RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

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Bird Repellent Methods, Part I

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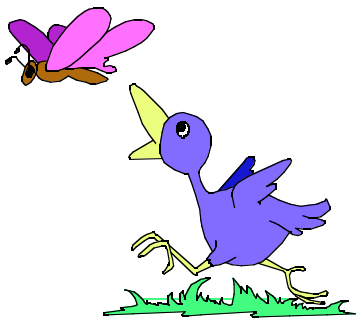

The following article was adapted from Ontario FactSheet No. 98-035, June 1998. This week acoustical repellents will be covered and will continue next week with visual repellents, physical exclusion and biochemical repellents.

There are four types of bird repellent methods currently available to growers:

- acoustical repellents
- visual repellents
- physical exclusion
- biochemical repellents

An integrated approach, using a variety of these repellent methods is needed.

Acoustical Repellents

Acoustical repellents rely on sound to scare birds away. Birds have a hearing range similar to human, so if people can hear it, birds can hear it. Unlike rodents, birds *cannot* hear ultrasonic sounds.

Propane-Fired Cannons (Bird-Bangers)

The most familiar acoustical bird repellent equipment is the *propane-fired cannon*. These units cause birds to flee by producing loud, unexpected blasts. Also known as *bird-bangers*, these are available in a wide range of configurations, from mechanical single-shot units, to fully electronic, randomized, rotating multi-shot units. These latter units are the most effective over the long term, since the timing and direction of the blast is truly random and the birds do not know when or where the next blast will occur. Although the loudness of the blast is important, it is the unexpected nature of the blast that keeps birds nervous. Units should *never* blast at intervals of less than 3 minutes. Birds quickly get accustomed to units that are stationary, shoot at regular intervals, or fire very rapidly. *More blasts are not better.*

Unfortunately, neighbors never get used to propane-fired cannons because of the loud sounds produced (measurements taken beside the units have shown up to 115 dBA), the frequency of the blasts (up to 20 times/hour), and the time of day they must operate (starting at dawn when people are still sleeping). Many people work shifts and must

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sleep during the day, so propane-fired cannons are not very popular with them.

The newer fully electronic propane-fired cannons are equipped with automatic electronic timers which allow growers to program the operating hours of the unit. These timers, unlike older light-activated photocell times, provide the flexibility of allowing the unit to be turned on and off during the day when birds may not be feeding as heavily.

Guidelines on the use of propane-fired cannons are:

- set at intervals greater than 3 minutes
- use between sunrise and sunset when birds feed
- operate no more than one unit per 2 ha (5 acres), unless it is absolutely necessary
- avoid operating near neighbors' houses
- ensure that propane tank valves do not leak, as this can cause units to blast unintentionally, even when they are shut off
- move the units around to keep the birds off-guard
- use electronic clock timers that automatically shut off the units

Electronic Sound Devices

Electronic sound devices are considered less irritating to neighbors than propane-fired cannons. There are two types currently used that broadcast electronic synthetic sounds to repel birds.

- random noises, irritating to birds (traditional)
- reproduced distress calls that mimic individual bird species

The traditional electronic sound device is often referred to as the *AV Alarm®,* a trade name that has been familiar in the industry for 30 years . Their electronic warbling sound interferes with the bird's sensory system, producing an environment that makes birds uncomfortable and insecure. In some cases, the birds are unable to communicate with each other freely and will leave the area. These units work well when used in a combination with propane-fired cannons. The electronic sound device keeps the birds irritated and edgy, while the cannon provides the stimulus to drive them away.

A new generation of electronic sound devices uses digital technology to produce distress calls of specific birds. They are only effective against the bird species whose distress calls are encoded on the microchip. However, some residual repellent effect may be noticed on species that normally travel together with the target birds. Some farmers report that digital units also attract birds of prey, such as hawks, who misinterpret the electronic distress calls for the real thing. Hawks circling the farm will also scare away birds. Even though these units produce electronic bird distress calls, they sound to us like real birds, and are usually not as objectionable to neighbors. These devices also produce a lower decibel sound level than the more traditional units.

