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Update on Pest Management and Crop Development

R U I T J O U R N A L

ıst 19, 2002 VOLUME 11, No. 23 Geneva, NY

INSECTS

ORCHARD RADAR DIGEST

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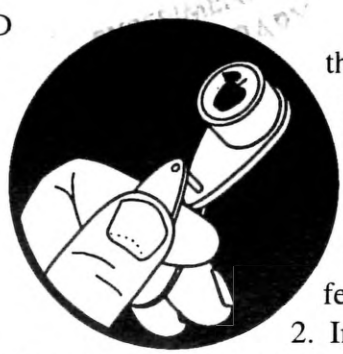

Geneva Predictions:
Codling Moth
CM development as of August 19: 2nd generation adult emergence at 96% and 2nd generation egg hatch at 79%.

Highland Predictions:
Codling Moth
CM development as of August 19: 2nd generation adult emergence at 100% and 2nd generation egg hatch at 93%.

DISEASES

SKIN CARE

CLEAN UP BEFORE APPLE HARVEST TO MINIMIZE POSTHARVEST DECAY PROBLEMS

(Dave Rosenberger, Plant Pathology, Highland)

❖❖ *Penicillium expansum*, the fungus that causes blue mold decay in stored apples, is generating significant losses both during controlled atmosphere (CA) storage and during shipment of packed apple fruit. Thiabendazole (Mertect 340F) and other benzimidazole fungicides provided excellent control of *P. expansum* for nearly 25 years. However, thiabendazole is no longer effective because the populations of *P. expansum* in most packinghouses have developed resistance to the benzimidazole fungicides. Captan, the only other alternative for postharvest application on apples, has never been very effective for controlling *P. expansum.*

Research that we conducted over the past six years has led to the following conclusions:

1. Inoculum levels for *P. expansum* gradually increased from year to year after postharvest fungicide treatments were no longer effective.

2. Inoculum of *P. expansum* survives from one year to the next on field bins and on storage floors and walls. A single badly contaminated wooden bin can carry more than 2 billion spores. Plastic bins may carry fewer spores, but even plastic bins have been shown to carry 480 million spores. These spores are released into postharvest treatment solutions where they can contaminate the new crop each year. Spores can also be spread from bins to fruit by air movement in CA rooms.

3. When inoculum levels are high, *P. expansum* can invade apples through their stems during long-term (>6 months) CA storage.

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4. Fruits with the early stages of stem-end decay are difficult to detect on packing lines, so some of them end up in retail packages. Airborne spores released during packing contaminate other fruit on the packing lines and cause additional decays in packed fruit.

5. As a result, decayed fruits are appearing with unacceptable frequency in retail store displays. We found blue mold decay in 37% of 131 Empire displays and in 21% of 141 McIntosh displays during systematic grocery store surveys of bagged apple displays that were conducted during February, March, and April of 2000 and 2001. The presence of decayed apples in bagged fruit almost certainly contributes to lost sales.

6. Improved sanitation measures provide the only option for reducing losses to *P. expansum.*

Following are sanitation measures that should be implemented by apple growers, storage operators, and packinghouses prior to harvest:

1. At a minimum, all decayed fruit mummies should be removed from field bins before bins are refilled. Decayed apples do not float, so they remain in bins as bins come out of the water flotation tanks on packing lines. Conscientious packinghouse operators will ensure that workers remove all of the decayed fruit before the empty bins are bundled. These decayed fruits carry vast amounts of inoculum that will contaminate next year's crop if they are left in the bottoms of bins. Apple growers should inspect bins as the bins are unbundled in the field prior to harvest, and any of these unwanted "gifts" that remain in the bins should be removed.

2. Sanitize packinghouse and storage walls and floors during summer by treating them with a quaternary ammonium sanitizer. Quaternary ammonium compounds are registered for disinfecting storage rooms and can be purchased from your chemical supply dealer. Follow directions on the product labels. In addition to eliminating inoculum, quaternary ammonium sanitizers will also eliminate foul odors caused by non-pathogenic bacteria and fungi (molds) that sometimes persist on storage walls and floors. Storage odors can be transferred to and persist in fruit, so cleaning storage walls and floors may improve fruit quality at the same time that it reduces the inoculum for post harvest decays.

