

SPECIALTY CROPS PROFILE: INTRODUCTION TO WALNUTS, PECANS AND OTHER NUT CROPS

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Nut crops such as walnuts (*Juglans nigra*) and pecans (*Carya illinoensis*) have potential for small-scale production and direct marketing in many parts of Virginia. Growing and handling are specialized, and while marketing is niche oriented, demand can be good for fresh, high quality nuts, used both for eating out of hand and for cooking purposes.

There are many different edible nut species found and gathered in the wild such as hickory (Shellbark-Shagbark, *Carya* sp.), butternuts (*Juglans cinera*) and even acorns (*Quercus* spp.). Chestnut (*Castanea dentata*) is another once-plentiful native nut, but because of Chestnut Blight Disease, it is now a rare find in the woods. The disease resistant Chinese Chestnut (*C. mollissima*) is often planted as a replacement. Yet by far the most widely grown and domesticated native species are black walnut and pecan.

English walnut (also called Carpathian, Persian walnut, *Juglans regia*), almond (*Prunus amygdalus*) and hazelnut (*Corylus avellana*) represent significant cultivated nut production, yet they are limited to specific adaptive areas. California is the leading producer of English walnut as well as almonds, while Oregon growers produce 95% of all hazelnuts. English walnut can be grown in many areas of Virginia, but intolerance to excessive heat, and late spring frost damage to blossoms limits its commercial appeal. In the east, hazelnuts are also referred to as filberts, and there are several wild species found with a shrubby habit of growth. Nut production on eastern filberts is variable, and highly affected by weather conditions in the winter. Typically flowers (catkins) open in late winter to early spring, and though frost tolerant, they can be damaged by hard freezing weather.

Commercially, southern pecan (also known as paper shell type) is the most important nut crop for the Eastern US, followed by wild gathered native black walnut. The pecan industry is centered in the south and southeast, with Georgia a leading state, and in the southern plains, many acres are raised in Texas and Oklahoma, and even as far west as New Mexico. Variety development for southern pecan has been extensive, and they are renown for their large size and very thin shells. They do however require a long growing season to properly fill their nuts, and only the shortest season varieties could be grown here.

A significant wild black walnut industry exists in this country, and it is dominated by a single processor in Missouri, which extracts nutmeats, grades by size of pieces, and sells the product for culinary (cooking) use. In general black walnut is too astringent to be eaten fresh, but this quality lends a unique flavor characteristic when used in cooking. This company purchases wild black walnuts in the Midwest and Eastern US through a network of temporary buying stations manned by local collaborators. Truckloads of wild black walnut in the husk are purchased by the pound at these stations, with a range in prices (.03-.10 cents/pound) given to those who gather. The collaborators typically coordinate buying, temporary storage and shipping with the company for a percentage of the sale price and volume. Interested collaborators can contact the company to determine the nearest buying station and the feasibility of new site location. Send me an email (abratsch@vt.edu), and I can forward this contact information to you.

Native black walnuts are found in most parts of the state. There are a number of improved black walnut varietal selections from the wild, and from limited breeding programs. In general, timber characteristics (faster growth) has been the focus of these programs. Dual use potential for black walnut varieties for timber and as a high quality nut crop is an important characteristic. There are several outstanding black walnut varieties known for their nut qualities, including 'Sparrow', 'Emma K', 'Rupert', 'Hay' and 'Kwik Crop'. The latter is often used as an understock (rootstock) for grafting. Researchers at Purdue University have developed a line of black walnuts known for their faster growth for timber purposes, as well as predictable nut bearing habits.

The northern pecan is a native of the Ohio, Wabash and upper Mississippi river basins, and in recent years a number of outstanding selections have been made from the wild. The northern pecan is known for its high quality nutmeat, which has more oil content and better flavor than the southern types. They do however have much smaller nuts in comparison. While native (northern) pecans are not as common in Virginia as in the Midwest, they may find adaptability in many parts of the state, including middle and southern piedmont regions. Northern pecans are noted for their cold hardiness, later flowering to avoid frost, and reduced nut maturity period as compared to the southern pecan. They are also more disease resistant and experience less insect pressure. For the far Southside and southeast, a shorter season southern pecan may be adapted, but spring frost may be a critical issue for early flowers, as well as bud damage from cold. The northern pecan selections have fair to good nut size (though at best 50-60% of the southern pecan). Careful selection has brought great variety improvement over trees found in the wild. As mentioned, its primary advantage from a marketing standpoint is much richer flavor, due in large part to its higher oil content. From both a fresh eating and culinary standpoint it is superior, while its smaller size, thicker shell, more difficult meat removal and lower crackout % are drawbacks in comparison to the southern pecan. Some examples of northern pecan varieties with improved nut qualities include 'Colby', 'Major' (see Figure 1), 'Norton', 'Peruque', 'Chetopa', 'Pawnee', 'Kanza' and 'Starking Giant'. The variety 'Colby' is frequently used as a rootstock for grafting. These varieties have average nut weights of 6-7 grams, and a percent kernel crackout of 43-60%.

In past years, acquiring of black walnut and northern pecan varieties in the form of nursery stock has been a challenge. Wild selections must be propagated vegetatively to retain their characteristics. For orchard plantings the selected variety is grafted onto pre-planted seedling rootstock, which has usually been growing in the field for 1-2 years. Historically propagation has largely been a province of nut tree enthusiasts and hobbyist, and a handful of small nurseries that have bothered to deal with grafted nut trees. They generally are difficult to graft, and successful outcome requires skill and practice, otherwise the percentage take is low. In addition the window for grafting is narrow, and the propagator needs to have on hand the scion (top) wood of the selected variety when the sap begins to flow. Recently, several larger nurseries have begun wider propagation of northern pecan and black walnut, and certain named varieties are now available as potted and pre-grafted trees.

Trees typically take 7-12 years to come into full bearing, and can easily produce for 40 years or more. Pre-grafted trees bear faster (but are more expensive), and named varieties tend to be more consistent in their bearing from year to year. Expect yields to top at around 1200-1500lbs/acre. Production and harvest operations can be mechanized, and little hand labor is needed except for sorting and packing operations.

Nut trees, particularly named varieties of black walnut and northern pecan have potential for small-scale, direct market production in Virginia. Keep in mind little is known about how the named varieties will perform in Virginia's diverse geography and climates. However as a starting point, good site selection is imperative, and well-drained, deep soils are important for success. One must have an understanding of the frost potential and season growing length as related to the flowering and fruiting characteristics of the chosen variety.

The following are good sites to visit on the web for further reading:

1. Minor Fruits and Nuts in Georgia - <http://www.ces.uga.edu/pubcd/b992-w.htm>
2. Walnuts for Food, Walnuts For Wood- http://www.gov.on.ca/OMAFRA/english/crops/facts/info_walnuts_food.htm
3. Planting Black Walnut for Timber - <http://www.oznet.ksu.edu/library/forst2/samplers/L731.asp>
4. Growing Pecans in Kansas - <http://www.oznet.ksu.edu/library/hort2/mf1025.pdf>
5. Pecan Diseases and Their Control - <http://www.cahe.nmsu.edu/pubs/h/h-645.pdf>
6. Georgia IPM Guide for Pecans - <http://www.gaipm.org/pecan/>
7. About Walnuts - <http://www.uga.edu/fruit/walnut.htm>



Figure 1. 'Major' Northern Pecan. Note rounded shape. Photo courtesy Texas A&M University.

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