

## Progressive planning to address multiple resource concerns: Integrated pest management in Wisconsin orchards

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Wisconsin apple and cherry growers and the University of Wisconsin worked with the USDA Natural Resources Conservation Service (NRCS) to address orchard pest management resource concerns through the Environmental Quality Incentives Program (EQIP). As a result, Wisconsin's EQIP Pest Management Standard was changed to provide orchardists with extended technical assistance and allow for progressive adoption of a spectrum of integrated pest management (IPM) techniques, from relatively basic to advanced. A significant flat-rate incentive payment encouraged growers to address multiple resource concerns through IPM. In just three years, the NRCS processed contracts that provided 31 growers with the resources necessary to implement IPM on 19% of Wisconsin's orchard acres.

### BACKGROUND

In 2003, specialty crop organizations and environmental groups sought to expand EQIP beyond the traditional program (grain and livestock). These groups wished to address pesticide nonpoint source pollution and IPM adoption in specialty crops. Specialty crops—including tree and small fruits, vegetables, and ornamentals—face significant challenges ranging from pests and diseases to aggressive competition from foreign producers. Specialty crops are exceedingly diverse with complex, site-specific production traits and a tendency toward smaller acreages. Many are perennials that require significant capital expenditures for establishment yet yield no crop for several years after planting. Specialty crop producers and processors must meet exacting and highly differentiated quality requirements for their products, adding another level of complexity. Since production and processing are dispersed across the United States rather than concentrated in a few regions, specialty crop

producers lack a unified industry voice. For these and other reasons, government agencies have few incentives and face little pressure to serve specialty crop producers (Specialty Crop Farm Bill Alliance 2007).

Specialty crop growers are encouraged to implement intensive IPM practices to reduce their pesticide use while still addressing the complex array of insect pests and diseases associated with some specialty crops. Unfortunately, the start-up costs of implementing IPM are significant and often discouraging. These costs not only include specialized equipment such as weather monitors and their associated disease and insect pest computer-based models but also the time commitment to learn the science and management strategies behind IPM.

IPM requires systems thinking skills and a problem-solving approach that encourages farmers to build a picture of their farm incrementally, using an iterative decision-making process (Maani and Maharaj 2004). IPM is knowledge intensive, and the learning curve is steep, especially for growers accustomed to applying pesticides on a calendar schedule. Through monitoring pests and diseases, growers can make site-specific decisions based on real-time data instead of a predetermined schedule. Once growers are confident with their IPM skills and trust their decisions, they can add more advanced IPM tools to their repertoire. The desired result is both a reduction in the amount of pesticides being applied and an increased use of "softer" chemistries that are target-specific rather than the broad-spectrum pesticides that are more toxic to nontarget plants, animals, and humans. This advanced stage of using IPM provides multiple benefits to air quality, soil health, ground and surface water, and threatened/endangered species (Brewer 2004).

To date, the EQIP Pest Management Standard (code 595), which addresses resource concerns through IPM, has not been a conservation program priority in any cropping system. Fewer than 1% of the EQIP dollars allocated to grower contracts supported pest management

conservation practices on any type of crop between 1997 (the program's start) and 2002 (Brewer 2004). Furthermore, the Natural Resources Defense Council found little improvement after 2002; only 3% of EQIP funding supported pest management conservation activities in 2005 (Hamerschlag 2007). EQIP has favored structural, engineered practices rather than land management practices, and only a few states wrote contracts recognizing the multiple environmental benefits resulting from IPM (Hamerschlag 2007). In many states, NRCS focuses program dollars on managing the nutrient and livestock waste that is a primary source of water contamination. This focus results in a tendency to fund structural projects such as manure storage pits, fencing, pipelines, and ponds rather than intensive land management practices such as nutrient management, prescribed grazing, and IPM (Hamerschlag 2007).