Both types of electronic sound devices can be used to discourage birds from nesting in nearby trees in the spring.

Whistling and/or Pyrotechnic Pistol Cartridges

These are cartridges that are launched from a hand-held pistol and produce a loud, whistling sound throughout their flight. There is also a delayed reaction banger cartridge that travels through the air in silence, then explodes high in the air near flocks of birds as they are flying with the same sound level as a propane-fired cannon. Shooting these earpiercing sounds into a flock of birds works well as a repellent. These units can quickly clear a field, woodlot or hydro line before the flock lands on the crop. Airports often use this type of equipment, but they are especially popular with farmers, and may be the most effective manual scaring device available.

Other Sound Producing Devices

Many other sound producing devices or strategies have had only limited success. These can include air horns, clanging aluminum pie plates, shiny flashing metal objects, firecrackers and *Mylar* humming lines. These devices generally work only for a few days before the birds start to ignore them again. They might be most effectively used in the days just before harvest when bird pressure is the greatest.

Submitted by Jerome L. Frecon, Agricultural Agent ❑

Meeting Calendar

August 18, 1998, 6:30 p.m. - Direct Marketing Twilight Meeting, Monmouth County, Atlantic Farms, 1506 Atlantic Avenue, Wall Township (Rt. 524), NJ 08736. Contact Ramu Govindasamy at (732) 932-9171 ext. 25.

Worms, Part Two

Peter Shearer, Ph.D., Tree Fruit Entomology

Several New Jersey apple orchards are experiencing high levels of **Oriental Fruit Moth** (OFM). Orchards with this problem are generally composed of large, dense trees whose canopy structure makes it difficult to get good coverage during spray operations. I suspect that lack of pruning to open up the canopy so sprays can reach the trees' interior is a major reason why high levels of OFM are observed. But, as indicated in last week's newsletter article, "Where Did these Worms Come From?" (P&PA Newsletter, Aug. 4, 1998), other reasons, including insecticide resistance, could be involved.

Part of my research program is looking at the possibility that OFM are becoming resistant to organphosphorus (OP) insecticides. Work conducted in my laboratory for the past two years has resulted in an assay that can rapidly assess OFM susceptibility to OP (in this case, azinphosmethyl). For the assay, we capture male OFM moths over night in pheromone traps, then bring them back to the lab and topically treat the moths with a small drop of diluted azinphosmethyl. We use a range of concentrations so we can generate a dose-response graph. As we increase the dosage, mortality increases. With this information, we can determine how much insecticide is required to kill 50% or 90% of the population. We then compare those mortality values (and other parameters) with values obtained from other populations to see if there are differences in the amount of azinphosmethyl needed to kill the same proportion (50 and 90%) of moths.

For comparison, I have tested the responses of male OFM moths from three minimally-sprayed research orchards. Those orchards characteristically have lots of unsprayed fruit trees, so it stands to reason that moths from these orchards would be susceptible to azinphosmethyl. After collecting data in these orchards for two years, I feel comfortable with the assay because I get reproducible results within a year and between years.

The assay has recently been deployed in several "OFM-outbreak" orchards. Results indicate that there are differences in OFM susceptibility when we compare dose-mortality results from the minimally sprayed research orchards with the commercial orchards. In the worse case, it takes about 3 and 2.6 times more azinphosmethyl to kill 50% and 90% of the trapped moths from one orchard, as compared to the most susceptible moths.

So, does that mean OFM in some New Jersey orchards are resistant to azinphosmethyl? I don't know. I need more information before I can feel comfortable answering that question. First, does my assay method reflect reality? (I am testing the response of **male** moths while you, as a grower, target your sprays against newly hatched larvae.) So, I must determine if adult male mortality is related to 1st instar larvae mortality.

