scaffolds FRUIT JOURNAL

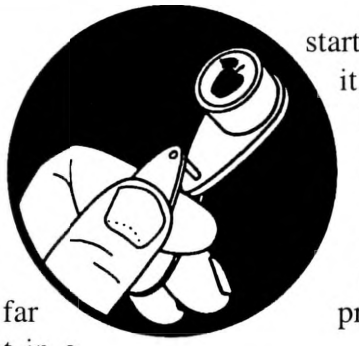
Update on Pest Management and Crop Development

April 23, 2001 VOLUME 10, No. 6 Geneva, NY

CHEM NEWS

GIVE IT A WHIRL

FAR OUT! (Jim Schupp, Horticultural Sciences, Highland)



❖❖ **Apogee** (<Greek.> *apo-* far from + *gaia-* earth). 1. The point in a satellite's orbit that is highest or furthest from the earth. 2. A new plant growth regulator for apples that has just been registered for use in New York State.

Apogee plant growth regulator for apples has been registered for use in New York for the 2001 season. Apogee blocks the synthesis of gibberellins, the naturally occurring plant growth substances that promote shoot elongation. When Apogee is applied, the actively growing shoots on the apple tree slow down over the following 10–14 days, then stop elongating altogether. The result is shorter shoots with fewer leaves. This arrested growth lasts for three to six weeks, depending upon the dose used, and the natural vigor of the tree. By making one or two repeat applications of Apogee, you can control growth for the entire season, under New York growing conditions.

Reducing shoot growth increases the penetration of sunlight to the interior of the tree canopy, improving fruit color and fruit quality. Dormant pruning time is reduced by 40–50%, and the need for summer pruning may be eliminated. Treatment with Apogee also reduces the severity of the shoot blight phase of fire blight.

Over the next three issues of Scaffolds, we will cover the keys to success with Apogee, starting with the decision of where to use it, then discuss rates and timing, followed by application advice. The goal of these articles is to enable growers to make informed decisions and to get optimal cost-effective performance from this exciting new product.

Where to use it?

In relation to tree vigor and tree size: If orchard vigor is low, shoot length will be short and there is little reason to apply Apogee. Apogee will be very beneficial in those orchards with average vigor, where annual terminal growth is 18–24 inches. Blocks with excessive vigor, especially those where the combination of close tree spacing and high vigor creates overcrowd-

continued...

IN THIS ISSUE...

ing, are great candidates for Apogee.

Apogee will probably provide the greatest amount of economic benefit in vigorous semi-dwarf and dwarf orchards. Yes, Apogee will reduce growth and pruning time for trees on standard rootstock, but one is still left with total canopy volume that is too large for optimal fruit color. It will also take more Apogee per acre to effectively treat larger trees, resulting in greater cost per acre.

In relation to pruning: Apogee will reduce pruning time, but it will not replace annual dormant pruning. It will provide the greatest benefits on trees that have been dormant pruned. There are some benefits from pruning that Apogee will not provide.

Dormant pruning removes damaged and diseased limbs and maintains the proper canopy shape by eliminating limbs that have grown too large for their position in the canopy. Pruning reduces the number of spurs and the number of growing points, and so it is important for maintaining a healthy balance between growth and fruiting. Renewal pruning selectively removes older, less productive wood, and stimulates new branches with younger, more productive spurs. Pruning is a fruit grower's first crack at thinning too. Removing competing fruiting spurs and their potential fruits increases fruit size and quality. In short, Apogee is a new tool to help the professional grower do a better job of canopy management with reduced labor, not a crutch for poor management practices!

In relation to varieties: Apogee has been effective on all the varieties tested, including most if not all of the commercially important ones. McIntosh is perhaps the toughest variety to manage with Apogee, but even Mac can be tamed with timely sprays and good coverage. Vigorous, blight-susceptible varieties such as Gala, Gingergold, and Fuji should be right at the top of the list for Apogee.

Apogee applications have caused fruit spotting/corking and cracking on Empire in some trials. For 2001, the Apogee label will carry a caution statement to advise growers about the possibility of cracking on Empire and Stayman. This damage doesn't always occur, and researchers are actively searching for the cause and its cure.

I'm not sure Empire needs Apogee. Empire is a relatively low vigor cultivar, so I see the primary benefit of Apogee to Empire as eliminating summer pruning to improve fruit color. The damage has been observed in NY in wet, cloudy years (1998 and 2000), but not in a dry sunny year (1999). It's possible that this problem is worse with poor drying conditions, so that may also be a factor for growers to consider.