The US Geological Survey reported in 2006 that 57% of streams surveyed in agricultural areas had pesticide levels exceeding safe standards for aquatic life. Of these streams, 9.6% had pesticide levels exceeding US Environmental Protection Agency (USEPA) benchmarks for human health (US Geological Survey 2006). Compromised water quality was not confined to agricultural areas, as 6.7% of streams and 4.8% of groundwater sites in urban areas also contained pesticides at concentrations exceeding USEPA benchmarks (US Geological Survey 2006). More than 50 studies conducted between 1992 and 2001 found that 96% of fish, 100% of surface water, and 33% of major aquifers contained one or more pesticides (US Geological Survey 2006). These and similar findings encourage environmental and agricultural groups to push for federal conservation programs that address pesticide risk issues through voluntary approaches.

### THE WISCONSIN EXAMPLE

Wisconsin's Eco-Apple project is a joint effort of the Wisconsin Apple Growers Association and its members, private IPM consultants, the University of Wisconsin-Extension and the University of

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Wisconsin-Madison Center for Integrated Agricultural Systems to create local grower networks and individualized IPM coaching to advance the use of IPM in Wisconsin orchards (Center for Integrated Agricultural Systems 2007).

In 2003, Wisconsin's Eco-Apple project was set to start its first field season with 13 growers interested in using IPM to reduce pesticide risk. At the same time the Eco-Apple project was unfolding, the National Apple Growers Association was requesting grower access to federal conservation programs, particularly EQIP. The Wisconsin Apple Growers Association sent the Eco-Apple project team a copy of the request letter from the National Apple Growers Association, which led to the initial conversation between the project team and the Wisconsin NRCS. NRCS invited the Eco-Apple team to begin the process of facilitating state-level changes to EQIP. In the spring of 2004, the Eco-Apple team and growers were invited to present their need for EQIP pest management contracts to the State Technical Committee (STC).

As most STC members were unfamiliar with the apple industry, this presentation explained apple production and growers' current pest management practices. At that time, most orchard growers controlled pests by spraying pesticides every 7 to 14 days to control insects and diseases common in Wisconsin, regardless of their actual threat. An orchard grower in the Midwest can average 27 pesticide applications in a growing season. At this time, the USEPA was considering stronger regulation of the two main pesticides used by orchardists: phosmet (trade name Imidan) and azinphos-methyl (trade name Guthion). Industry leaders could see that growers needed to learn other pest control methods in advance of regulation and possible loss of some pesticide tools.

This presentation persuaded NRCS and STC members to give apple growers special consideration in the administration of EQIP, especially the Pest Management Standard. At that time, the Pest Management Standard was designed for row crops, with the cost-share for adopting IPM set at \$2

to \$4 ac<sup>-1</sup> (\$5 to \$10 ha<sup>-1</sup>). For a high-value, management-intensive crop such as apples, this was an insufficient incentive for EQIP participation. At the suggestion of the STC, the apple and cherry industries teamed up to form the Wisconsin Tree Fruit Subcommittee, which included growers, University of Wisconsin-Extension, the Center for Integrated Agricultural Systems, the Wisconsin Apple Growers Association, and IPM consultants. The subcommittee was charged with proposing changes in the Pest Management Standard to accommodate IPM techniques appropriate for orchards.

The subcommittee felt the STC would be uncomfortable with dramatically increasing the traditional flat-rate payment, the subcommittee assembled an incentive rate to cover only orchard crop scouting. Growers proposed changes to the flat-rate payment based on cost data from IPM consultants. A basic scouting program for insect pests and diseases, including bait traps and hiring an IPM scout, was estimated to cost approximately \$78 ac<sup>-1</sup> (\$193 ha<sup>-1</sup>). For 2005 contracts, the STC approved a pilot flat-rate payment of \$39 ac<sup>-1</sup> (\$96 ha<sup>-1</sup>) for orchards meeting the Pest Management Standard. The state office allocated the pilot \$100,000 that year, which covered four-year EQIP contracts (three years of payment and one year of maintenance) for 13 growers with approximately 850 ac (344.25 ha). This statewide set-aside eliminated the need for orchardists to compete with other farmers for contracts.