3. If possible, sanitize badly contaminated bins (i.e., bins that came out of storage containing many decayed fruits) with a quaternary ammonium wash. Quaternary ammonium sanitizers can reduce inoculum loads on bins by more than 99% if all of the decayed fruit and fruit residues are removed before the sanitizer is applied. Steam cleaning bins is also effective, but it may be less practical than a drenching system for applying quaternary ammonium sanitizers.

4. Whenever possible, avoid wetting fruit after harvest. Postharvest drenching spreads spores of *P. expansum* from bins to wounds and to fruit stems where they can initiate decays. Fruits that are not drenched can still become contaminated by airborne spores in the CA rooms, but the proportion of fruit exposed to inoculum will be significantly reduced if fruits are not drenched.

5. When fruit must be drenched to prevent storage scald, drench solutions should be mixed in relatively small quantities and solutions should be changed regularly to avoid accumulating a

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large number of spores in the drench solutions. Even though most storages contain benzimidazole-resistant populations of *P. expansum*, the fungicide thiabendazole should still be included in drench solutions to control *Botrytis cinerea* and to suppress fungicide-sensitive strains of *P. expansum*.

Postharvest handling procedures for apples will probably become more tightly regulated in the future because of increasing concerns about food safety. The same pathogens that have caused sporadic problems with apple cider can also contaminate fresh apples. To date, I am not aware that anyone has gotten sick from eating fresh apples, but laboratory studies conducted elsewhere have shown that some human pathogens can survive on or in whole apple fruit. As a result, both chain store buyers and government regulators are likely to impose new food safety requirements that will affect apple handling and storage. How those regulations and requirements will evolve is still unclear, but it might be wise to avoid any new investment in postharvest drenching equipment for apples until the industry can determine how food safety issues will be addressed.❖❖

CHEM NEWS

FRESH WORD

Diazinon

❖❖ Scott Rawlins of Makhteshim Agan sent the following latest information regarding the regulatory status of Diazinon: The EPA has published the Interim Reregistration Eligibility Decision (IRED) for Diazinon on the internet. The entire IRED can be found on the EPA website at www.epa.gov/pesticides/op. A summary of the pertinent proposed changes for tree fruits follows:

Apples: All pests deleted except for Woolly Apple Aphid. Only one application allowed per growing season.

Apricots: May only be used for dormant season applications, only one application per dormant season. It is recommended that diazinon should be applied every other year unless pest infestations can be controlled only with consecutive, annual treatments.

Cherries: Dormant: Apply only once during the dormant season; apply only every other growing season, unless pest infestations can be controlled only with consecutive, annual treatments. In-season: Only one in-season application per growing season.

All tree fruit crops: 4-day REI.

SmartFresh

(Jim Wargo, Lake Ontario Fruit Program, Lockport; Fruit Notes, Aug. 9, 2002)

On July 17th, AgroFresh Inc. received US EPA registration for SmartFresh, whose active ingredient is 1-MCP. SmartFresh qualified for review in the EPA's Biopesticide division as a reduced risk product, due to its extremely low use rate and highly favorable safety profile. Residues, if any, are so low they are considered below detectable levels. As such, the EPA granted an exemption from tolerance for the product. SmartFresh was registered for apples only, but other produce is soon to follow. The label does not restrict which varieties can be treated, but suggests only certain varieties be used. Applications can be made in a commercial CA room only.