Should you use it this season? In many orchard blocks, Apogee would increase fruit color and reduce growing costs. I would encourage growers to try Apogee in a few such blocks, and to leave check trees to allow a firsthand comparison. High levels of fire blight inoculum are present in some orchards; so using Apogee to supplement streptomycin sprays in these orchards will make a lot of sense if the weather favors fire blight infection during bloom.

continued...

scaffolds

is published weekly from March to September by Cornell University—NYS Agricultural Experiment Station (Geneva) and Ithaca—with the assistance of Cornell Cooperative Extension. New York field reports welcomed. Send submissions by 3 pm Monday to:

scaffolds FRUIT JOURNAL
Dept. of Entomology
NYSAES, Barton Laboratory
Geneva, NY 14456-0462
Phone: 315-787-2341 FAX: 315-787-2326
E-mail: ama4@nysaes.cornell.edu
Editors: A. Agnello, D. Kain

This newsletter available on CENET at: news://newsstand.cce.cornell.edu/cce.ag.tree-fruit
and on the World Wide Web at:
http://www.nysaes.cornell.edu/ent/scaffolds/
For fruit information on the web see:
http://www.cornellfruit.com

Apogee may eliminate the need for summer pruning, and our studies show it reduces dormant pruning by 40–50%. Since pruning is one of the largest labor expenses in apple growing, the pruning labor that can be saved with Apogee justifies the expense of this product in many orchards. Each block has different pruning requirements based on tree size and vigor, so I encourage growers to use the estimated 40–50% savings to identify those blocks where Apogee will give them the most benefit.

Next installment: *Rates, timing, and scheduling*❖❖

DISEASES

THE MUMMY'S CURSE

BROWN ROT OF STONE FRUIT
(Bill Turechek & Cathy Heidenreich, Plant Pathology, Geneva)

Introduction

Brown rot, caused by the fungus *Monilinia fructicola*, is a major disease of peaches, cherries, plums, prunes, nectarines, and apricots. The fungus can infect the blossoms, immature and mature fruit, spurs, and small branches. Complete crop loss can occur if weather conditions favor disease development and fungicide protection is lacking during bloom and just before ripening. Additional losses are possible in storage if fruit are not handled properly during harvest.

Symptoms on blossoms, twigs, and fruit

Disease symptoms are similar on all stone fruit. Infected flowers turn brown, wither, and either become fixed to twigs as a gummy mass or drop like unpollinated flowers. In order of susceptibility, apricot is most susceptible to blossom blight, followed by prune, sweet cherry, peach, sour cherry, and then plum. If infected blossoms do not drop off, the fungus may grow through the pedicel (flower stem) into the twig below, causing twig infections. Twigs develop elliptical to fusoid cankers with profuse gumming at the margin between diseased and healthy tissue. Leaves on infected shoots turn brown and wither, but remain attached. In some instances, twigs are girdled and killed.

On the fruit, brown rot infections first appear as soft brown spots. These rapidly expand and become covered with powdery masses of tan spores (called conidia). Infections may spread rapidly from fruit to fruit, particularly if environmental conditions are favorable and the fruit are touching one another. Under optimum conditions, an entire fruit may be rotted in 48 hrs! All stone fruits become increasingly susceptible to brown rot as they ripen. Rotted fruits typically shrink into a wrinkled "mummy" as they dry on the tree. Both immature and mature fruit infected with brown rot tend to remain on the tree and form mummies.

Disease cycle

M. fructicola overwinters in dried infected fruit called mummies, or in cankers on twigs and branches. Mummies remain either hanging in the trees or scattered on the orchard floor during the winter. Both may produce spores that infect blossoms and young fruit in the spring, but the mummies that remain in the trees are more important than those on the ground.

Two types of spores are produced from mummified fruit. Ascospores are produced only on mummies that have fallen to the ground and have been partially covered with soil. Ascospores are less common in the Northeast than in semi-arid climates. In the northeast, most brown rot infections develop from conidia that are produced on mummies and infected twigs. Conidia are produced in late spring when temperatures range from 55–77°F and are spread by wind, rain, and insects.

Warm, wet weather favors brown rot infection. Although conidia can germinate and infect at temperatures between 32 and 90°F, optimum tempera-

continued...

ture for blossom infection of peach range from 70 to 77°F. Under these conditions, spores germinate and penetrate plant cells on wet blossom surfaces in as little as 5 hours. In tart cherries, significant blossom infection can occur following 12 hr of wetness at 60°F or 24 hr of wetness at 50°F. Blossom blight may also develop at lower temperatures with prolonged wetting periods.

