

Asian and European Pears

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Introduction

Very few European pears (*Pyrus communis*) are grown commercially in Kentucky, primarily due to problems with fire blight and late spring frosts. Asian pears (*P. pyrifolia*, synonym *P. serotina*), on the other hand, are more consistently productive in Kentucky in spite of these problems. Also called apple pears, Asian pears are crisp and juicy like an apple, but with the sweetness associated with pears.

Marketing and Market Outlook

Per capita consumption of fresh pears in the U.S. fell to 2.9 pounds in 2010, the first time in five years that it was less than three pounds. Fresh pear consumption stayed under three pounds from 2012 to 2016, and total pear consumption (fresh and canned) stayed under five pounds during that time. Production for fresh markets is steadier than processing volumes, which are more likely to show large changes from year to year.

Kentucky-grown pears are mainly marketed through roadside markets and local retail outlets. The niche market for fresh Asian pears in Kentucky has grown since 2005, as more trees have matured to bearing age.

Production Considerations

Cultivar selection

Most of the Asian pear cultivars that are available in this country originated in Japan. These have rounded, apple-shaped fruit, with either smooth or russeted skin. Japanese cultivars ripen at various times during the July to October harvest season in Kentucky. Chinese cultivars are more pear-shaped with smooth, green skin when ripe. Chinese varieties ripen late in the season. Asian pear cultivars can vary in their reaction to fire blight from moderately resistant to very susceptible. The 'Korean Giant' or 'Olympic' cultivar which ripens late in the season tends to be one of the more fire blight resistant cultivars for Kentucky production.



Asian Pears

European cultivars vary in shape and juiciness, as well as skin color and texture. Resistance to fire blight and/or scab, in addition to some physiological disorders, is available. Only fire blight resistant cultivars should be planted in Kentucky.

Site selection and planting

Select an orchard site that is considerably higher than surrounding areas with excellent air drainage. Slopes that face east or north are best. Noxious perennial weeds should be eliminated from the site prior to planting trees. While most pear rootstocks can withstand somewhat poorly drained soils, well-drained soils are best. Proximity to a good water source for irrigation and spray water is highly desirable. Nitrogen application rates are intentionally kept low on pears to reduce fire blight susceptibility.

Most Kentucky growers are planting pears with standard or semi-dwarf rootstocks. Pears are usually sold as one-year old, branched trees or unbranched whips which can be planted in late winter or early spring. Semi-dwarf rootstocks, which produce a tree that is two-thirds the size of a standard tree, are resistant to fire blight (such as OH X F 87) are preferred for European pears. *Pyrus betulifolia* (BET) seedling rootstocks are preferred for Asian pears as they increase fruit size. Rootstocks that dwarf European pears do not dwarf Asian pears. Asian pears are trained to a multiple leader or modified central leader system.

Approximately 218 to 242 trees are planted per acre. To ensure sufficient fruit set in commercial orchards, two or more compatible varieties should be planted together for cross-pollination. However, Asian pears have a tendency to set such a heavy crop that thinning to one fruit every 6 to 8 inches along the branches will be necessary. Thinning

ensures that the fruit sizes-up and develops a high sugar content; it also reduces stress to the tree.



European Pears



Asian Pears

Pest management

The most prevalent and potentially devastating disease of pears is fire blight. Control methods include choosing cultivars with resistance, surgical pruning, and bactericide sprays. Insect pests include pear psylla, codling moth, mites, stink bugs, and aphids. Stink bugs, which are a particular problem on Asian pears, create a hard spot in the fruit where feeding occurs.

Integrated Pest Management (IPM) helps growers determine exactly when pesticide applications are needed. IPM involves collecting detailed data regarding the crop, pests, and weather conditions in order to make sound pest management decisions. Weather data can be collected with either manual or automated instruments. Predictive models to determine when to spray for fire blight, sooty blotch and fly speck, codling

moth and San Jose Scale using Kentucky Mesonet and NWS data are available on the UK Ag Weather Center site.

