scaffolds
Update on Pest Management and Crop Development

FRUIT JOURNAL

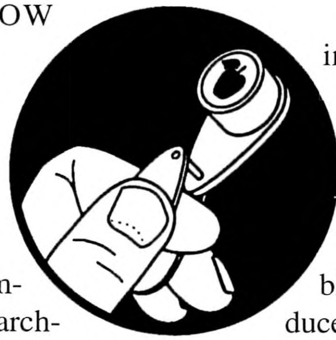
March 31, 1997 VOLUME 6, No. 2 Geneva, NY

DISEASES

SPRING FORTH

PREPARE NOW TO INITIATE SCAB SPRAYS!

(Dave Rosenberger, Plant Pathology, Highland)



❖❖ No matter what the circumstances, many of us (both field researchers and apple growers) have difficulty getting geared up for the first apple scab spray in spring. In recent years, we have de-emphasized green-tip fungicide sprays for apple scab. In clean orchards, green-tip sprays have proven unnecessary. But that may not be true in 1997.

For most of New York, 1997 could be a difficult year for apple scab! Many orchards had considerable levels of scab infections on leaves by the end of 1996. The cool, wet summer weather during 1996 allowed scab to remain active throughout summer. Although fruit scab was controlled reasonably well in most orchards, scab moved into leaves in late summer and fall. These infections will contribute to high inoculum levels for 1997. If we have another wet spring, then scab could become a major problem in 1997.

The lower Hudson Valley had less scab at the end of 1996 than most other regions of New York because the Hudson Valley escaped some of the 1996 infection periods to the north and west. Nevertheless, cool and wet conditions prevailed last summer in the Hudson Valley. Therefore, scab pressure for 1997 is still expected to be higher than normal in the Hudson Valley even though it may be less severe than in other parts of the state.

Green-tip sprays are extremely important where scab inoculum levels are high. Contact fungicides should be applied as soon as there is any evidence of green tissue, and they should be re-applied at approximately 7-day intervals either through bloom or until SI fungicides are introduced into the program. SI fungicides (Rubigan, Nova, Procure) generally are not cost-effective when applied prior to tight cluster. Thus, where SI fungicides will be used, they should be preceded by one or two sprays of contact fungicide unless the orchard was virtually free of apple scab on leaves at the end of 1996. After SI sprays are initiated, the spray interval can usually be extended to 10-days.

Copper applied at green tip as part of a fire blight management strategy will provide the same level of scab control as one would expect from a mancozeb spray. Oil applied with the copper spray will improve spray coverage, but it does not significantly affect the fungicidal properties of the copper spray. (We also demonstrated several years ago that applying mancozeb with 2% oil for mite control does not limit the redistribution of the mancozeb fungicide.)

In the lower Hudson Valley, spring has come relatively late during each of the last five seasons. During the winter, we used the apple scab ascospore maturation model that was developed by Dr. Dave Gadoury and applied the model to our weather records for the past 10 years. The model predicts ascospore maturation based on degree days accumulated from the green-tip bud stage on apples. Thus, on the graphs shown on the next page, the beginning of each graphed line

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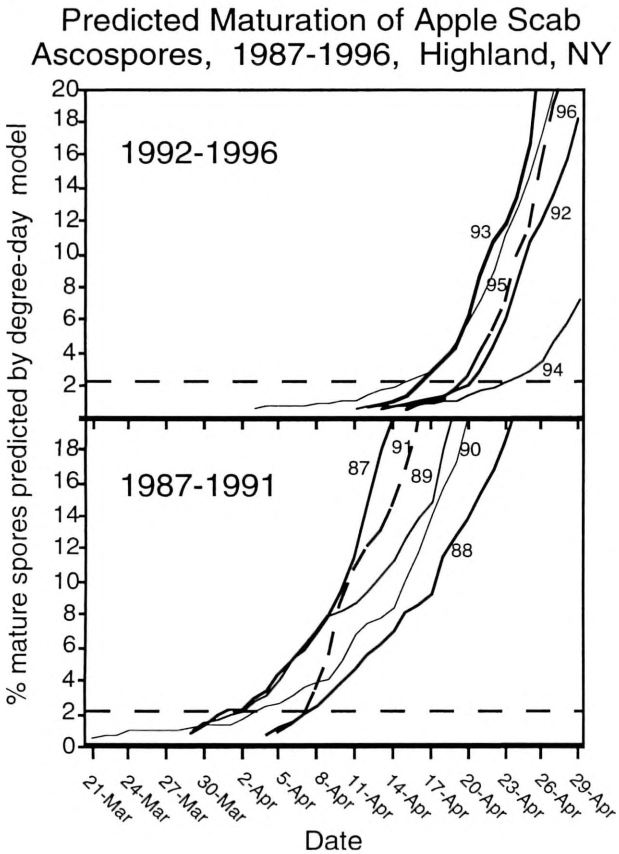
toward the lower left corner indicates the dates for green-*tip* on McIntosh for the respective years.