Disease Management

Orchard sanitation is essential for reducing disease pressure. Prune out mummified fruit and cankers during the dormant season and either burn or bury them deep in the soil. Remove wild or neglected stone fruit trees in the area that may serve as reservoirs for disease. Fruits thinned after pit hardening are more likely to become infected on the orchard floor than those thinned prior to pit hardening because they decompose less rapidly, but the importance of thinned fruit on brown rot epidemics in the northeast has not been studied.

Any type of injury will provide a point of entry for the fungus: hail damage, insect feeding wounds, bird pecks, fruit cracking, limb rubs, twig punctures, picking/packing injuries. It is essential to control fruit feeding insects such as plum curculio, oriental fruit moth, and tarnished plant bug. Take special care during harvest and packing not to puncture or bruise fruit. Cool fruit to as close to 32°F as possible after harvest.

Fungicide program

Some of the label information and restrictions for brown rot fungicides are summarized in Table 1. The protectant fungicides (Bravo, captan, sulfur) must be applied prior to a wetting period to be effective. If disease pressure is not very high, captan may be a good choice for blossom bight sprays because it is economical. Be aware, however, that captan can be phytotoxic to some sweet cherry and plum varieties. Bravo is a better choice for brown rot control on sour cherries and plums because it also controls black knot. Bravo is also the better choice when disease pressure is high, but it cannot be applied beyond shuck split.

The sterol-inhibiting (SI) fungicides include Elite, Indar, and Orbit. All of them are labeled for controlling blossom blight and can be applied again 2 to 3 weeks prior to harvest to control fruit rots. None of them are labeled for brown rot control at shuck split or first cover, but if applied at these times to control other diseases on the label (mildew, peach scab, cherry leaf spot, etc.) they will also suppress brown rot infections on green fruit. Labels for these products contain varying limitations concerning which stone fruit can be sprayed, spray timing, numbers of applications per season, etc., so read labels carefully. SI fungicides should not be used exclusively for both blossom blight and fruit rot; these fungicides must be rotated with non-SI fungicides for effective resistance management. The SI fungicides can provide 24–48 hrs of kickback activity if conditions prevented a timely application of a protectant fungicide prior to an infection period.

The benzimidazoles were once very effective brown rot fungicides. Widespread resistance to this class of fungicides has left them ineffective for most areas in New York State. The benzimidazoles may provide effective brown rot control in young orchards in isolated locations where resistant strains from older orchards are unlikely to be present. The benzimidazoles used in combinations with other brown rot fungicides can suppress black knot if applied at 7-day intervals between white bud and shuck split. Rovral is a dicarboximide fungicide labeled for use against blossom blight. It should be used as a protective spray, although it does have limited post-infection activity (~48 hrs at 68°F). Vangard is in a different class of fungicides and, like Rovral, is labeled for only blossom blight control. It is labeled for use on all stone fruits EXCEPT sweet cherry. Vangard has yet to be extensively tested for blossom blight in New York.

Final Considerations

For many stone fruits, only one blossom blight spray may be needed unless disease pressure is high. Where large numbers of fruit were left unharvested

continued...

the year before, or when conditions are warm (above 60°F) and wet, more than one blossom blight application will be required. Petal fall applications are essential if bloom sprays were omitted and conditions turn warm and wet at petal fall. Fruit can be very susceptible to infection 1–3 weeks after shuck split, so shuck split and first cover sprays are important, especially in wet weather. Spray intervals should be tightened 3 weeks prior to harvest when fruit are most susceptible to brown rot. In order to manage disease resistance, SI fungicides such as Indar, Elite or Orbit should not be used continuously throughout the season for BOTH blossom blight AND fruit rot control. Use captan or other fungicides intermittently with preharvest SI fungicides. Lastly, ALWAYS remember to check product labels for timing and rates of application.❖❖

Table 1. Use patterns of various fungicides for control of brown rot on stone fruit.

Chemical Category	Fungicide	PB[1]	Bloom	PF	SS	Covers	PHI
Protectants[3]	Bravo	ACNP[2]	ACNP	ACNP	ACNP	****	0
	Captan	ACNP	ACNP	ACNP	*CNP	ACNP	0
	Ferbam	****	****	*C**	*C**	*C**	7
	Sulfur	*CNP	*CNP	*CNP	*CNP	*CNP	0
Sterol Inhibitors[4]							
	Elite	*CN*	*CN*	*CN*	****	*CN*	0
	Indar	ACN*	ACN*	ACN*	****	ACN*	0
	Orbit	ACNP	ACNP	ACNP	****	ACN*	0
Benzimidazoles[5]							
	Topsin-M	ACNP	ACNP	ACNP	ACNP	ACNP	1
	Benlate	ACNP	ACNP	****	****	ACNP	3
Dicarboximide[6]							
	Rovral	ACNP	ACNP	ACNP	****	****	0
Analinopyrimidine[7]							
	Vangard	ACNP	ACNP	****	****	****	0

[1] PB=pre-bloom (red bud for apricot, popcorn for cherry, pink for peach and nectarine, and white bud for plum and prune; PF=petal fall; SS=shuck split; Covers=cover sprays; PHI= pre-harvest interval.

