

Implementation

MICHIGAN APPLE IPM IMPLEMENTATION PROJECT—YEAR TWO

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A program to implement economically viable integrated pest management practices and to improve environmental sustainability in Michigan apple production by reducing reliance on broad-spectrum pesticides was initiated in 1999. The project is supported by the Michigan Apple Industry, The Pew Charitable Trusts, the Environmental Protection Agency, Gerber Products, the Center for Agricultural Partnerships, and Michigan State University. The use of selective control tactics is an information intensive management approach that requires significant time be spent in the field with growers to provide training and to help reduce the risk from adopting a new system. The project utilizes extensive industry, extension, and researcher support to conduct intensive hands-on field training of growers, as well as the scouts, consultants, and input suppliers who have traditionally worked with growers in making important management decisions. Emphasis is being placed on improved pest monitoring as a decision making tool, moving growers away from pest management decision making based predominantly on tree phenology. Economics of alternative systems are being evaluated, and pesticide usage and residue on fruit are being measured and recorded.

Participation in the project for the 2000 growing season included 63 growers on 2835 acres across five growing regions of the state. Sixty-one of the 63 growers used mating disruption products plus selective insecticides to control key pests, including codling moth, leafrollers, and oriental fruit moth. Two growers concentrated on reducing broad-spectrum pesticide usage with improved scouting and selective insecticides alone. Selective chemistries effective at controlling some key pests, such as apple maggot and plum curculio, are not yet in place.

Pre-harvest fruit injury samples at 43 farms, where both selective and comparison blocks were sampled, indicated control of codling moth to be at similar levels for both blocks. Control of leafroller was improved in selective insecticide plus mating disruption blocks when compared to blocks without mating disruption (Table 1). Adoption of improved scouting protocols and the use of selective materials in the comparison blocks of second year project growers contributed toward lowered internal and external fruit injury in those blocks when compared to the previous year.

Michigan's humid, temperate climate necessitates numerous fungicide spray applications throughout the season. Sprayable mating disruption products that can be tank mixed along with fungicides are perceived as potentially labor saving and, therefore, potentially more cost effective. Pre-harvest fruit injury samples at thirteen farms with viable comparison blocks

showed improved obliquebanded leafroller control in blocks using sprayable pheromone (Table 2).

To address grower concerns associated with the costs of pest management programs that incorporate the use of mating disruption, an economic model has been developed that uses pre-harvest fruit evaluations and pesticide application records to assess costs (Table 3). Considerations used to develop the economic model include insecticide and miticide inputs, fruit pack-out revenue (as impacted by management program), Michigan Department of Agriculture (MDA) averages for pounds of fruit produced/acre, and MDA average price received for fresh and processed fruit.

Analysis of grower spray records for 2000 is ongoing. Where pest management programs combined the use of mating disruption plus selective insecticides, organophosphate insecticide applications were reduced 33.8%, compared to blocks without mating disruption.

Large-scale adoption of alternative pest management systems is directly related to documenting their effectiveness and economic viability. Economic analysis for both individual growers and for different selective programs is ongoing. The project is funded to run through the 2001 growing season.

Table 1. Preharvest mean fruit injury at 43 farms participating in the MI Apple IPM Project (selective vs. comparison)

Region	No. farms	Codling moth		Leafroller	
		Selective	Comparison	Selective	Comparison
Fruit Ridge	26	0.3	1.5	2.2	3.0
Southeast	8	1.0	0.5	1.5	1.9
Southwest	4	0.1	0.1	1.1	4.4
W. Central	5	0.2	0.6	1.6	6.2

Table 2. Preharvest mean fruit injury at 13 farms using 3M leafroller sprayable pheromone (selective vs. comparison; leafroller sprayable pheromone [3M])

Region	No. farms	% leafroller injury	
		Selective	Comparison
Fruit Ridge	9	4.3	5.6
Southeast	1	0.0	0.0
Southwest	2	0.5	0.6
W. Central	1	6.0	9.0

Table 3. Economic modeling of pest management program costs (mean costs/acre for MD programs 1999 and 2000*; includes cost of pheromone dispensers and labor for placement)

Pheromone	1999			2000		
	No. farms	Selective	Comparison	No. farms	Selective	Comparison
C+	10	\$134.20	\$132.00	9	\$185.05	\$184.02
CM/LR	7	\$266.95	\$241.00	8	\$245.66	\$254.49
OBLR MEC	8	\$180.59	\$205.95	8	\$240.88	\$288.89

*2000 data are incomplete.