The most striking observation from the graph above is that apple scab ascospore development occurred roughly two weeks later during every year from 1992 to 1996, compared with the years from 1987 to 1991. To verify this observation, look at the dates when predicted ascospore maturity reached 2% (the dotted line on each graph). In the Hudson Valley, we have benefited from late springs during each of the past five years. Late springs allow more time to get sprayers up and running and clear brush from the orchards. Often, a late spring also means that fewer fungicide sprays will be needed prior to bloom because tree development may be more rapid when spring finally arrives.

THE WARNING: Be ready for an early spring! This could be the year that we revert to the spring weather patterns we had from 1987–1991. With high inoculum levels, it will be essential to get into the orchards and get a scab fungicide applied at green-tip.❖❖

BREAK DOWN

DEGRADING RELATIONSHIP

(Art Agnello, Entomology, Geneva)

GENERAL

❖❖ Much of the fruit region is receiving a few inches of snow this morning, so it's as good a time as any to make a run to your distributor's for any supplies you may need to deal with the effects of spray water pH on pesticide activity. As we've said in the past, there may be times when you don't get the expected results from a pesticide application, even though you used the correct concentration of the recommended material and applied it in the same way that has given acceptable control at other times. Although you may suspect a bad batch of chemical or a buildup of pesticide resistance, the poor results may in fact be due to alkalinity — that is, a solution with a pH higher than 7.0. A close inspection of the pesticide label will often reveal a caution against mixing the chemical with alkaline materials such as lime or lime sulfur. Or, even if not, it's wise to keep in mind that above pH 7.0 there is a possibility of the material's degradation. The reason for this is that many pesticides, particularly insecticides,

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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
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This newsletter available on CENET, on the Tree Fruit News bulletin board under FRUIT and on the World Wide Web at:
http://www.nysaes.cornell.edu/ent/scafolds/

undergo a chemical reaction under alkaline conditions that destroys their effectiveness. This reaction is called alkaline hydrolysis, and it can occur when the pesticide is mixed with alkaline water or other materials that cause a rise in the pH.

Hydrolysis is the splitting of a compound by water in the presence of ions. Water that is alkaline has a larger concentration of hydroxide (OH-) ions than water that is neutral; therefore, alkaline hydrolysis increases as the pH increases. Insecticides are generally more susceptible to alkaline hydrolysis than are fungicides and herbicides, and of these, organophosphates and carbamates are more susceptible than other materials such as pyrethroids. A survey of fruit-growing areas in N.Y. showed that water from as many as half of the sites in western N.Y. had pH values above 8.0.

Water at this pH could cause problems for compounds that will break down in only slightly alkaline water, such as ethephon (Ethrel). Compounds that break down at a moderate rate at this pH, such as Carzol and Imidan, should be applied soon after mixing to minimize this process in the spray tank. A smaller number of sites (less than a quarter of them) had pH levels greater than 8.5. Above this level, the rate of hydrolysis is rapid enough to cause breakdown of compounds such as Carzol and Imidan if there is any delay in spraying the tank once it is mixed. In a few sites having a pH above 9.0, compounds such as Guthion and malathion, which would not break down in most situations, may have problems. It is also important to note that in any one site, ground water pH can vary substantially (by nearly 2 pH units) during the season.

