

DEVELOPMENT OF IPM TRAINING MATERIALS FOR URBAN APPLE GROWERS

Final Report

PROJECT LEADERS:

Ric Bessin, Extension Entomologist
Jerry Brown, Extension Horticulturist
John Hartman, Extension Plant Pathologist
Doug Johnson, IPM Coordinator
John Strang, Extension Horticulturist
Terry Jones, Extension Horticulturist

COMMUNITY EDUCATORS:

Robert White	Terry Jones
Jeff Haniford	Kelly Hutchens
Shelly A. Nold	Mike Klahr
Bev Fogel	Donna Michael
Susan Des Ruisseaux	Peter Bodnar
Dawn Ripley	Roy Ballard

OTHER PARTICIPANTS:

57 backyard/hobbyist apple growers from seven pilot counties where the program was initiated.

OBJECTIVE:

The specific objective of this proposal is to develop training materials that can be used to deliver IPM programs to backyard and hobbyist apple growers. This involves adapting, where appropriate, and extending commercial apple IPM strategies to homeowner fruit plantings augmented with additional cultural controls which have not been practical for commercial apple production.

INTRODUCTION:

Homeowners plant apple trees for a variety of reasons: for the benefit of fresh fruit, for control over what pesticides are applied, or perhaps for nostalgic reasons. Attempts at apple growing are frequently met with disappointment because trees and pests are poorly managed. Growers are frequently unaware of potential pest problems and management options. Knowing that pests are likely to appear, some use excessive amounts of fruit spray mixtures and are left wondering whether or not their apples are safe. Home fruit growers able to produce quality fruit with reduced pesticide usage can be satisfied that they are consuming a healthful food and contributing to a safer environment.

The use of pesticides in the urban environment is a major concern among many homeowners. Additionally, with increasing awareness of food safety and pesticide use, many home fruit growers want to make use of techniques to more efficiently use pesticides and diminish these concerns. Some homeowners fail to grow a good apple crop due to a lack of understanding of apple and pest biology and a lack of knowledge of effective tools to control apple problems. Common apple pests such as fire blight, plum curculio, codling moth, San Jose scale, and rosy

apple aphid can severely damage trees and/or fruit in an urban planting. Other urban fruit growers, using heavy doses of pesticides, may grow good quality apples but are not aware that IPM technologies could be used to good effect to improve control and reduce pesticide usage.

Home fruit growers have fewer chemical apple pest control alternatives available than do commercial growers. Yet, the greatest range in pesticide use is exhibited in the urban setting. However, the home grower is not bound by market-quality standards nor the economic justification of certain cultural practices. Thus, the homeowner may have greater flexibility in the use of apple IPM. Traditionally, IPM educational programs have been developed for commercial agriculture and have not been adapted the urban public.

SUMMARY:

Each participant completed a survey at the beginning of the program. The results of the survey, some of which were unexpected, indicated their basic knowledge and experience, primary pest problems, extent of their apple plantings, fruit growing expectations, and their comfort with using pesticides. The results of this survey were used to help design the IPM program to best meet the needs of our participants.

The specific objectives are listed below, and the extent to which these objectives have been reached is discussed with each objective.

a) Extend apple IPM to non-commercial plantings and establish pest predictive systems in selected urban apple plantings.

Three hobby orchards were selected in Shelby county, Kentucky for demonstration of backyard apple IPM. Training sessions for the community educators were conducted within these orchards. Many different IPM approaches were demonstrated and evaluated including the following practices:

Disease resistant cultivars: Liberty, Prima, and Macfree.

Pest monitoring: Pheromone trapping and weather monitoring were use as predictive indicators for management of codling moth, San Jose scale, fire blight, and apple scab.

Plastic Canopies: Similar to rain-flies, these plastic shelters were used to reduce spread for fire blight inoculum during bloom by protecting the trees from rainfall. While the canopies may have reduced the spread of the inoculum by rainfall, the incidence of fire blight was unaffected probably due to insect transmission.

Fruit bagging: Young fruit were hand thinned and enclosed in paper bags to prevent infestation by codling moth and plum curculio. Bags developed in Japan for this purpose were found to be very effective in not only reducing damage by these insect pests, but also in controlling fly speck and improving the finish of the fruit.

Weed control: The use of various mulched (straw, newspaper and pine bark, and pine bark alone) were compared with herbicide treatments beneath the trees.

Exclusionary netting: Finely woven plastic netting was used to protect dwarf trees from attack by Japanese beetle, green june beetle, birds, and wasps.

Pruning: Proper pruning techniques, as they relate to modifying conditions that favor the development of disease and insect problems, were demonstrated to the community educators.