[2] A=Apricot; C=Cherry; N=Peach and Nectarine; P=Plum and Prune.

[3] Do not apply Bravo after shuck split. On apricot, petal fall applications of captan should be made at 75% petal fall. Application of sulfur to mature nectarines may cause discoloration.

[4] Elite is also labeled on cherry for control of leaf spot and powdery mildew beginning at petal fall until terminal growth stops. On peaches, Indar can be applied for control of peach scab and on cherries for control of leaf spot beginning at shuck split at 10–14-day intervals up to harvest. Do not apply Orbit to 'Stanley type' prunes; do not apply to prunes after petal fall; do not apply more than 12 oz from early bloom through petal fall; no more than 2 applications are permitted for fruit rot control. Two additional applications can be applied to all stone fruits for control of powdery mildew or, on cherry, for leaf spot.

[5] If resistance is not an issue, these may be used in a fungicide resistance program. Fruit rot applications can begin 3 weeks prior to harvest. Topsin-M and Benlate should not be used alone.

[6] Do not make more than 2 applications per season.

[7] Do not apply to sweet cherries.

❖❖

FIELD NOTES

HUDSON VALLEY

HUDSON VALLEY APPLE SCAB

Apple Scab Ascospore Maturity Counts:

Date	% ascospores that were Imm.	Mature	Empty	No. spores in tower shoot
Saratoga Co.				
April 16	93	7	Trace	2
Orleans Co.				
April 16	59	40	1	21
Highland				
April 16	--------no data-------			172
Peru				
April 17	96	4	0	0
Sodus Center				
April 14	87	13	0	6
Williamson				
April 14	86	14	0	6

Bud stage:
McIntosh: Three quarter-inch green

INSETS

CROCUS FOCUS

SPRING PEEPERS

(Art Agnello & Harvey Reissig,Entomology, Geneva)

❖❖ Arthropod pests during the early season are not terribly numerous, but they do require some form of strategy—think of it as triage—to properly attend to the worst offenders and avoid wasting time on the lightweights. They include mites, rosy apple aphid, tarnished plant bug, and spotted tentiform leafminer. The key behind all of them depends, at least in part, on being familiar with your own orchards — does a given block have a history of, or susceptibility to, a specific pest? Start with your knowledge of the block, use a sampling procedure where appropriate, and make a management decision.

Mites

If you're not electing a delayed-dormant oil application as a part of your early season mite management program, you'll be needing to rely on either: one of the ovicidal acaricides (Apollo, Savey) available for use, whether before or after bloom; a rescue-type product (Pyramite, Kelthane, Carzol) that can reduce motile numbers if they should begin to lap at the threshold; or Agri-Mek, which falls somewhere between these two strategies. Please note that, while Apollo has a post-bloom label with a 45-day PHI, the comparable registration for Savey has yet to be approved in NY, so it's still showing a last use at pink bud stage, until we hear otherwise. Like the true ovicides, Agri-Mek should also be considered a preventive spray, since it needs to be applied early (before there are very many motiles) to be most effective, generally within the first 2 weeks after petal fall. Also, as a reminder, Carzol is now restricted to no later than petal fall, so it will probably be of limited use in most programs. For any of the rescue products, the operational threshold in June is an *average* of 2.5 motiles per leaf (see the chart on p. 60 of the Recommends).

Rosy Apple Aphid

Rosy apple aphid (RAA) will attack all apple varieties, but those such as Cortland, Monroe, R.I. Greening, Idared, and Golden Delicious are particularly susceptible, and those in the McIntosh family are relatively tolerant.

Our control recommendations for RAA cover the period from half-inch green to the pink bud stage, using any of a number of materials: Thiodan, Lorsban, Lannate, Vydate, Supracide, Danitol or Asana, listed roughly in order of increasing disruption of beneficial mites. Pink applications of any of these products do a better job than an earlier spray. This is an observation resulting from the fact that, in those cases where aphid populations have built up during early summer on vegetative growth inside the canopy, a pink spray will have done a more effective job of reducing populations than an earlier

continued...

treatment at half-inch green. From the standpoint of management practicality, it is therefore easier and more natural to consider the need for aphid control at the time of the pink spray. Provado is an excellent RAA material, but it can be applied no earlier than petal fall, by which time much of the fruit damage this insect causes already will have been initiated.