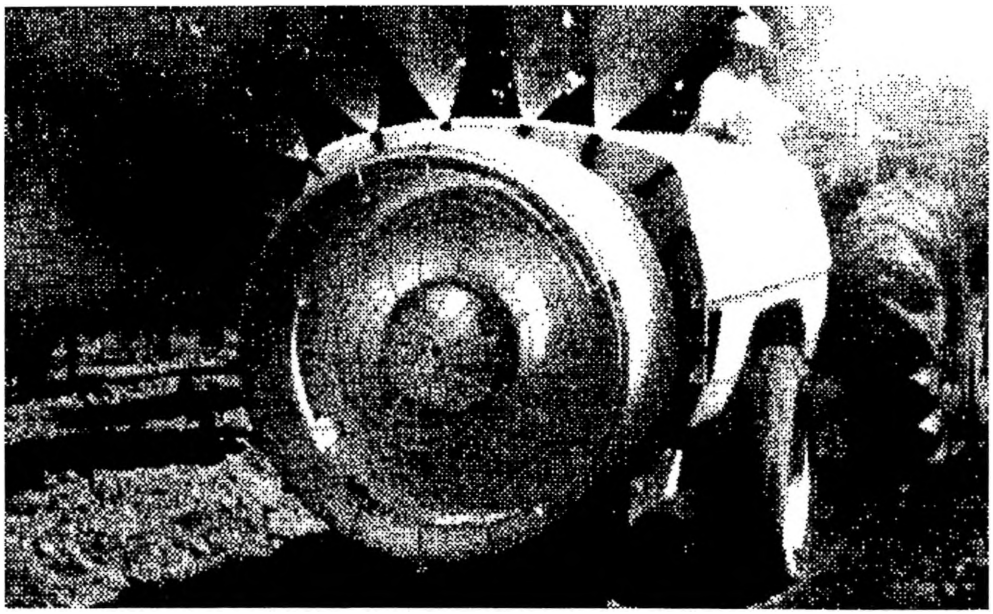
The complete data package has been submitted to the NY DEC for review and registration. SmartFresh cannot be used in NY until it is registered by the DEC. We are hopeful for registration to come through in time for mid- to late season apple varieties. There is still the chance that NY may not get SmartFresh this year. At this time, SmartFresh is registered in Washington state and Ohio. As has been the case, the waiting game continues for us in NY.❖❖

GENERAL INFO

DON'T FORGET!

N.Y. FRUIT PEST CONTROL FIELD DAY - 2nd NOTICE

❖❖ Don't forget this annual event, sponsored by the Departments of Plant Pathology and Entomology, which has been scheduled for September 4–5 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. First in Highland, the tour of research plots will take place on Wednesday, September 4. On Thursday, September 5, the activities shift to the Geneva Station, where there will be presentations on disease and arthropod control in tree fruits and grapes. Registration begins at the Hudson Valley Laboratory in Highland at 8:30 (Wednesday, September 4) and at Barton Laboratory, NYSAES, Geneva at 8:30 (Thursday, September 5). See you there.❖❖



UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–8/19):	2869	2012
(Geneva 1/1-8/19/2001):	2793	1945
(Geneva "Normal"):	2641	1853

Coming Events:	**Ranges:**	
Codling moth 2nd flight subsides	2518–3693	1705–2635
American plum borer 2nd flight subsides	2841–3698	1907–2640
Lesser appleworm 2nd flight subsides	2775–3466	2002–2460
Obliquebanded leafroller 2nd flight peak	2482–3267	1616–2231
Redbanded leafroller 3rd flight peak	2514–3285	1818–2625
Oriental fruit moth 3rd flight subsides	2987–3522	2018–2377
Lesser peachtree borer flight subsides	2782–3474	1796–2513
Peachtree borer flight subsides	2230–3255	1497–2309
San Jose scale 2nd flight subsides	2494–3582	1662–2477
Spotted tentiform leafminer 3rd flight peak	2383–3142	1626–2231
Spotted tentiform leafminer 3rd flight subsides	3235–3471	2228–2472

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	8/12	8/15	8/19
Redbanded leafroller	0.1	0.5	0.0
Spotted tentiform leafminer	171	608	202
Oriental fruit moth	4.5	3.7	5.8
Lesser appleworm	5.2	5.3	10.6
Codling moth	0.6	2.3	3.8
San Jose scale	3.7	7.2	3.3
American plum borer	0.9	1.5	0.3
Lesser peachtree borer	0.9	0.8	2.3
Peachtree borer	0.2	0.2	2.5
Obliquebanded leafroller	0.1	0.2	0.0
Apple maggot	0.05	0.0	0.04

Highland, NY

	8/5	8/12
Redbanded leafroller	0.9	1.4
Spotted tentiform leafminer	35.6	38.3
Oriental fruit moth	0.9	0.4
Codling moth	2.9	1.5
Lesser appleworm	0.6	0.7
Tufted apple budmoth	0.0	0.2
Variegated leafroller	0.6	0.9
Obliquebanded leafroller	0.6	0.3
Apple maggot	0.1	0.0
Sparganothis fruitworm	0.3	0.8
Fruittree leafroller	0.0	0.0
Dogwood borer	0.6	0.1

* first catch

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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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