In 2006, the pilot's second year, the subcommittee requested more money to cover unforeseen costs of developing required IPM plans and to add additional IPM techniques to the Pest Management Standard for orchards. Through repeated exposure to orchard issues at state meetings, the STC was becoming more familiar with IPM and its potential to address resource concerns.

Orchardists need support over a number of growing seasons to learn how to manage pests with more complex IPM techniques. Technical support is the most critical element to learning this manage-

ment strategy, and the logical approach is progressive planning that extends the availability of technical support beyond the usual four years of the contract while requiring the adoption of increasingly advanced pest management strategies.

Based on this new approach, growers requested—and the Wisconsin state conservationist granted—\$200,000 for fiscal year 2006 EQIP contracts for orchards. However, there was not sufficient time to include the additional IPM techniques, and the flat-rate incentive payment remained at \$39 ac<sup>-1</sup> (\$96 ha<sup>-1</sup>). Thus, many orchardists did not sign up for EQIP in 2006, hedging their bets that the flat-rate payment and the number of IPM techniques supported would increase in 2007. In 2006, only 11 growers with a total of 625 ac (253 ha) were awarded EQIP contracts, leaving \$126,828 of unused funds that were re-allocated to the counties for non-orchard EQIP contracts. As resources for writing plans remained inadequate, the Eco-Apple project worked with the Center for Agricultural Partnerships to cover growers' plan writing costs in 2006.

For the 2007 EQIP signup, the subcommittee refined the progressive planning approach to include two tiers: basic and advanced. The basic tier reflected what a conventional grower could learn and implement during a four-year EQIP contract. Basic IPM techniques included IPM training, scouting, use of weather monitoring equipment to determine degree days and leaf wetness, and other monitoring skills that allow growers to time pesticide applications in accordance with insect emergence and disease outbreaks. The advanced tier offered experienced growers an incentive to adopt more advanced IPM techniques including softer chemistries and biological and cultural controls for insect pests and diseases.

NRCS offered contracts for each tier at the same incentive rate of \$120 ac<sup>-1</sup> (\$296 ha<sup>-1</sup>) with an additional \$1,000 per contract for development of a progressive IPM plan. On a typical farm, the grower, orchard IPM consultant, and NRCS staff worked together to revise this plan each

year of the contract, gradually incorporating more of the IPM techniques listed in the tier requirements.

Growers build confidence and address new resource concerns as they move through each tier. By the time growers complete the advanced tier and are able to use a wide range of biological and cultural management practices, the benefits to natural resources are substantial.

In 2007, the Wisconsin state conservationist recognized the pilot as an official state program. This program was henceforth administered at the local working group (LWG) level instead of the state level. This raised a new set of sensitive issues. The Pest Management Standard primarily interests specialty crop producers and is rarely used by row crop and livestock farmers; therefore, it is infrequently selected as one of the practice standards supported by LWGs. To facilitate change and raise awareness of their needs at the LWG level, orchard growers and their organizations were encouraged to contact their local NRCS district conservationists and express interest in EQIP participation.

The Center for Integrated Agricultural Systems worked with NRCS to develop a two-day seminar and field day on IPM in Wisconsin orchards in 2006. NRCS district and area conservationists, as well as county conservationists were invited to learn from University of Wisconsin-Extension specialists, growers, and IPM consultants. Classroom and field training covered the basics of apple production and IPM. Local growers also attended these trainings, and NRCS district conservationists taught them about the EQIP program, the contract process, and the Pest Management Standard for orchards. This provided an opportunity for the growers to increase their comfort level with NRCS, as many had not worked with the USDA in the past. During this professional development training, LWGs were encouraged to set aside money for orchards. Four counties opted to set up such a pool. As a result, in 2007 county staff signed up seven contracts on 275 ac (111 ha), for \$142,081 total. Although the number of contracts

declined, some of the larger orchards in Wisconsin signed up for EQIP in 2007.

