another on May 8, but both of these wetting periods started after 9:30 PM. Most ascospores are released after daybreak. If the night-time hours are subtracted from the wetting periods of May 2 and May 8, neither of them would be scab infection periods.

DISEASES

Based on weather conditions from the Hudson Valley Lab and predictions from the MaryBlyt model, we had our first fire blight infection period on May 13. This was the first day that the epiphytic infection potential (the predicted bacterial populations on flowers) reached threshold levels. A trace of rain between 6:00 and 8:00 AM on May 13 provided adequate wetting for an infection period. Growers with orchards that had fire blight either of the last two years should be using streptomycin sprays to protect against blossom blight.

UPDATE ON MARYBLYT PREDICTIONS FOR HUDSON VALLEY

Following are the MaryBlyt predictions for fire bight starting with the first bloom on 5/5 using weather conditions from HVL. Note that ratings are represented by + or - indicators for 4 factors. The 1st column represents presence of open flowers. The 2nd column represents wetting conditions (rain or dew). The 3rd column represents mean daily temperature and is positive for days when the mean temperature is over 60°F. The 4th column represents the "epiphytic infection potential" and is positive for those days when there has been enough accumulation of degree-hours over 65°F to allow bacterial populations to reach levels where infection could occur. When the model shows one, two, three, or four columns positive, it predicts low, moderate, and high risk, and infection, respectively. The model suggests that streptomycin should be applied just before or immediately after days with either high risk or with an infection unless streptomycin was applied in either of the two previous days.

The period represented by each date below is from 9:00 AM EDT of the previous day to 9:00 AM EDT of the date indicated.

	Temp		Columns for		Strep Spray
Date	Max	Min	4 Factors	Prediction	Recommended.
May 5	57	42	+ - + -	Moderate	
May 6	51	41	+ - + -	Moderate	
May 7	58	36	+ - - -	Low	
May 8	64	44	+ - - -	Low	
May 9	64	55	+ - + -	Moderate	
May 10	71	51	+ - - +	Moderate	
May 11	69	52	+ - - +	Moderate	
May 12	74	39	+ - - -	Low	
May 13	78	59	+ + + +	Infection	YES
May 14	76	57	+ + - +	High	
May 15	72	53	+ + - +	High	
May 16	74	54	+ + + +	Infection	YES
May 17	58	47	+ + + -	High	
May 18	69	54	+ + + +	Infection	

❖❖ Now is the peak period for discharge of black knot spores. Plum growers should be sure to maintain a good protectant fungicide cover in plum plantings. Funginex and Nova used for brown rot will not provide protection against black knot. Bravo or combinations of Benlate or Topsin M plus captan are probably the most effective chemical controls for black knot. None of the fungicides will be effective in orchards where visible black knots are present in the trees at this time of year.❖❖

PHEROMONE TRAP CATCHES

Number/Trap/Day, Geneva NY

	5/7	5/11	5/14	5/18
Green Fruitworm	0	0	0	0
Redbanded Leafroller	3.3	22.4	14.5	2.8
Spotted Tentiform Leafminer	713	881	1080	373
Oriental Fruit Moth (apple)	0	39.6	130	72.8
Oriental Fruit Moth (peach)	0	0.1	1.2	0.3
Lesser Appleworm	0	1.0	0.5	0.1
Codling Moth	0	0	0	2.0

Total Number, HVL, Highland NY

	5/11	5/14	5/18
Spotted Tentiform Leafminer	72	83	29
Redbanded Leafroller	7	4	9
Oriental Fruit Moth	48	0	3
Codling Moth	0	1	3

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1-5/18):	394	201

Coming Events:	Ranges:	
European red mite hatch complete	361-418	183-210
European red mite 1st summer eggs	448-559	235-320
Oriental fruit moth 1st flight peak	351-606	165-298
Plum curculio oviposition scars present	448-670	232-348
Pear psylla hardshells to adults present	437-577	235-309
Redbanded leafroller 1st flight subsides	518-876	255-523
Strawberry bud weevil 1st clipped buds	365-627	124-190
Spotted tentiform leafminer 1st mines forming	402-635	140-366
Spotted tentiform leafminer 1st flight subsides	489-839	270-523
Apples (McIntosh) at petal fall	418-518	210-287
Pears at fruit set	470-562	251-287
Sweet cherries at fruit set	409-518	209-287
Tart cherries at petal fall	425-518	216-287

Note: For current information in your area of the state, check PEST STATUS under FRUIT on CENET.

PHENOLOGIES (Geneva)

Apple (McIntosh): bloom
Pear, Tart Cherry: bloom/petal fall
Sweet Cherry, Plum, Peach: petal fall

PEST FOCUS

May 8 - 1st predator mite, Geneva (C. Smith)
May 12 - 1st ERM nymph, Geneva (H. Reissig)
1st WALH nymph, Geneva (J. Kovach)
Strawberry Clipper adult & clipped buds, Tioga Co. (G. Sheffield)

NOTE: Every effort has been made to provide correct, complete and up-to-date pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly, and human errors are possible. These recommendations are not a substitute for pesticide labelling. Please read the label before applying any pesticide.

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