



## Meeting the Challenges of Growing Organic Fruit



*This high-density organic apple orchard in Pascoe, Washington, is trained on trellises in a "V" shape. The open centers of the trees permit efficient photosynthesis as well as extensive air circulation to reduce fungal diseases. Photo: Rex Dufour, NCAT*

### Home Acres Orchard, Stevensville, Montana

Adapted from an article by Tammy Hinman, NCAT Horticulture Specialist, in *Apples: Organic Production Guide*

When Pam Clevenger and Kurt Welborne began growing fruit in rural western Montana in 1990, there were lots of produce farms but no organic tree fruit production in the area, although historically lots of apples were grown in the region. Pam and Kurt say there is definitely a demand for organic fruit, but marginal growing conditions are the biggest limitation.

The region may experience hard early frosts, hard late frosts, or extended periods of warm weather in January. The farm is dependent on snowpack for irrigation, and in a dry year the irrigation water may run out in early August, when temperatures are often over 90° F. Since the weather is

particularly hard on new trees, they use only semi-dwarf rootstock, the roots of which are more effective at foraging for water and withstanding high winds.

Pam and Kurt grow about 20 varieties of apples, three varieties of Asian pears, six varieties of European pears, and three varieties of apricots. They also grow tart cherries and plums for their own use. They say the Asian pears have extra boron demands but otherwise are trouble-free compared to apples. The pear trees are interspersed among the apples, which they believe helps keep their insect and disease problems down.

The farmers also use wildscaping, particularly around the perimeter of the orchard. The wildscaping has enhanced pollination, but also increased the number of birds that feed on apples.

For codling moth, Pam and Kurt rely primarily on Spinosad®, a biological control, along with pheromone

emitters for mating disruption. They spray *Bacillus thuringiensis* several times in the spring for leaf rollers. They have brought in lacewings in past years to help control aphids, but now there seems to be a strong resident population that pretty much keeps the aphids in check. They use copper and lime sulfur for fire blight and scab.

Pam and Kurt have experimented with different fertility treatments over the years, including alfalfa pellets and feathermeal. Last summer the farmers cut hay from their own pastures and mulched their trees with a mixture of clover, alfalfa, and grass. They add sulfur regularly to the soil and spray boron, calcium, and zinc to boost these nutrients on their farm.

Interestingly, despite following organic practices, Home Acres Orchard is no longer certified organic. Pam and Kurt have joined with other growers in the region to form the Montana Sustainable Growers' Union, which promotes its products under its own Homegrown label. They still get a premium price for their fruit and sell their products through two farmers markets, a local natural food store, and the Western Montana Growers Co-op.

Overall, says Kurt, "Some years you're lucky, some years you're not." He and Pam note there are lots of rewards that aren't monetary.

## Resources for Organic Fruit Producers

### Nationwide

- *The Apple Grower* and *The Holistic Orchard* by Michael Phillips and *Twenty Years of Apple Production Under an Ecological Approach to Pest Management* by Ron Prokopy are excellent guide books for transitioning to organic production.
- **Holistic Orchard Network** shares sustainable fruit-growing techniques with an emphasis on orchard soil health. <http://groworganicapples.com>
- **North American Fruit Explorers** offers services to members, such as fruit and nut interest groups, special consultants in various fields, and a good quarterly publication, *Pomona*. [www.nafex.org](http://www.nafex.org)
- *Good Fruit Grower* magazine has been published by the Washington State Fruit Commission since 1946. [www.goodfruit.com](http://www.goodfruit.com)
- *American/Western Fruit Grower* magazine and website provide news on all aspects of the fruit-growing industry. [www.growingproduce.com](http://www.growingproduce.com)
- *Fruit Growers News* is based in Michigan but reports on fruit developments around the world. <http://fruitgrowersnews.com>

### Regional

- **Appalachian Fruit Research Station** helps solve production issues for the region's fruit growers. [www.ars.usda.gov/naa/afrs](http://www.ars.usda.gov/naa/afrs)
- **California Rare Fruit Growers** includes members from all over the globe who share knowledge about fruit cultivation, "pushing the limits and range of fruit growing worldwide." [www.crfg.org](http://www.crfg.org)
- **University of California Fruit & Nut Research and Information Center** coordinates statewide extension efforts to improve orchard production. <http://fruitsandnuts.ucdavis.edu>
- **Midwest Organic Tree Fruit Growers Network** is a nonprofit organization working to advance the industry. <http://organicreefruit.org>
- **Northeastern IPM Center for Fruit** covers 12 states from Maine to W. Virginia. [www.northeastipm.org/ipm-in-action/ipmresources/resources-database](http://www.northeastipm.org/ipm-in-action/ipmresources/resources-database)
- **OrganicA** is a resource for organic apple producers in New England. [www.uvm.edu/%7Eorganica](http://www.uvm.edu/%7Eorganica)
- **Virtual Orchard** brings together many resources for fruit growers in the eastern U.S. [www.virtualorchard.net](http://www.virtualorchard.net)