Second, is a threefold increase in susceptibility enough to say there is a resistance problem? Maybe, but generally entomologists use a tenfold factor. However, since my reference populations have received OP sprays in the past, they are not truly susceptible populations. Thus, if I had a truly susceptible reference population, the threefold difference in susceptibility might actually be greater. Also, studies of other tree fruit pests have shown that even when decreases in susceptibility can be detected indicating resistance development, field populations are still susceptible. That is because the range in labeled rates was high to start with and is still effective. So in our case, it may be possible for you to increase your rate of OP and still get control. Be warned, though that this could bring on resistance faster.

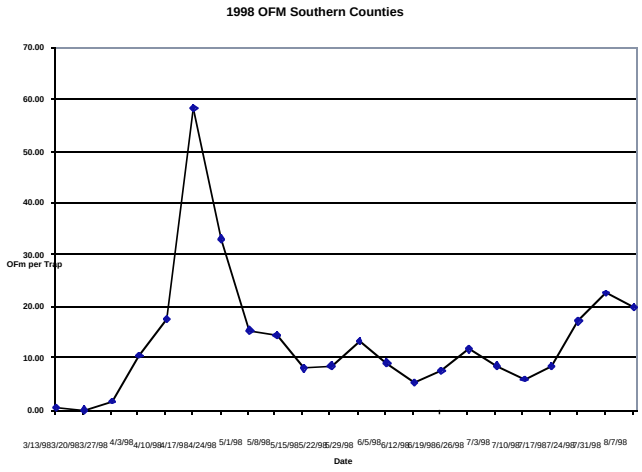
A third question that needs answering is, can we get control of OFM in these problem orchards under optimal conditions? I envision a research project in a couple of orchards where we prune to allow spray penetration, apply a couple rates of azinphosmethyl to different trees in sufficient water to get good coverage, choose another insecticide (possibly Asana) to use for comparison, then evaluate the results. If we can't achieve control under those conditions, then that's further indication that we have resistance problems. *Remember that good coverage is a must.* Right now, OFM are laying eggs on fruit. Unless the fruit have a covering of insecticide, the hatching larvae won't be killed as they crawl across the fruit before they chew into it. In some of the "OFM-outbreak" orchards, good coverage is lacking. That is one, big reason why I am hesitant to say that there is a resistance problem with OFM. Regardless, I need more data before I can be definitive with this resistance question. ❑

Fruit IPM

Dean Polk, Agricultural Agent

Peach

Oriental Fruit Moth: Trap catches of adults have decreased slightly. Eggs are being laid and larvae are emerging. Where trap counts are high, growers should maintain insecticide sprays to within 14 days of the first picking (Imidan). *Remember that Guthion has a 21 day PHI.* Under high pressure Lannate (4 day PHI) may be added, or may be used in place of the Imidan or Guthion for the last spray. It may be used anyway for control of tufted apple budmoth, but is best not used alone in repeated covers for OFM control, unless intervals are close together. Asana has a 14 day PHI, Ambush (5day PHI) and Pounce (7 day PHI).



San Jose Scale: Scouting reports and harvest samples are showing some peaches with red spots on them. Upon close examination you may see a small scale insect in the center of the mark. These are San Jose Scales which settled down in early June. If you see this on your fruit, be sure to make a note concerning which blocks are infested. These blocks are candidates for delayed dormant oil during the following spring.

Tufted Apple Budmoth (TABM): Egg masses were seen this past week, with some having recently hatched. First and second instar larvae are present in apples and peaches. In places these are present in the same leaf as mature larvae and pupae from the first generation. This is highly unusual, and means that the two generations are overlapping. New feeding has also been noted. Lannate (2 – 3 pt/A) plus an OP for OFM are suggested for control. Maintain alternate middle sprays every 6-7 days. Pyrethroid (Asana, Ambush, Pounce) sprays are considerably less expensive, and may be considered if mites are not an issue. Make sure to use a minimum of 100 gpa in problem blocks.

