Plums

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 a crop such as plums that has a limited market.

Market Outlook
Per capita fresh plum consumption has remained relatively constant since 1970. prune consumption has declined over the same period in spite of efforts to promote the health benefits (antioxidants, high fiber, etc.) of the dried fruit. In an attempt to overcome the stigma of their name, many prunes have been marketed as “dried plums” since 2001.

Plum production in Kentucky remains a risky endeavor since 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 only grown commercially as a secondary fruit crop (to peaches, for example) or as part of a diversified farming operation. Additionally, current 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 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 their 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 is done by striking the tree with a padded pole (or a variation of this method) or by hand but 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, 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 (from peach profile)
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 hour 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 $6,200 per acre. Production and harvest costs for bearing trees (3+ years) are estimated at $2,600 per acre. Based on a very conservative price of $0.50 per pound* of plums, expected returns above total costs for full-bearing plum trees are in the $4,000 range. This results in an expected payback period for establishment costs of eight to 10 years. 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 Tree Fruit Spray Guide, ID-92**
  (University of Kentucky et al., 2013) 2 MB file
- **Growing Peaches in Kentucky** (University of Kentucky, 2007)
- **Midwest Tree Fruit Pest Management Handbook, ID-93** (University of Kentucky, et al., 1993)
  [http://www.ca.uky.edu/agc/pubs/id/id93/id93.htm](http://www.ca.uky.edu/agc/pubs/id/id93/id93.htm)
- **Rootstocks for Kentucky Fruit Trees** (University of Kentucky, 2011)
  [http://www.ca.uky.edu/agc/pubs/hq/hq82/hq82.pdf](http://www.ca.uky.edu/agc/pubs/hq/hq82/hq82.pdf)
- **Growing Plums in Florida** (University of Florida, 2009)
  [http://edis.ifas.ufl.edu/hs250](http://edis.ifas.ufl.edu/hs250)
- **Plum Cultivars – European and Japanese**
  (Ontario Ministry of Agriculture, Food and Rural Affairs, 2007)
- **Plums: A Guide to Selection and Use** (Ohio State University)
  [http://ohioline.osu.edu/hyg-fact/1000/1404.html](http://ohioline.osu.edu/hyg-fact/1000/1404.html)

*Note: The average plum price turned in to the USDA Farm Service Agency for the 2010 Kentucky crop was $1.64 per pound.*