### New and Updated ATTRA Publications

- Crop Insurance Options for Specialty, Diversified, and Organic Farmers IP438
- Social Media Tools for Farm Product Marketing IP435
- Tips for Marketing Sheep and Goat Products: Dairy IP396
- Tips for Marketing Sheep and Goat Products: Live Animals IP398
- Tips for Marketing Sheep and Goat Products: Meat IP399
- Tips for Marketing Sheep and Goat Products: Vegetation Management IP403

### Featured ATTRA Publication Equipment and Tools for Small-Scale Intensive Crop Production IP417

This publication shows how tractors and implements designed for small-scale intensive crop production can increase crop quality and yields while reducing labor inputs. Learn how factors such as soil type and crop selection play an important role in the utilization of farm equipment. Sections discuss the following topics relevant to small-scale farms:

- Hand tools
- Tractors, PTOs, and toolbars
- Walk-behind tractors
- Soil preparation
- Seeding and planting
- Weed management



### ATTRA Resources for Fruit Growers

The following ATTRA publications and resources include useful information for fruit growers. These and many more can be found in the horticulture section of ATTRA's website, [www.attra.ncat.org/horticultural.html](http://www.attra.ncat.org/horticultural.html). Call 800-346-9140 for a printed copy. Prices vary and many resources are free.

- Biorationals: Ecological Pest Management Database (online only)
- Apples: Organic Production Guide IP020

- Biointensive Integrated Pest Management IP049
- Blueberries: Organic Production IP021
- Farmscaping to Enhance Biological Control CT065
- Grapes: Organic Production IP031
- Guía Ilustrada para Producir Alimentos Seguros en su Granja: Buenas Prácticas Agrícolas SP382 (Spanish version of the following publication)
- Illustrated Guide to Growing Safe Produce on Your Farm: Good Agricultural Practices (GAPs) IP382
- Organic Culture of Bramble Fruits IP022
- Organic Crops Workbook: A Guide to Sustainable and Allowed Practices IP225
- Organic Orchard, Vineyard, and Berry Crop Documentation Forms IP238

- Organic Standards for Crop Production: Excerpts of USDA's National Organic Program Regulations IP332
- Pawpaw — A "Tropical" Fruit for Temperate Climates IP373
- Peaches: Organic and Low-Spray Production IP047
- Pears: Organic Production IP167
- Persimmons, Asian and American IP375
- Postharvest Handling of Fruits and Vegetables IP116
- Strawberries: Organic Production IP046
- Fresas: Producción Orgánica SP246 (Spanish version of Strawberries, above)
- Sustainable Pecan Production IP077
- Tips for Selling to Grocery Stores IP424
- Tips for Selling to Produce Distributors IP431
- Tree Fruits: Organic Production IP028

# Managing Pests and Diseases in Organic Orchards

Adapted from articles by NCAT Horticulture Specialists Guy Ames and Tammy Hinman

## Apples

Apples are prone to attack by an impressive number of pests and diseases. Without effective management, the worst of these pests can be devastating — to the fruit, to the grower's spirit, and to the bottom line.

To minimize or eliminate chemical inputs while keeping yields and profits sound, the grower must develop a detailed understanding of the orchard as a managed ecosystem. There is no substitute for direct observation and experience, along with a willingness to experiment. As the organic market for apples increases, more organic management options are available to growers.

Geographic and climatic considerations, cultivar selection, the local pest complex, market prices, production costs, and other factors all influence the design and viability of an organic system. Individual producers must try various tools and evaluate them according to efficacy, cost, production, marketing goals, and personal preferences.

What begins as a fragmented pest-by-pest set of tactics must gradually form an overall management plan in which the various strategies work together as much as possible. Obstacles to organic production include the following:

- Cultural guidelines for controlling one pest may create conditions that favor another pest.
- Many organic pest-control tactics tend to give highly variable results from location to location and from year to year.
- Traditional local support services are often unable to provide much information or guidance.
- The practices may be labor and/or capital intensive.

## European and Asian Pears

In much of the United States, with the availability of fire-blight resistant cultivars, pears may be the easiest of the major tree fruits to produce organically or with minimal spraying.

