AREAWIDE ORGANIC PEST MANAGEMENT
The Peshastin Creek Pear Project

John E. Dunley, Bruce M. Greenfield, and Tara Madsen
Tree Fruit Research and Extension Center
Washington State University

INTRODUCTION
Present pest control programs for pear are largely based on chemical controls that destroy beneficial as well as pest arthropods within the orchard (Figure 5). Biological control of pests is an attractive option, providing sustainable pest management while producing many unmonitored side effects. However, while biological control is the optimal sustainable approach to reduce the use of insecticides in pear, biological control alone cannot currently control any of the major arthropod pests of pear. Thus, to obtain a long-term stable pest management program in pears, research is necessary to develop a consistently effective integrated program that coordinates chemical control with biological control, and also uses cultural and chemical control practices.

A small percentage of Washington pear growers (approx. 7%) have already chosen to become organically-certified, using past management programs that rely solely on these more biologically-intensive pest management strategies and tactics. The number of organic crop growers in Washington has increased dramatically since 1991, largely due to the success of organically-producing orchardists, with a long-term demonstration program in the middle of conventional production (Figure 1-3).

Establishment of organic orchards in the middle of conventional production programs that rely solely on these more biologically-intensive pest management programs and tactics is proving very difficult and costly, and served as a major barrier to developing more environmentally-friendly IPM programs.

PM programs for areawide use of mating disruption for codling moth control (CAMP), initiated in 1995, have been shown to be very effective in managing codling moth. Currently, a large USDA FAS/RAMP research project (Peshastin B) is underway to extend the benefits of mating disruption, primarily by developing softer IPM programs that enhance biological control in pear fruit (Figure 4).

Successful implementation of organic production has not been successful in any cropping systems. Organic pear production may particularly be appropriate for areawide implementation. The major pests of pear, codling moth and pear psylla, each have pest management tactics available that make areawide organic management possible: mating disruption for codling moth, and kaolin (Surround) for pear psylla. Successful areawide management of codling moth has already been demonstrated; areawide management of pear psylla using kaolin has been effective since 2000.

There are some additional benefits to implementing organic production on an areawide basis, rather than orchard by orchard. Foremost is enhancing the opportunities for integration of natural enemies. Most natural enemies of pear pests are opportunistic, and immigrate from non-fruiting areas. Integration of organic production with other organic production programs in the region could enhance the abundance of natural enemies that will be adjacent to native vegetation, typically along the margins of production areas. Establishment of organic orchards in the middle of conventional production areas will have more difficulty encouraging biocidal agents, as less selective past management programs in the conventional orchards will likely isolate the organic orchards from the native vegetation. Areawide implementation of softer organic programs will provide ‘windows’ for biocidal agents to immigrate to the interior of production areas.

In February 2002, a group of twelve family farms along the Peshastin Creek watershed of the upper Wenatchee Valley of Washington formed the Peshastin Creek Growers Association. This Association comprises approximately 210 acres of contiguous pear orchards located in a narrow valley, surrounded by native woodland and bordered by State Highway 97 and Peshastin Creek.

PEST MANAGEMENT PROGRAMS
Comparisons were made of pest and natural enemy densities among three pest management programs: Organic, Soft, and Conventional. Peshastin Creek growers approx. 100 ac of pear were Certified Organic, 130 ac were under a soft program, and 22 ac were maintained as conventional.

The Organic program was limited to those materials approved under organic certification. The Soft program used the same insecticides as the Organic program, however growers were allowed to use other non-organic materials if necessary. For alternatives treatments, the first choice was always an insect growth regulator, maintaining the object of preserving natural enemy populations. The Conventional program followed standard recommendations for pear production in the area. Conventional programs allowed growers to use various organic insecticides for codling moth control.

Sampling for pest and natural enemy densities was conducted throughout the project biweekly. Samples were collected at 21 locations: 6 Organic, 13 Soft, and 4 conventional. Locations were biased toward Soft, as orchards under this program could shift to either Organic or Conventional during the season.

RESULTS

**RESULTS and DISCUSSION**
There were no significant differences in pear psylla control through the season between the Organic, Soft, and Conventional orchards (Figures 1-3). Pear psylla nymphs, the damaging stage, peaked in early August and some honeydew was found on fruit, however this occurred in all three programs in 2002.

Spider mites also caused limited damage in all treatments (Figures 4). Acaricides were used in all Conventional orchards, as well as 33% of the Soft orchards. No differences were found in codling moth damage among programs. Coding moth pressure within the project has historically been low.

There were no differences found in natural enemy population densities. Levels of natural enemies were very low throughout the season in all programs.

A preliminary analysis of costs did not show statistically significant differences between programs (Figure 5). However, further analysis is necessary to examine the economics of each program.

Overall, past management was obtained in the Organic and Soft programs relative to the Conventional program. While this is the first year of a 3+-year study, the demonstration that there is potential to move larger acreages to organic management and soft, more environmentally-friendly insect pest management. While demonstrating economic benefits of softening past management programs may prove challenging, areawide organic programs may provide an avenue for developing freelinking-IFM programs.

Update for 2003 Season
The 2003 season will see the continuation of pest monitoring in the orchards of the Peshastin Creek Growers Association, with sampling expanded from 15 to 21 sites, all of which are based on grower-identified blocks.

A new phytophthora study is also being begun this year. Trench sampling will be used to measure predator density through the gradient from native vegetation into orchard vegetation. Also, direct measurements of biological control activity will be made in orchards and surrounding vegetation, using exclusion cages with sentinel pear psylla eggs and syringe along transects. We will seek out components of biological control in both Organic and Conventional systems.

Thanks to the Peshastin Creek Growers Association.