

## Implementation

### REDUCING OP AND CARBAMATE USE IN NJ PEACH ORCHARDS

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*Keywords:* oriental fruit moth, *Grapholita molesta*, tarnished plant bug, *Lygus lineolaris*, stink bugs, catfacing damage, peach orchards, mating disruption, ground cover management, reduced risk, conventional orchards, organophosphorus insecticides, carbamate insecticides

**Objective.** Investigate and demonstrate the potential for good ground cover management and mating disruption to reduce insecticide use against key pests.

This 2-year study was implemented at four different orchards. Three sites were located on commercial farms and the fourth site at the Rutgers Agricultural Research and Extension Center, Bridgeton, NJ. At each site, a block of peaches ranging from 4-18 acres was divided in half and each half designated as either conventional (Conv.) or Reduced Risk Peach Arthropod Management Program (RR). Conventional blocks of peaches were farmed using conventional methods while the RR blocks contained managed sod drive rows and mating disruption. Sod was established in the RR blocks to reduce catfacing insect abundance and damage by eliminating flowering broadleaf weeds, which are important alternate host plants of these pests. Mating disruption was initiated between the first and second flight of oriental fruit moth (OFM) and was used as a non-insecticidal control measure against this pest in the RR blocks.

### Results

Fruit quality at harvest is the most meaningful indicator to growers regarding the success of their control program. We collected harvest samples to assess and compare levels of insect damage between the RR and conventional programs. We evaluated 600 fruit per block from trees located in the orchard interior and along the orchard borders for a total of 4,800 fruit across all blocks and treatments. Fruit damage caused by oriental fruit moth was less than one percent and not significantly different from conventional sites. This indicates that mating disruption provided control that was equivalent to conventional grower practices (Table 1). We observed less catfacing damaged fruit in RR blocks in 1999, which is attributed to the clean sod and drive rows that were not attractive to catfacing insects. In 2000, there were not significant differences in catfacing damaged fruit. In 1999, we were surprised to find more stem-end lacewing pupae in the conventionally managed. This seems contrary to what was observed during the visual surveys conducted for beneficial insects during the growing season. However, in 2000, there were not statistical differences in stem-end lacewing pupae between conventional orchards and RR orchards although their abundance increased considerably between the first and second years.

We received the spray records from our grower-cooperators and determined the number of sprays and amount of product applied to each of the two treatments. Results showed that the growers applied 3.7-4.7 fewer organophosphorus and carbamate insecticide sprays and 2.0-4.2

times less AI/acre in Reduced Risk orchards compared with conventionally farmed orchards (Table 2). The reduction in OP and carbamate sprays used in the RR blocks can have significant impact on several factors including less insecticide exposure to the environment and workers and reduced spray bills, while minimizing disruption of natural enemies which can serve as biological control agents of secondary pests.

**Table 1.** Percent damaged fruit collected from orchards managed with different pest management practices

Program	Catfacing insects		Oriental fruit moth		Lacewing pupae	
	1999	2000	1999	2000	1999	2000
Reduced Risk	0.8 ± 0.3 b	3.4 ± 3 ns	0.2 ± 0.1 ns	0.7 ± 0.6 ns	2.4 ± 0.5 b	7.4 ± 2 ns
Conv.	1.6 ± 0.4 a	3.9 ± 3	0.2 ± 0.1	0.1 ± 0.1	4.2 ± 0.7 a	8.9 ± 4

Means in the same column followed by different letters are significantly different ( $P \leq 0.05$ ).

ns=not significantly different.

**Table 2.** Organophosphorus and carbamate use in Reduced Risk and conventional program orchards

Program	Number of applications ± SEM		Amount (lb AI/acre) ± SEM	
	1999	2000	1999	2000
Reduced Risk	2.8 ± 0.3 b	1.9 ± 0.4 b	2.0 ± 0.4 b	1.2 ± 0.2 b
Conventional	6.5 ± 0.5 a	6.6 ± 1.0 a	3.9 ± 1.1 a	5.0 ± 1.0 a

Means in the same column followed by different letters are significantly different ( $P \leq 0.05$ ).

### Conclusions

OFM mating disruption gave at least 4 months of non-insecticidal control of this major pest while using 3.7-4.7 fewer organophosphorus and carbamate insecticide sprays and 2.0-4.2 times less organophosphorus and carbamate insecticides (lb AI/acre) than applied to conventional blocks during 1999 and 2000, respectively.

There was less catfacing damage fruit in orchards with managed sod compared with fruit grown in weedy conventional orchards. The reduction in catfacing damage is attributed to the lack of “preferred” alternate weed host plants and catfacing insects in managed sod blocks when compared to the amount of weeds and catfacing insects found in conventional orchards.