

## **A Report for the Kentucky IPM Program**

### **Kentucky Apple IPM and Food Safety: Model Farm to Fork Quality Assurance Program**

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**TECHNICIAN:** Kerry Kirk

**OBJECTIVES:** To train apple producers and their employees to use practical and appropriate IPM, food safety and quality assurance procedures during the production, harvest, processing and marketing of apples grown in Kentucky. This program had three components: (1) Train and assist producers to adopt integrated pest management (IPM) procedures in order to assure a minimal likelihood of pesticide residues on the fruit, (2) provide educational materials to farm laborers in order to minimize the potential for microbial contamination of the fruit during harvest, grading storage and marketing, and (3) provide training to apple cider producers and assist them in the development of Good Agricultural Practices and Good Manufacturing Practices plans to ensure that basic procedures that prevent microbial contamination of cider that can cause food-borne illnesses are understood.

**PROJECT SUMMARY:** The 2000 Apple Total Quality Assurance, funded by Kentucky Partnership for Food Safety and Quality Assurance and the Kentucky IPM program, involved Kentucky apple growers in the application of food safety and other Integrated Pest Management practices in the management of their orchards and processing areas. This represents a complete farm to fork production system educational program.

There were 5 major components in the program in 2000:

- 1) Apple growers were surveyed to identify current food safety and IPM practices.
- 2) Growers were trained to monitor their own orchards for pest problems and use IPM as a framework for decision making to minimize pesticide applications.
- 3) Development of an easy to read brochure describing the basic components and benefits of the TQA program for apples.
- 4) Incorporation of fresh produce food safety education for producers attending apple TQA/IPM workshops, and commodity group meetings.
- 5) Provided relevant food safety training for cider producers and assist individual producers in the development of GMP and HACCP plans.

A total of 110 apple growers received written surveys to identify production and processing practices. Few surveys were returned, so Ms. Kirk relied on orchard visits and telephone calls to complete the survey process. Growers responded to 62 questions regarding their use of production and processing practices that could affect food safety, pest management, or environmental contamination. The survey indicated that our apple growers are doing a good job of implementing IPM and protecting against microbial contamination. However, the survey also indicated that there are some key practices that need to be

improved or adopted. This includes the need for more use of soil tests and foliar analysis to manage nutrients, greater adoption of pheromone traps to monitor codling moth and time insecticide applications, the need to sanitize apples prior to juicing (particularly where pasteurization is not used), coding of juice containers in case of product recall, use of expiration dates on juice containers, increase the use of cider pasteurization, and instruction of employees to minimize the likelihood of microbial contamination during harvest. This important information obtained through the survey is being used to direct educational efforts to ensure food safety in our orchards.

Three orchard meetings and one classroom meeting for growers provided an opportunity for the extension and research specialists to address relevant apple TQA/IPM issues and for the growers to discuss concerns in an informal setting. A portion of these meetings have been set aside for roundtable discussions led by the growers, these have been popular and the topics timely. These meetings included a hands-on IPM and Food safety exercises which included touring production and pasteurization facilities and discussion of Good Agricultural Practices (GAP's) for apple production and Good Manufacturing Practices (GMP's) for cider production. During the three field meetings, computer monitoring equipment and models were demonstrated and codling moth pheromone traps were distributed to growers. Kentucky Apple IPM Manuals were distributed to growers for use in scouting and implementing IPM decision making in their orchards. Attendance at the apple IPM field days was very good with a total of 186 participants including 55 women. It may be noted that apple IPM meetings are not new and this is the tenth consecutive year of training. Attendance has remained constant over that period. On average, apple growers implementing IPM are able to reduce pesticide inputs by approximately one third and improve the level of pest control through improved application timing and reduced disruption of natural enemies. An e-mail discussion group, [apalert@ca.uky.edu](mailto:apalert@ca.uky.edu), has been used to notify growers about timely pest management information. Ms. Kirk has also been collecting disease monitoring data, running disease-forecasting models, and distributing alerts to growers.

An easy-to-read brochure describing the key components of the TQA program has been developed and will be sent to Ag Communications for printing this fall in time for our winter horticulture meetings in Lexington. The primary audience for this brochure is the Kentucky apple producer, but the brochure is written in a manner that it can also be distributed at local markets to concerned consumers. This brochure informs consumers that IPM is a tool that allows growers to reduce pesticide usage such that pesticides are only used on an as-needed basis and as the last line of defense. Apple producers are also using other biologically-intensive management practices such as sanitation, pruning, and biological control to control these perennial pest problems. The brochure also describes important practices (GAP's and GMP's) that growers use to reduce the chances of harmful microbial contamination. It is hoped that this brochure will help to maintain consumer confidence in Kentucky-grown produce. As apple production in Kentucky represents a high pesticide usage crop, a crop marketed directly to the consumer, and a crop that is processed and has had a history of serious microbial contamination in other parts of the country, this brochure can be used as a model for other fresh-market and processed crops that are marketed directly to the consumer.

This past year there were several new pesticide restrictions placed on apple growers as a result of the implementation of the Food Quality Protection Act (FQPA) of 1996. The EPA restricted the use of three commonly used apple insecticides, Guthion, Lorsban, and Carzol and eliminated the use of another, Penncap-M. This represents a shift away from broad spectrum insecticides toward highly-specific insect growth regulators. This will place a greater importance on the need to monitor orchards regularly and use IPM effectively.

Low-literacy and non-English food safety educational materials illustrating appropriate personal hygiene practices were obtained from Cornell University and distributed to producers at the first orchard meeting in the spring. While it was part of the project proposal that these materials would be developed and distributed, it was determined that it would not be necessary to develop new materials as those that existed were adequate. These materials are intended to be displayed by producers in production areas, near toilet

facilities, and other places where part and full-time farm employees congregate. It has been suggested that poor personal hygiene by field workers can be an additional mechanism of microbial contamination.

## **Performance Goal Indicators**

1. Apple Acreage in Kentucky
  - Total apple acreage is 2000 acres (2000 estimate).
  - Total apple acreage using at least an entry level IPM program is 1400 (70% grower survey).
2. Pesticide applications (based on a 1998 survey of spray records from 13 IPM growers)
  - A. Total pounds of formulated pesticide applied to IPM acreage:
    - Fungicides: 53,381
    - Insecticides: 32,711
    - Bactericides: 2202
  - B. Average number of pesticide applications (based on grower surveys)
    - Fungicide: 11.2
    - Insecticide: 10.6
    - Bactericide: 1.7
3. Yield and dollar value of IPM apple crop (based on 1999-2000 KY Ag. Statistics, 1998 and 2000 grower surveys, and specialist estimates).
  - A. Total yield: 5,600,000 lbs. (Based on 8,000,000 lbs total production)
  - B. Total value: \$1,792,000 (These numbers decreased from 1999 due to a reduced crop in central KY)
4. Agricultural producers trained during 2000 (Based attendance at the 3 meetings and specialist estimates)
  - A. Apple producers trained: 80.
  - B. Apple producers who have or plan to adopt IPM: 56 (51 old, 5 new).
  - C. Apple producers who adopted IPM practices within 6 months of being trained: 3.