



Plums

Cheryl Kaiser¹ and Matt Ernst²

Introduction

Plums, like peaches, are stone fruits and in the Rose family. These two crops have similar cultural requirements, as well as similar disease and pest concerns. Plums are also sensitive to late spring frosts, which can result in crop losses in Kentucky. Depending on the type and cultivar, plums can be consumed fresh, canned, frozen, processed in jams and jellies, and dried.

Marketing

Kentucky plums are currently grown for the following fresh market outlets: farmers markets, roadside markets, local retail outlets, and community supported agriculture (CSA) subscriptions. Plums can also be sold at produce auctions and marketed through farm-to-institution programs. Value-added plum products, such as preserves, can help extend the market season. Like all new enterprises, growers should define their markets before planting, especially for crops such as plums that have a limited market.

Market Outlook

Per capita fresh plum availability remained relatively constant from 1970 before declining during the 2000s. Fresh plum availability in the U.S. was just 0.57 pounds in 2013, down from 1.25 pounds in 2012/13. Prune availability reached a low in 2008 but then increased, from about 0.75 pounds to 1.25 pounds. Marketers in recent years have emphasized dried prunes as health-conscious, sweet snacks, with beneficial fiber content and nutritional profiles.

Plum production in Kentucky remains a risky endeavor because trees frequently suffer losses when a spring freeze



occurs during bloom. Because fruit production is unpredictable, growers should not consider plums as a primary crop. Instead, plums are best grown commercially only as a secondary fruit crop (to peaches, for example), or as part of a diversified farming operation. Additionally, growers have found that the market is limited, so extensive plantings are not recommended.



Production considerations

Cultivar selection

Selecting hardy cultivars that bloom late, produce quality fruit, perform

¹Cheryl Kaiser is a former Extension Associate with the Center for Crop Diversification.

²Matt Ernst is an independent contractor with the Center for Crop Diversification.

reliably, and meet the market demand is a critical step in establishing a plum planting in Kentucky.

There are three main types of plums grown in Kentucky: European (*Prunus domestica*), Damson (*P. insititia*), and Japanese (*P. salicina*). Of these, late-blooming cultivars of the European and Damson types generally perform best under Kentucky conditions. Damsons are mainly used for culinary purposes due to small size and tart flavor. The familiar Stanley cultivar is a European plum. Most Japanese (or Oriental) plums bloom so early that they generally suffer losses from frost. However, there are exceptions: one commercial orchardist in Kentucky considers the cultivar Shiro one of his more consistent bearers.

Plums are considered freestone (the flesh easily separates from the pit), semi-freestone, or clingstone (the flesh clings to the pit). There is considerable variation in fruit skin color (e.g. red, purple, blue, green, and yellow) and flesh color (e.g. white to red) among cultivars. Other fruit traits that can differ include flavor, size, shape (round, oval, and heart-shaped), and firmness. Cultivars also vary in their disease resistance, days to harvest, and required chilling hours. Plum planting stock is produced commercially by budding or grafting a desired cultivar onto a seedling rootstock. Plums are generally grafted onto the myrobalan or cherry plum rootstock, but rootstocks may also be seedling Lovell or Halford peaches.

Some plum cultivars are self-fruitful, but most are self-incompatible and will require cross pollination with a different plum cultivar that blooms at a similar time. Generally, commercial orchards grow two or more cultivars for cross pollination purposes.

Site selection and planting

Selection of the orchard site is one of the most important decisions in plum production. The orchard should be considerably higher than surrounding areas, with good slopes suitable for air drainage. A gentle slope is ideal; however, if the site is terraced, a steeper

slope can be used. Slopes should preferably face east, southeast, or northeast. Avoid protected areas, such as near wood lots, since these obstruct air flow and allow frost pockets to form. Plums do well on a wide variety of soil types; however, they will not tolerate heavy, poorly drained soils.

Planting stock consists of 3- to 6-foot tall trees with a 3/8- to 3/4-inch diameter trunk. Plums are best planted in the early spring in Kentucky. Equipment size and ultimate desired tree size are factors to consider in tree spacing.