To prevent alkaline hydrolysis, you should:

1 - Determine the pH of your spray solution; because of seasonal variability, this should be done more than once during the growing season. Measuring your spray water pH before mixing is a good start, but it can be misleading, because the chemicals you use can raise or lower the pH of the overall spray solution. It makes more sense to take the time to run some bottle tests of your most-used spray materials after they have been mixed with your spray water. The most accurate method is by using an electronic pH meter; these are not too expensive anymore ($50-60), and have gotten fairly simple to use. Another, less accurate method uses dyes that change color in response to pH. These are available in the form of paper strips, or in solution for use in soil pH test kits. In general, the indicator is mixed with or dipped into the water, and the resulting color is compared against a standard color chart.

2 - To minimize loss of chemical effectiveness from hydrolytic breakdown in the tank, it is a good practice to apply right after it is mixed (as much as is allowed by the weather and other factors). If a delay occurs, a buffering agent may be added to the tank if the pH is high and the chemical you are using is susceptible to alkaline hydrolysis; these agents work by lowering the pH and resisting pH change outside of a certain range. A pH in the range of 4-6 is recommended for most pesticide sprays. Buffering agents are available from many distributors; some examples are: Buffer-X (Kalo, Inc.), Buffer P.S. (Helena), Spray-Aide (Miller), Sorba-Sprays (Uniroyal/Leffingwell), and LI 700, Choice (Loveland/AgChem Service). Some sources for pH testing materials are (pH Indicator Paper): Ward's Natural Science Est., PO Box 1712, Rochester, NY 14603; VWR, PO Box 1050 Rochester, NY 14603; Fisher Scientific, PO Box 8740, Rochester, NY 14642; (Soil pH Test Kits): Agronomy Soil Test Lab, 804 Bradfield Hall, Cornell Univ., Ithaca, NY 14853.

Growers may add technical flake calcium chloride to the tank when spraying cultivars such as McIntosh, which is susceptible to storage disorders related to inadequate levels of fruit calcium. However, research done in Massachusetts indicates that, although calcium chloride does not itself affect pH, a contaminant present as a result of the manufacturing process does increase the pH of the solution; this could in turn encourage alkaline hydrolysis. There are a few pesticide materials that should not be

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acidified under any circumstances, owing to their phytotoxic nature at low pH. Sprays containing fixed copper fungicides (including Bordeaux mixture, copper oxide, basic copper sulfate, copper hydroxide, etc.) and lime or lime sulfur should not be acidified. But if the product label tells you to avoid alkaline materials, chances are that the spray mixture will benefit by adjusting the pH to 6.0 or lower.

For further information on water pH and pesticide effectiveness, refer to N.Y. Food & Life Sci. Bull. No. 118, "Preventing decomposition of agricultural chemicals by alkaline hydrolysis in the spray tank", by A. J. Seaman and H. Riedl, from which much of this information was adapted (available from Communications Services Bulletins, Jordan Hall, N.Y.S. Agric. Expt. Sta., Geneva, NY 14456; 315-787-2249, FAX: 315-787-2276. Cost is $0.50 per copy; make checks payable to "Communications, NYS Agricultural Experiment Station"; postage stamps acceptable for payment of sums less than $1.00).❖❖

THE PAPER IT'S WRITTEN ON

SHELF-BUILDING (Art Agnello, Entomology, Geneva, and Warren Stiles, Fruit & Vegetable Science, Ithaca)

❖❖ To help supply you with the tools necessary to be well-informed as you begin the season, here is a current listing of all the tree-fruit publications that we can determine are available from the various Cornell sources, indicated by the following code letters:

(C) Resource Center-GP, Cornell Univ., 7 Business & Technology Park, Ithaca, NY 14850 Tel: 607/255-2080 FAX: 607-255-9946

(G) Communications Services Bulletins, Jordan Hall, N.Y.S. Agric. Expt. Sta., Geneva, NY 14456 Tel: 315/787-2249 FAX: 315-787-2276