RAA nymphs are of course present at Pink, and large enough to see without difficulty, but they do occur on the same tree and in the midst of colonies of green apple aphids, which are not usually a problem until the summer. To distinguish among the species, you can use leaf damage as a cue, as well as the insects' color. RAA nymphs are usually pinkish, sometimes varying to a light brown, slate gray, or greenish black, and the body is covered with a whitish mealy coating. Most importantly, they have pronounced cornicles ("tailpipes"), and long antennae (more than half the body length). Green apple aphid nymphs are clearly green, and without the whitish cast. Their cornicles are little more than buttons, and the antennae are clearly less than half of the body length. Also, aphids found inside curled or distorted leaves at pink are almost always rosy apple aphids. If you find ONE infested cluster (1%, or stop as soon as you find one), we would advise including an RAA material in your pink spray; this threshold may be a little conservative for people who are skilled at finding the aphids.

Spotted Tentiform Leafminer

What else is happening at pink? STLM is laying eggs, but most orchards don't suffer too greatly from 1st brood leafminer, and even if so, a sequential sampling plan can be used to classify STLM egg density at pink or of sap-feeding mines immediately after petal fall (see p. 57 in the Recommends). Treatment is recommended if eggs average 2 or more per leaf on the young fruit cluster leaves at pink, or if sap-feeding mines average 1 or more per leaf on these leaves at petal fall. Sampling can be completed in approximately 10 minutes. In recent years, only 1 out of 6 sampled orchards have required insecticide treatments to control first-generation STLM populations. Vydate at pink or Provado or Lannate at petal fall are our standard recommendations for this pest; Provado will also add to the leafhopper control if you don't use enough Sevin at thinning to do an adequate job.

Miscellaneous

Leafrollers are also out there, but only part of the population is active at this time, so it's better to wait for bloom or petal fall to address this one. Tarnished plant bug is the only real player left, and you're going to have to decide for yourself whether this bug is a major concern to you. We have seen few orchards in western N.Y. where TPB control is warranted (slightly more so in the Hudson Valley), simply because the most effective treatment to use is still a pyrethroid, which a) wipes out predator mites, and b) still rarely lowers TPB damage enough to be economically justified. If you elect a spray of Ambush, Asana, Danitol or Pounce at pink for plant bug, you'll take care of rosy apple aphid (and STLM) at the same time; if rosies are your primary concern, scout for them first, and use Lorsban or Thiodan if you find any.❖❖

PHENOLOGIES

Geneva:
Apple (McIntosh): half-inch green
Apple (Red Delicious): half-inch green
Peach: quarter-inch green
Pear: bud burst
Sweet cherry: bud burst
Tart cherry: bud burst
Plum: early green cluster

Highland:
Apple (McIntosh): three quarter-inch green – early tight cluster
Apricot: full bloom
Pear: bud burst
Peach: half-inch green
Plum (Stanley): bud burst – early green cluster

scaffolds
Dept. of Entomology
NYS Agricultural Exp. Sta.
Barton Laboratory
Geneva, NY 14456-0462

PEST FOCUS

Geneva:
1st **spotted tentiform leafminer** and **redbanded leafroller** in traps today.

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–4/23):	137	63
(Geneva 1/1-4/23/2000):	228	89
(Geneva 1/1–4/23 "Normal"):	183	77
Coming Events:	**Ranges:**	
Green fruitworm flight peak	64–255	19–108
Spotted tentiform leafminer 1st oviposition	141–319	48–154
Redbanded leafroller 1st flight peak	180–455	65–221
European red mite overwintered eggs hatch	157–358	74–208
Obliquebanded leafroller larvae active	149–388	54–201
Oriental fruit moth 1st catch	129–587	44–338
Pear thrips in pear buds	137–221	54–101
Pear psylla 1st egg hatch	111–402	55–208
McIntosh at tight cluster	188–279	68–138

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	4/16	4/19	4/23
Green fruitworm	0.1	0.2	0.4
Redbanded leafroller	0	0	0.4*
Spotted tentiform leafminer	0	0	0.9*

* first catch

Highland, NY

	4/16	4/23
Green fruitworm	1.1	0.8
Redbanded leafroller	0.2*	7.1
Spotted tentiform leafminer	0.1*	2.2
Pear psylla eggs (per 100 buds)	100	350

This material is based upon work supported by Smith Lever funds from the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.