Pruning, which opens the canopy for more effective pesticide coverage and removes diseased and otherwise unproductive limbs, should be done during dormancy. Training is used to develop and maintain tree size and shape. Plums are trained to a modified central leader or an open vase. Because trees often set more fruit than can be matured to a desirable

size, plums may be thinned. Thinning should not be done until all danger of frost has passed. Irrigation may be necessary for young trees during the first year after planting and for established trees during a drought.

Plums are mainly pollinated by honeybees, bumblebees, orchard bees, and large flies. Some flowering weeds and wildflowers contain more nectar sugar than plum blossoms. For this reason, mowing the orchard during the plum bloom period can help reduce competition from these other nectar sources.

Pest Management

Brown rot, bacterial spot, black knot, and plum pockets occur routinely in Kentucky. Insect pests include oriental fruit moth, plum curculio, brown marmorated stink bug and borers. An extensive regular preventative spray schedule must be followed to control insect and disease problems and to ensure high-quality fruit. Rabbits, mice and deer will eat the bark and are especially problematic during establishment. Plum growers use cultivation, herbicides, organic mulches, and cover crops in their orchard weed management program.

Harvest and Storage

A useful indicator of fruit ripeness is color; however, skin color does vary with each cultivar. Knowledge of the cultivar, coupled with experience, can help growers correlate fruit color with flavor and readiness for harvest. An additional indication of ripeness is the softening of the flesh, a change that occurs as the color develops. Plums do not sweeten significantly after harvest. Fruit can be stored at the proper temperature and relative humidity for two to four weeks.

Labor requirements

Plum production requires considerable hand labor for pruning, thinning, and harvesting fruit. Labor needs are approximately 40 hours per acre during the year of land preparation (year 0) and 32 hours per acre during planting and establishment (year 1). Fourteen hours per acre plus an additional 15 minutes of pruning per tree are required for general production in years 2 and 3. During the fruit bearing years (year 3+), labor needs for production and harvest total 100 hours per acre plus 1½ hours per tree for pruning.

Economic considerations

There is a significant start-up cost, demanding management, and a time lapse of at least three years after planting before the first harvest is realized. Full production generally will not occur until the 10th year. While the initial investment may be large, well-tended trees should last 15 to 20 years; Japanese plums generally have a shorter longevity of eight to 10 years.

Initial investments include land preparation, purchase of plants, and tree establishment. A good sprayer for insect and disease control is one of the most expensive equipment items needed. Other significant start-up expenses can include pest control costs for young trees and purchase of cold storage facilities for direct retailing.

Total costs from land preparation to bearing age

(years 0 through 3) are estimated at \$6,300 per acre. Production and harvest costs for bearing trees (3+ years) are estimated at \$2,850 per acre. Based on a conservative price of \$0.50 per pound, about \$32 per bushel, estimated returns above total costs for full-bearing plum trees will be \$3,000 to \$4,000 per acre. This results in an expected payback period for establishment costs of eight to 10 years after planting. Tree fruit U-Pick operations have the potential to reduce harvest costs and increase returns above total costs by 30 to 60 percent per acre. Producers should have a clearly defined market before investing in the establishment costs for this relatively minor perennial fruit crop.

Selected Resources

- Midwest Fruit Pest Management Guide (University of Kentucky, et al., 2017) https://ag.purdue.edu/hla/Hort/Pages/sfg_sprayguide.aspx
- Growing Peaches in Kentucky (University of Kentucky, 2007) <http://www.ca.uky.edu/agc/pubs/ho/ho57/ho57.pdf>
- Growing Plums in Florida (University of Florida, 2016) <http://edis.ifas.ufl.edu/hs250>
- Plum Cultivars – European and Japanese (Ontario Ministry of Agriculture, Food and Rural Affairs, 2007) <http://www.omafra.gov.on.ca/english/crops/facts/07-039.htm>
- Plums (Agricultural Marketing Resource Center, 2015) <http://www.agmrc.org/commodities-products/fruits/plums/>
- USDA/ERS Food Availability Data System <https://www.ers.usda.gov/data-products/food-availability-per-capita-data-system/>

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Reviewed by John Strang, UK Extension Specialist
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