THE FABULOUS FILBERT

In the plant world, where oddity is commonplace, the filbert, *Corylus*, stands out because it has so many unusual traits:

- The filbert blooms in midwinter in the areas where it is commercially produced.
- Six months can elapse between pollination and fertilization.
- At the time of pollination, the rudimentary flower has no ovary.
- When the filbert nut has completed its development, its apex is over a year older than its base.
- Commercial filbert production is restricted to limited areas of Turkey, Italy, Spain, and the Pacific Northwest, yet members of the genus *Corylus* are widely distributed throughout the northern hemisphere.
- The plant is thought never to go dormant because in mild climatic areas it exhibits some type of growth the year around.

The filbert of commerce is *C. avellana* L., the European filbert. It was one of the first shrubs to appear on the European Continent following the receding glaciers of the Pleistocene ice age. From 8000 to 5500 BC, the filbert reigned as the dominant vegetation of northern Europe: in peat bogs of that era, filbert pollen outnumbered all other kinds combined by 75%. Currently, filberts thrive under cultivation in areas whose climates are influenced by large bodies of water, e.g., the Black Sea coast of Turkey, the Mediterranean coasts of Italy and Spain, and the coastal valleys of Oregon and Washington. Although soils and topography differ greatly in these areas, their common denominator is climate: Cool summers and mild winters.

The European filbert was introduced to the west coast of the U.S. about 1885. It found an ecological niche in Oregon’s Willamette Valley, the major area of U.S. production. Here some of the world’s largest filberts are produced. A growing export market now exists for these larger nuts to Europe. Filberts occupy 10,000 ha in the Pacific Northwest, with at least four times as much suitable land available for planting. The U.S. imports 45% of the filberts it consumes annually, so there is a ready market for the home grown product. There has never been a complete crop failure with filberts.

The dry, raw filbert is a good, mild-flavored nut and an excellent source of protein. Its oil reserves are triglycerides, which contribute to its excellent storage quality. Roasting enhances the filbert flavor by changing the flavor chemistry. Thus far, in the U.S., filberts have mostly been sold to consumers raw and in the shell or to bakers and salters as kernels. The U.S. production is not yet adequate to furnish kernels for large-scale marketing of a convenience-packaged, roasted, salted filbert. In Europe, 80% of the filberts produced go into chocolate candy manufacture.

Filbert production is almost completely mechanized, from the time the planting hole is dug until harvest. Many growers operate 5 to 15 ha on a part-time basis with family help. Compared with other orchard crops, the filbert requires relatively little maintenance once it is established. However, this gem of a nut is not without its flaws.

The U.S. filbert industry has developed around a single cultivar, ‘Barcelona’, so the strengths and weaknesses of this cultivar are the strengths and weaknesses of the industry. ‘Barcelona’ is prone to produce empty shells, called blanks, which reduce the yield and are a nuisance to separate from the sound nuts. ‘Barcelona’ is productive, but its kernel percentage is only about 40%. Other, more productive cultivars, with higher kernel percentages, are gradually being introduced to the trade.

Filbert trees are difficult to graft, so they are propagated by simple layerage. This inefficient method with its high investment costs slows the introduction of new cultivars. Grown naturally, the filbert is a bush, but in the U.S. it is trained as a single-trunk tree to facilitate mechanization of production. This trunk produces suckers that must be removed several times each growing season.

Eastern filbert blight, a fungal disease indigenous to the areas where its host, *C. americana* Marsh., is native, has now been found in a few Washington and Oregon orchards. The European filbert is highly susceptible to this disease, for which no control is known. Nearly 50 years of quarantine have kept the disease out of the Pacific Northwest, but it now threatens the industry. Fortunately, this disease appears to spread relatively slowly, so there is hope that it can be contained until control measures are developed. The filbert is biennial bearing in each country where it is grown. Because not all countries are on the same cycle, orderly world marketing is difficult. Biennial bearing also discourages the development of new product lines in the U.S., because in a short crop year, the domestic supply is insufficient. Since nut production depends upon the amount of stem growth in the previous year, control of stem growth is used to minimize wide fluctuations in annual nut yield.

Filbert cultivars are self-incompatible, so a pollinizer is essential. About 10% of the Northwest pollinizers are ‘Daviana’, a cultivar with a long nut, a thin shell, and susceptibility to a gall-forming mite. