scaffolds Update on Pest Management and Crop Development

FRUIT JOURNAL

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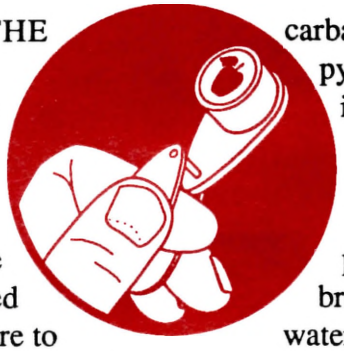
GENERAL INFO

pHILLING THE TANK

IONS IN THE STREAM
(Art Agnello)



❖❖ There's still probably more call for a snowplow than a speed sprayer so far, but the weather is sure to moderate one of these days, so the following is a rerun of our annual message about the effect of spray water pH on pesticide activity. 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. The reason is that many pesticides, particularly insecticides, undergo a chemical reaction under alkaline conditions that destroys their effectiveness. This reaction is called alkaline hydrolysis, and 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 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.

In order 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 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; however, these are expensive and not very practical. Another, less

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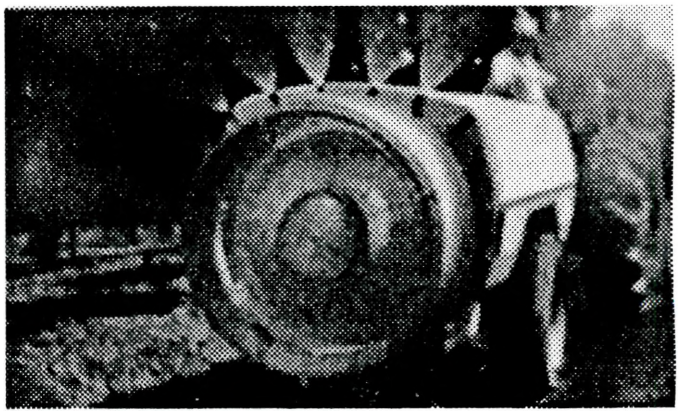
accurate method uses dyes that change color in response to pH. These are available in the form of paper strips, or in solution for use in soil pH test kits. In general, the indicator is mixed with or dipped into the water, and the resulting color is compared against a standard color chart.

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 Lab), Nutrient Buffer Sprays (Plant Health Technologies/ Monterey), Spray-Aide (Miller), Sorba-Sprays (Uniroyal/Leffingwell), and LI 700 (Loveland/ AgChem Service, Agway). 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 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.❖❖



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Dept. of Entomology
NYSAES, Barton Laboratory
Geneva, NY 14456-0462
Phone: 315-787-2341 FAX: 315-787-2326
E-mail: art_agnello@cornell.edu

Editors: A. Agnello, D. Kain

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FIELD NOTES

IF THE PHONE RINGS

❖❖ Telephone number changes at the Hudson Valley Lab: During the past winter, we added a telephone line and rearranged assigned telephone numbers at the Hudson Valley Lab. Assigned phone numbers are now as follows:

Dave Rosenberger	914-691-7231
Dick Straub	914-691-6516
Ed Stover	914-691-6787
Warren Smith	914-691-7117

Rosenberger, Straub, Stover, and Smith respond to calls on their lines whenever they are in the building. If no one answers after 6 or 7 rings, it indicates that neither the person being called nor our receptionist, Donna Clark, are available. The caller can either call back at another time, or they can call back on our general use line, 914-691-7151, and leave a message on the answering machine.

Rosenberger, Stover, and Straub can also be reached at 914-691-7151 during hours when our secretary/receptionist, Donna Clark, is on duty. Donna works from 8:00 AM to noon and from 1-3:30 PM Monday through Friday. However, she is sometimes away from her desk and unavailable to answer the telephone for short periods during these working hours. When Donna is not available, including sick days and vacation days, the 7151 number will be answered by a research technician if one of them is working at his or her desk. Otherwise, callers will get the answering machine.

We are sorry that we are unable to provide more complete and effective phone answering services, but we believe the current arrangement is the best we can do within current budget limitations.❖❖

SCAB

APPLE SCAB ASCOSPORE MATURITY
(D. Rosenberger)

Highland, NY:

	Immature	Mature	Discharged	Tower shoot
4/7	92%	8%	0%	0 spores

APPLE SCAB UPDATE

❖❖ There was no change in maturity over the past week because of cold weather. The lower Hudson Valley had five inches of snow on Saturday with snow cover persisting through mid-day on Sunday. Additional rain showers occurred on Sunday evening. These wetting events posed no threat for scab infections because of the cold temperatures and the lack of mature spores.❖❖

ERRATUM

WHOOPS
(Jan Nyrop)

❖❖ If you read last week's Scaffolds article on transferring predatory mites, there probably appeared to be extraneous text and figures that were unrelated to the topic being discussed. This is because there actually were extraneous figures and text. After editing an earlier and more extensive article to produce the write-up for Scaffolds, I neglected to remove some figures and text from the original file. These were formatted with the article as though they belonged. Figs. 2 and 3 were extraneous, as was the last paragraph. However, for all you information mavens, Fig. 2 depicted proportions of identified phytoseiids that were either *A.fallacis* or *T. pyri*. *Typhlodromus pyri* were most common in trees into which *T. pyri* were transferred at bloom, but least common in trees into which no predators had been transferred. There were

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no apparent differences in predator species composition in trees into which predators were transferred at half-inch green vs. tight cluster. Fig. 3 depicted the effect of summer oil applications on *T. pyri*. At both the Minns and Trickler sites, the two 1% oil applications resulted in fewer *T. pyri* (Minns $p < 0.01$; Tricker $p < 0.01$). However, the effect of the oil treatments was more pronounced at the Trickler location, where the volume of oil applied was much higher.❖❖

Geneva: McIntosh @ **silver tip**
Highland: McIntosh @ **quarter-inch green**

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva NY

	4/3	4/6	4/10
Green fruitworm	0	0	0.1
Redbanded leafroller	0	0	0

HVL, Highland NY

	4/3
Green fruitworm	0.1
Pear psylla eggs/bud	-
Redbanded Leafroller	0

* = 1st catch

(Dick Straub, Peter Jentsch)

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1 – 4/10):	125	53
Coming Events:	**Ranges:**	
Green fruitworm peak	64–221	19–108
Redbanded leafroller 1st catch	32–480	5–251
Spotted tentiform leafminer 1st catch	73–433	17–251
Rosy apple aphid nymphs present	91–291	45–148
McIntosh at green tip	24–161	4–74

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.

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

ARTHUR AGNELLO
ENTOMOLOGY
BARTON LAB
NYSAES