Apple

Tufted Apple Budmoth (TABM): Mixed stages of larvae are being seen in the field (see peach section). While 80% of observed leaf shelters still had late instar larvae, young second brood larvae were also observed. The second application of Confirm should be targeted for late this week or early next week in southern counties. This material has a 14 day PHI, which should bring it pretty close to red delicious harvest. Confirm is not effective for apple maggot and oriental fruit moth; and while it is effective for codling moth, timing is different. Therefore, when using Confirm, add a reduced rate of an OP or carbamate inscticide to cover other pests. If growers in budmoth areas are not using Confirm, then a Lannate or Lannate/OP combination can be used. In a combination, Lannate should be used at a 1.5 to 2 pt/A rate plus the OP. Growers may find it helpful to continue to treat as close to harvest as possible (Lannate has a 14 day PHI). Bts may also be used, and may be helpful for a last application. PHIs for Bts are usually 'until dry', but check the label.

Oriental Fruit Moth (OFM): Additional tests have been conducted by Peter Shearer on OFM populations taken from apple plantings. While these are early tests, some tolerance to Guthion (an OP) has been seen. Our surveys have shown that where worms are present in the fruit, they are most likely oriental fruit moth. If OFM is a problem, growers have 3 choices in choosing a spray program: 1) Use higher rates of Guthion or other OPs, for example changing from 1.25 to 2 or 2.5 lb/A of Guthion; 2) Use a carbamate such as Lannate in combination with an OP or use a full rate of Lannate in 5-7 day alt. middle applications; or 3) Change to Asana (21 day PHI synthetic pyrethroid). All orchards that have been tested to date have thick trees and have also experienced spray coverage problems. While it may not be practical to thin out the trees this year, opening up the trees with good pruning cuts is a high priority for next year. Growers should also check their sprayer calibration and increase spray volume where possible.

Spotted Tentiform Leafminer (STLM): Recent trap counts range from 1,000 to 2,100 adults per trap. This means that egg laying is well underway, and the mine count should increase over the next week to 10 days. Fresh mines were seen late last week and early this week. Lannate, Vydate and Provado all offer control of early instar larvae. Lannate has been observed to give good control if applied over freshly hatched eggs or newly emerged larvae.

Codling Moth (CM): Trap counts have indicated that insect pressure is high on certain farms. Trap counts are above 5 moths per trap on about 50% of farms in southern counties, and most farms in northern counties.

Summer Diseases and Rots: Both black rot and white rots are being seen, especially on insect-injured fruit. Where coverage has been poor, sooty blotch and fly speck are also present. Sooty blotch and fly speck

See IPM on page 5

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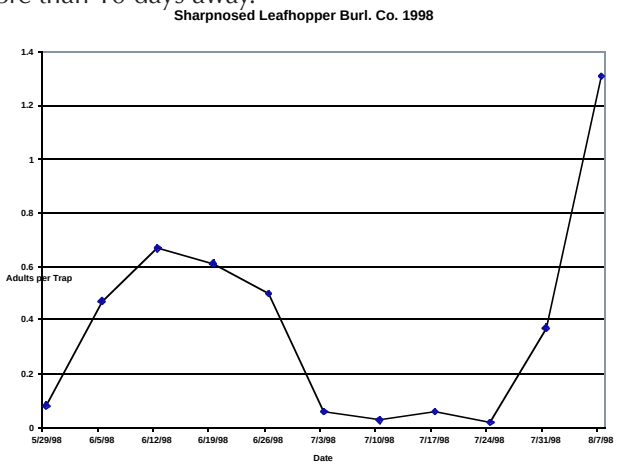
also develop in areas of high humidity or dense foliage. Proper pruning not only helps with spray coverage, but also helps to minimize the disease by providing an 'unfavorable' environment.