Sanitation: The importance of through and timely sanitation was stressed at each of these locations. Sanitation

included the cleanup and disposal of premature fruit drops, pruning trash, fruit mummies, and fallen leaves at the end of the season.

b) *Prepare an apple IPM instructional video directed toward non-commercial growers.*

The videotape "Backyard Apple Integrated Pest Management (22:00) produced through this grant was sent to state Extension Fruit Specialists (1/2" VHS copies) to copy, distribute and use as they wish. Specialists from the following midwestern and midsouth states now have the videotape: Illinois, Indiana, Iowa, Kansas, Kentucky, Missouri, Ohio, and Tennessee. The videotape will be shown in late 1995 at the annual Midwest Fruit Specialists Conference, and has already been used for educational programs at statewide fruit grower conferences.

c) *Develop an easy to understand urban IPM apple manual demonstrating how to use IPM systems in non-commercial settings.*

A 59-page manual, *Kentucky Backyard Apple Integrated Pest Management Manual*, was developed and distributed to program participants. This manual included an introduction to IPM and a section on how to set their own goals for success. More information was included on the proper horticultural management because an initial survey (Appendix 1) indicated a strong need for this among the participants. For each specific disease and arthropod problem explained, a list of IPM management alternatives were presented. Preventive cultural controls were strongly emphasized. Pesticide safety and record keeping were also addressed.

d) *Prepare a slide set to be used by local Master Gardeners, CES personnel, and other facilitators for training meetings.*

An instructional slide set was prepared to illustrate apple IPM practices. This slide set focuses on horticultural, disease and insect management in the backyard setting. The final segment of the slide set provides a chronological summary of what gardeners need to do based on tree phenology.

e) *Conduct training programs for Master Gardeners, CES personnel, and other community facilitator through hands-on workshops, field days, and annual statewide meetings. These individuals will function as trainers in their communities.*

A series of training workshops, one winter and four summer meetings, were conducted for the community educators. These meetings were arranged so that these community educators could hold their own county meetings just after the workshops. The workshops were intended to be as hands-on as possible, participants were involved in the specific IPM demonstrations as well as roundtable discussions.

f) *Make educational materials developed available to Extension and IPM programs in other surrounding states.*

Materials developed in this program have been sent to the appropriate extension personnel in surrounding states in the southeast and midwest.

A pre-program survey of backyard apple growers (Appendix 1) provided valuable insights that enabled us to better design this IPM program to suit their needs. On average, these growers had more apple trees than were initially anticipated, with an overall mean of 22.3 trees per grower. They recognized insect and disease management, pruning, and fruit thinning and size to be their major production problems. Quality of the fruit is more of a concern than total fruit yield. Most felt somewhat comfortable with pesticides, but as a group, they were willing to trade more labor for less pesticides.

Appendix 1. Backyard Apple IPM Pre-Survey (31 responses collected from 57 participants)

3. What are your expectations or reasons for participating in this program.

- a. grow higher quality fruit (23)
- b. reduce pesticides (17)
- c. grow more fruit (5)
- d. improve knowledge and skills (27)
- e. county agent talked me into it (0)
- f. other (0)

4. Do you currently grow apples?

- yes (29) no (2)
- If so, how many trees?** mean = 22.3

- 1-5 (7)
- 6-9 (7)
- 10-19 (5)
- 20-29 (3)
- 30-39 (1)
- 40-49 (4)
- 50-100 (1)
- 100+ (1, 200 trees!)

Do you plan to plant new trees or replace old trees with disease resistant cultivars?

- yes (21) no (9)

Average hours per month (pruning through harvest) you expend producing apples?

- a. <5 (11)
- b. 5-10 (11)
- c. 10-20 (4)
- d. >20 (3)

5. Why do you grow apples?

- a. eating and cooking (27)
- b. to give away (18)
- c. control use of pesticides (5)
- d. enjoyment (22)
- e. other children, for sale, challenge of growing them, for the horses

6. What are your major production problems?

- diseases (16)
- insects (15)
- pruning and shaping the tree (19)
- fruit thinning (6)

fruit too small	(10)
rotted fruit	(3)
poor tree growth	(1)
do not know	(2)
pollination	(0)
no fruit	(0)
dead trees	(0)
other	(0)

7. Do you know cause(s) of your current problems?

yes (4) no (15)

Neglect, fertilization, pests, scab, thinning, Japanese beetles, cedar apple rust, fire blight, insects, diseases, aphids, codling moth.

8. Characterize your apple growing approach.

a. careful attention to details	(4)
b. prune and spray every few weeks	(12)
c. spray once or twice a year	(9)
d. manage trees without spraying	(1)
e. total neglect	(4)

9. Please rate the following according to your interest in that subject (1=very high, 2-high, 3-moderate, 4-low, 5=none)

a. variety selection	(2.71)
b. pruning apples	(1.75)
c. diseases	(1.71)
d. cultural controls	(2.36)
e. chemical controls	(2.46)
f. landscaping	(3.62)
g. fertilizing	(2.75)
h. insects	(1.86)
i. biocontrol	(2.86)

10. What level of fruit blemishes are you willing to tolerate?

a. high	(2)
b. medium	(17)
c. low	(8)
d. none	(1)

11. What level of fruit production do you hope to obtain with this program?

Yield expectation?

a. high	(4)
b. medium	(19)
c. low	(1)

Quality expectation?

- a. high (13)
- b. medium (11)
- c. low (0)

12. Are you comfortable with pesticides?

- a. yes (9)
- b. no (3)
- c. somewhat (15)

Which of the following concepts makes you most comfortable using pesticides?

- a. improve timing (16)
- b. improve pesticide selection (15)
- c. lower toxicity pesticides (16)
- d. organic pesticides (6)
- e. no pesticides (2)

13. Indicate to what extent you are willing to try alternatives for less pesticide use?

- a. more labor (13)
- b. pest barriers (8)
- c. collect and use information (16)
- d. changing varieties (5)
- e. reduce fruit quantity (9)
- f. reduce quality of fruit (3)
- g. all of the above (7)
- h. none of the above (3)