#### WHAT THE FUTURE MAY HOLD

Specialty crop growers are better organized than ever before to help shape the 2008 US farm bill, with the Specialty Crop Farm Bill Alliance playing a key role. This coalition of more than 100 producer organizations developed a comprehensive set of priorities for the farm bill that include strong support for research, conservation, and renewable energy.

Much of the farm bill language on conservation programs directed at specialty crop producers was stripped out of both the House and Senate versions relatively early in the process, despite support from the Specialty Crop Farm Bill Alliance and sustainable agriculture organizations. The exception is the Senate's proposed Conservation Security Program (CSP), which contains specific references to IPM. Other proposed changes to CSP include references to "management intensity" and "resource-specific indices," which have the potential to benefit specialty crop growers since payments would be scaled to reflect differences between cropping systems. Another proposed change removes references to management tiers. Farms must be fully enrolled and meet minimum management standards, but different fields may be managed at different levels of intensity. Budget allocations will determine the ability of CSP to support stewardship on specialty crop farms. The debate on capping annual program payments per farm continues, which could conceivably open the door for more participation by farmers of noncommodity crops. Negotiations on all these points continue as the farm bill is being crafted, with an anticipated completion date of mid- to late-spring 2008 (Midwest Sustainable Agriculture Working Group 2007).

Farm bill discussions have changed the way programs are currently administered. NRCS is concerned that contracts are currently too complex, and an internal push for simplicity is impacting state administration of 2008 contracts. In

Wisconsin, NRCS simplified flat rates for each EQIP practice standard, eliminating the progressive planning of the two-tier system used in 2007 for orchard pest management despite the state conservationist's commitment to planning as perhaps the most potent force in improving resource management on-farm. Growers are no longer allowed to sign up some of their orchard blocks for the basic tier and, at the conclusion of the contract, sign up their remaining orchard blocks for the advanced tier. Growers are required to enroll their entire farms at one time, which puts the burden on NRCS staff, IPM consultants, and growers to decide which IPM techniques they will try during the four-year contract. This change greatly reduces the ability for growers to try softer chemistries as well as biological and cultural pest control strategies as growers new to IPM are not equipped to try these advanced techniques until they have mastered the basics. The end result is an overall reduction in the effectiveness of EQIP in addressing multiple resource concerns. However, once a grower achieves a minimum management standard he or she could move from EQIP to a program such as CSP that rewards excellence in land management.

In 2008, the Wisconsin Pest Management Standard no longer provides a separate payment for IPM plan development. Instead, NRCS added \$15 to the flat-rate payment of \$120—for a total flat-rate payment of \$135 ac<sup>-1</sup> (\$333 ha<sup>-1</sup>). Thus, large orchards will receive adequate funding to aid in IPM plan development, while smaller orchards will face more out-of-pocket expenses. Wisconsin growers were required to sign up for 2008 contracts between September 4 and November 16, 2007. Although the Wisconsin Apple Growers Association sent out an announcement to inform growers about this drastic change from last year's enrollment deadline, this coincided with the apple harvest, making it difficult for growers to get into their NRCS office to apply for EQIP.

## CONCLUSIONS

While we expect federal initiatives to improve specialty crop growers' access to federal conservation programs, state efforts to improve program access and relevance are critical. Nationally, an Extension working group is realigning Extension IPM resources to support state-level changes in federal agricultural programs. Twenty-one Extension agents, NRCS staff, land grant researchers, and nongovernmental organization staff from eight states and Washington DC are holding monthly conference calls to discuss efforts and share experiences. This group is helping other states negotiate similar changes in EQIP for specialty crops.

To date, Wisconsin NRCS holds contracts with 31 farmers on 19% of Wisconsin's orchard acreage. We think EQIP, especially if configured progressively, can help growers implement IPM on most of the state's 9,000 orchard ac (3,600 ha) over the next decade.

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