Harvest and storage

European pears are harvested before they are fully ripe at the “firm mature” stage. Depending on the cultivar, they can be stored from 2 to 4 months at the proper temperature and relative humidity. European pears require a ripening period at room temperature before being ready for consumption.

Asian pears, on the other hand, are allowed to ripen on the tree. They are ready to harvest when they change color and develop the sweetness and flavor characteristic of each cultivar. Fruit must be handled carefully to prevent bruising of the tender, ripe fruit. Asian pears can be stored 1 to 3 months under the proper conditions.

Labor requirements

An acre of pears will require approximately 150 to 200 hours of labor to establish over the first 5 years.

An experienced pear picker can harvest 10 to 14 bushels of pears per hour. At a yield of 400 bushels per acre, this will require about 40 hours per acre of harvest labor. On-farm packing and grading will require additional labor (15 to 25 hours per acre), depending on the packaging used. On-farm retailers can minimize packing labor by field sorting and having customers select their own pears from retail bins. Asian pears bruise easily and must be handled carefully.

Economic Considerations

Initial investments include land preparation, purchase of trees, tree establishment, and installation of an irrigation system. A good sprayer for insect and disease control will also be needed. Besides significant start-up costs and demanding management, there is a time lapse of at least 3 years after planting before the first harvest is realized. Full production generally will not occur until the seventh year.

Initial harvests of 50 pears per three-year-old Asian pear tree can be expected to increase to 200 to 250 pears per tree on seven-year old trees and 500 to 700 pears per tree on large, mature trees over 10 years old. The price paid for Asian pears is sometimes as high as \$1.00 per fruit, exceeding that price at some retailers. Assuming a price of \$20 to \$40 per bushel and 400-bushel yields, sales from an acre of mature pear trees can range from \$8,000 to \$16,000, depending greatly on varieties, yields, and price. Variable costs for production in a full-bearing year can exceed \$5,000 per acre, including labor costs. Annual non-cash costs (e.g. depreciation on cooling and

irrigation equipment, management, etc.) may typically add \$1,000 or more per year. Depreciation costs can be greater depending on the type of field monitoring instruments and cold storage units used. Unless premium direct or niche markets can be obtained, larger-scale pear production in Kentucky ranks below other tree fruits for returns to land, labor, and management.

References/Resources:

- Ag Weather Center Disease and Insect Prediction Models (University of Kentucky)
http://weather.uky.edu/plant_disease.html
- Kentucky Mesonet (Western Kentucky University)
<http://www.kymesonet.org/index.html>
- Midwest Tree Fruit Pest Management Handbook, ID-93 (University of Kentucky et al., 1993)
<http://www2.ca.uky.edu/agcomm/pubs/id/id93/id93.htm>
- Midwest Fruit Pest Management Guide, ID-232 (University of Kentucky et al.) 2 MB file
<http://plantpathology.ca.uky.edu/files/id-232.pdf>
- Rootstocks for Kentucky Fruit Trees (University of Kentucky, 2011)
<http://www.ca.uky.edu/agc/pubs/ho/ho82/ho82.pdf>
- Asian Pears (Purdue University, 1990)
<http://www.hort.purdue.edu/newcrop/proceedings1990/v1-304.html>
- Asian Pear Culture in Alabama (Alabama Cooperative Extension, 1999)
<http://www.aces.edu/dept/peaches/pearasiancult.html>
- Pears: Organic Production (ATTRA, 2012) <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=7>

Suggested Citation:

Kaiser, C. and M. Ernst. (2018). *Asian and European Pears*. CCD-CP-3. Lexington, KY: Center for Crop Diversification, University of Kentucky College of Agriculture, Food and Environment. Available: https://ccd.uky.edu/sites/default/files/2024-11/ccd-cp-003_asian-and-european-pears.pdf

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