## Geographic Factors Affecting Disease and Pest Management

West of the "tree line" (which runs roughly from Fort Worth, Texas, to Fargo, North Dakota), a major insect pest of many tree fruits — the plum curculio — is not present. This fact, along with reduced disease pressure due to lower humidity, simplifies organic production of apples and other fruit in much of the West.

Growers in the eastern part of the country, on the other hand, must contend with the plum curculio and increased incidence of fungal diseases. Northeastern growers have the apple maggot as an additional major pest. In the Southeast, the various fruit rots can be especially troublesome.

The prognosis for eastern organic apple production is starting to look up, however. Through a combination of innovative pest-management strategies and diligent research, many of the issues associated with organic apple production in the East are beginning to be resolved.

Surround® WP, a kaolin-clay based pesticide, has dramatically changed the face of organic fruit production in the eastern United States. These control measures require intensive management, though, and growers need to account for additional pest-management time and expense in their enterprise budgets.

Pear fertility requirements are not high. The trees are adapted to a wide range of climates and soils, but have fewer pest problems than other tree fruits. The orchards are subject to most of the same pests and diseases as apples, but usually to a considerably lesser degree. However, fire blight can still be a problem on pear trees all over the country.

Standard cultural considerations, such as pruning, planting, spacing, and thinning, are generally the same for organic and conventional growers. Most European pears are picked before they are fully ripe and are then allowed to ripen off the tree. The most widely grown varieties are Bartlett, Bosc, D'Anjou, Seckel, Magness, Maxine, Moonglow, and Comice.

In the last two to three decades, the Asian pear has joined the more familiar European pears in American orchards and the marketplace. Asian pears are generally round, crisp, and juicy, with flavors varying between sweet, bland, and pineapple-like.

The trees are cultivated in much the same way as European pears, but the fruit is allowed to ripen on the trees. Common cultivars include Shinseiki, Korean Giant, Shinko, Chojuro, Nii-taka, Clear Moon, Shin-Li, and Tsu Li.

## Peaches

Intense disease and insect pressure makes peaches one of the most difficult tree fruits to produce organically. In parts of the arid West, commercial organic peach production is feasible when the grower adequately addresses brown rot, peach twig borers, and Oriental fruit moth.

In most of the East, organic production is greatly complicated by the plum curculio and brown rot. At present, there is virtually no significant organic peach production in the East. However, with new pest-management tools, organic peach production, or at least a more ecologically grounded system, is becoming far more plausible than it was just a few years ago. Meanwhile, low-spray production with limited use of the least-toxic synthetic inputs is a proven alternative for eastern growers.

For more information about organic fruit production, see these new and revised ATTRA publications by Guy Ames and Tammy Hinman.

- Apples: Organic Production Guide
- Peaches: Organic and Low-Spray Production
- Pears: Organic Production



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## Pest, Weed, and Fertility Benefits of Pastured Poultry in Orchards, by Rex Dufour, NCAT Agriculture Specialist

The weed seed bank on most farms is contained in the top few inches of the soil. Many insect pests also spend at least a part of their life cycle (generally, but not always the pupal stage) in the upper few inches of the soil. This is likely the reason that chickens evolved their scratching behavior — to search for small tidbits of food in the rich upper layers of the soil.

Farmers can use poultry to help manage insect pests and weeds in their orchards or cropping systems. Most orchard pests such as codling moth, plum curculio, fruit flies, thrips, and other lepidopteran pests (leaf rollers, leaf miners...it's a long list) spend a part of their life cycle in the "chicken-scratch depth" of the soil.

Certainly there are significant management considerations to having poultry in the orchard or field, such as how often to move the birds, the

size and configuration of the moveable pens, and how to assure protection from predators. See ATTRA's many resources on poultry for more information about these questions, [www.attra.ncat.org/attra-pub/poultry/](http://www.attra.ncat.org/attra-pub/poultry/).

In addition to pest-control benefits, chickens can provide much-needed fertility, particularly phosphorus, to soils. But the birds' presence needs to be managed to prevent phosphorus or nitrogen run-off.

A typical meat bird will provide 15 pounds of manure during its short life. The N-P-K value of this manure is about 40 cents/bird — not very much, unless you're raising a lot of birds or you're an organic farmer looking for nonchemical sources of soil nutrients. One laying hen will provide about 22 pounds of manure a year. The manure contributes to soil fertility and supports soil biology as an added benefit.

## ATTRAnews

Carl Little, Project Manager  
Karen Van Epen, Editor

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