Blueberry

Sharpnosed Leafhopper (SNLH): SNLH adult trap counts have increased sharply in Burlington County and slightly in Atlantic County. This is the start of the second generation flight (see graph). SNLH can transmit stunt disease as they move from an infected host, whether wild or cultivated, to an uninfected cultivated bush. Sprays are usually applied when the adult flight is heaviest (usually by the first of September). Given the early season that we are experiencing, second generation applications may need to be applied by late August.

Blueberry Maggot: Adult fly captures increased over the last week. Adults are being found in most of our traps in Atlantic County. One additional treatment may be required on Elliott and other late varieties if picking is more than 10 days away.



Degree Day Accumulations Since Biofix and Spray Targets - Aug 10

Insect	Hammonton	Bridgeton	Hardingville	CreamRidge	Princeton	Oldwick	Pittstown	Hackettstown
OFM	Done	Done	Done	Done	Done	Done	Done	Done
TABM	2659	2649	2684	2540	2520	2480	2256	2122
CM	2088	2125	2142	2044	2013	1973	——	1738

Spray Targets:
OFM 200 & 400 DD_{45} after biofix (1st generation).
TABM 490, 625, 763, 898 DD_{45} after biofix (1st generation). 2228, 2415, 2605, 2795 DD_{45} after biofix (2nd generation).
CM250 DD_{50} after biofix plus 14 days later (1st generation).1250-1300 DD_{50} after biofix plus 14 days later (2nd generation).

Trap Captures

Tree Fruit – South Jersey

WEEK END:	RBLR	STLM	TABM-A	CM	AM	OFM	TABM-P	LPTB	PTB
3-Jul	19.60	943	25.26	1.52	0.05	8.55	30.91	40.69	8.57
10-Jul	4.00	823.08	7.86	1.69	0.03	5.98	12.57	29.53	2.45
17-Jul	1.20	771.58	15.85	3.55	0.16	8.45	33.79	23.02	2.84
24-Jul	2.80	974.89	15.56	4.31	0.43	17.16	23.06	16.21	3.05
31-Jul	7.40	899.65	25.75	6.58	0.38	22.67	33.62	13.70	1.96
7-Aug	4.40	965.04	34.91	4.88	0.19	19.98	42.18	17.53	5.61

Tree Fruit – North Jersey

WEEK END:	RBLR	STLM	TABM-A	CM	AM	OFM	TABM-P	LPTB	PTB
3-Jul	36.41	844	15.20	4.98	0.10	8.05	13.81	25.11	3.77
10-Jul	20.19	649	3.31	1.79	0.32	4.66	4.91	23.88	5.03
17-Jul	9.35	569.54	2.63	1.81	0.11	3.32	1.26	20.29	2.36
24-Jul	7.89	840.20	2.08	4.14	2.75	8.74	2.00	22.22	3.21
31-Jul	5.29	993.92	3.29	10.53	0.46	14.23	4.36	9.12	4.40
7-Aug	9.49	1080	4.17	11.67	0.32	9.73	6.50	7.93	5.00

Blueberry - Atlantic Co.

WEEK END:	RBLR	OBLR	CBFW	SNLH	BBM HIGH	BBM LOW
7/3	20.79	1.0	0.03	0.02	0.34	0.22
7/10	7.35	0.42	0	0	0.3	0.15
7/17	2.79	1.88	0	0.01	0.25	0.12
7/24	13.13	1.87	0	0.01	0.76	0.59
7/31	9.23	2.15	0.00	0.07	0.40	0.19
8/7	6.03	2.75	0.00	0.29	0.90	0.32

Blueberry - Burlington Co.

WEEK END:	RBLR	OBLR	CBFW	SNLH	BBM HIGH	BBM LOW
7/3	23.61	1.31	0.44	0.06	0.35	0.06
7/10	6.56	0.22	0	0.03	0.51	0.16
7/17	2	0.28	0.06	0.06	0.47	0.18
7/24	1.06	2.44	0.22	0.02	0.14	0.06
7/31	1.56	3.94	0.00	0.37	0.13	0.00
8/7	3.39	2.11	0.06	1.31	0.33	0.17

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