(N) Northeast Regional Agric. Engineering Serv., Coop. Ext., 152 Riley-Robb Hall, Ithaca, NY 14853 Tel: 607/255-7654 FAX: 607-254-8770

(P) Photo Lab, Barton Laboratory, N.Y.S. Agric. Expt. Sta., Geneva, NY 14456

Tree Fruit Disease and Insect Fact Sheets

(Cost for individual Fact Sheets is $1)

102FSTF	Tree Fruit Fact Sheet Set $22. (C) Corresponding Slide Sets $25, Individual Slides $5. (P)
102GFSTF-D3	Fire Blight. 1994.
102GFSTF-D4	Powdery Mildew of Apple. 1980.
102GFSTF-D5	Cedar Apple Rust. 1981.
102GFSTF-D6	Black Knot of Plum. 1992.
102GFSTF-D7	Phytophthora Root and Crown Rots. 1992.
102GFSTF-D8	Cherry Leaf Spot. 1993.
102GFSTF-D9	Apple Scab. 1993.
102GFSTF-D10	Brown Rot of Stone Fruits. 1993.
102GFSTF-D11	Sooty Blotch and Flyspeck. 1994.
102GFSTF-D12	Perennial Canker. 1995.
102GFSTF-I1	Pear Psylla. 1978.
102GFSTF-I2	Codling Moth. 1996.
102GFSTF-I3	Plum Curculio. 1980.
102GFSTF-I4	Green Fruitworm. 1980.
102GFSTF-I5	Obliquebanded Leafroller. 1980.
102GFSTF-I6	Peachtree Borer. 1980.
102GFSTF-I8	Apple Maggot. 1991.
102GFSTF-I9	Spotted Tentiform Leafminer. 1980.
102GFSTF-I10	European Red Mite. 1980.
102GFSTF-I11	Rosy Apple Aphid. 1980.
102GFSTF-I12	San Jose Scale. 1980.
102GFSTF-I13	White Apple Leafhopper. 1980.
102GFSTF-I14	Dogwood Borer. 1985.
102GFSTF-I15	Cherry Fruit Fly and Black Cherry Fruit Fly. 1988.
102GFSTF-I16	Woolly Apple Aphid. 1988.
102GFSTF-I17	Oriental Fruit Moth. 1988.
102GFSTF-I18	Beneficial Insects. 1989.
102GFSTF-I19	Redbanded Leafroller. 1989.
102GFSTF-I20	European Apple Sawfly. 1991.
102GFSTF-I21	Tarnished Plant Bug. 1991.
102GFSTF-I22	Comstock Mealybug. 1991.
102GFSTF-I23	Predatory Mites. 1995.
102GFSTF-I24	American Plum Borer. 1997.
102GFSTF-M1	Meadow Vole and Pine Vole. 1980.

IB 112 - Training and Pruning Apple Trees. 1986. Reprinted 1992. $3.50. (C)
IB 219 - Orchard Nutrition Management. 1991. $4. (C)
IB 221 - Predicting Harvest Date Windows for Apples. 1992. $4.75. (C)
IB 227 - Economics of Apple Orchard Planting Systems. 1992. $3 (C)
IB 231 - Biology and Management of Apple Arthropods. 1993. $5.50 (C)
IB 236 - Wildlife Damage Management in Fruit Orchards. 1994. $4.75 (C)
IB 237 - Pollination and Fruit Set of Fruit Crops. 1995. $3. (C)
IPM 207 - Apple IPM: A Guide for Sampling and Managing Major Apple Pests in New York State. 1993. (IPM Manual) $10. (C)
Video. - Simplified Insect Management Program: A Guide for Apple Sampling Procedures in New York. 1989. Rental $20, Purchase $29.95. (C)
AF - Braeburn. 1993. $0.50 (G)
AF - Gala. 1993. $0.50 (G)
AF - Fuji. 1993. $0.50 (G)
AF - Gingergold. 1993. $0.50 (G)
FLS 50 - Green Fruitworms. 1974. $1. (G)
FLS 53 - Empire, a High Quality Dessert Apple. Reprinted 1992. $1. (G)
FLS 58 - Growth Stages in Fruit Trees - From Dormant to Fruit Set. 1976. $2. (G)
FLS 92 - Biology and Control of Cytospora Fungi in Peach Plantings. 1982. $0.30 (G)
FLS 95 - Blister Spot of Apple. 1982. $0.30 (G)
FLS 108 - Diagnostic Keys for Diseases of Apple, Peach and Cherry. 1984. $0.50 (G)
FLS 116 - Chemical Thinning of Apples. 1986. $0.50 (G)
FLS 117 - Peach and Nectarine Varieties in New York State. 1986. $0.50 (G)
FLS 118 - Preventing Decomposition of Agricultural Chemicals by Alkaline Hydrolysis in the Spray Tank. 1986. $0.50 (G)
FLS 119 - IPM in New York Apple Orchards - Development, Demonstration, and Adoption. 1987. $0.50 (G)
FLS 123 - Basing European Red Mite Control Decisions on a Census of Mites Can Save Control Costs. 1988. $0.50 (G)
FLS 124 - Insects Associated with Apple in the Mid-Atlantic States. 1988. $1. (G)
FLS 127 - Sweet and Tart Cherry Varieties: Descriptions and Cultural Recommendations. 1989. $0.75. (G)
FLS 128 - The Effects of Ground Cover Manipulations on Pest and Predator Mite Populations on Apple in Eastern New York. 1989. $0.50 (G)
FLS 133 - Northern Lights Apple. 1990. $0.50 (G)
FLS 134 - Royal Empire Apple, a Sport of Empire. 1990. $1. (G)
FLS 139 - A Method to Measure the Environmental Impact of Pesticides. 1992. $1. (G)
FLS 140 - Royalton Black Sweet Cherry. 1993. $1. (G)
FLS 141 - Hartland Black Sweet Cherry. 1993. $1. (G)
FLS 142 - Fruit Pest Events and Phenological Development According to Accumulated Heat Units. 1993. $1. (G)
FLS 143 - Sampling Second Generation Spotted Tentiform Leafminer. 1993. $0.50 (G)
FLS 145 - Minimal Processing of New York Apples. 1995. $2. (G)
FLS 146 - Small Scale, Sustainable, IPM and Production Systems for Apples in Romania. 1996. $2. (G)
FLS 147 - Fortune Apple. 1995. $1. (G)
Sch 6 - Phytophagous and Predaceous Mites on Apple in NY. 1980. $0.50 (G)
Sch 36 - Biology of the Codling Moth in Hudson Valley Orchards. 1989. $0.50 (G)
SpR 55 - Proceedings, Brown Rot of Stone Fruit Workshop. 1985. $0.50 (G)
SpR 57 - 1985 Processed Apple Products Workshop. 1985. $0.50 (G)
SpR 65 - Processed Apple Products Workshop. 1992. $1. (G)
SpR 67 - Juice Technology Workshop, Oct. 1993. $10 (G)

FIELD NOTES

APPLE SCAB UPDATE
(Dave Rosenberger, Highland)

❖❖ Apple scab ascospore maturity, Highland, NY, for leaves collected March 27 with buds at silver tip showed 96% immature spores, 4% mature spores, and a mean tower spore discharge of less than one spore per slide. It appears that scab spores are still "smart" enough to await green tissue on trees before they begin their spring flight. With the counting methods we use, we generally do not reach a commercially significant level of spore discharge until there are 15–17% mature spores. Warm weather last Friday, Saturday, and Sunday may speed both spore development and the arrival of green-tip on apple trees.❖❖

PHENOLOGIES

Geneva and Highland:
Apple - **Dormant**
Pear, cherry - **Dormant**
Peach, plum: **Dormant**

PEST FOCUS

Highland: 1st **pear psylla adults** observed 3/26.

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1 - 3/31):	79	28
(Highland 1/1 - 3/26):	64	19

Coming Events:	Ranges:	
Green fruitworm 1st catch	41–143	9–69
Pear psylla adults active	2–121	0–49
Pear psylla 1st oviposition	25–147	1–72
McIntosh at silver tip	56–137	17–58

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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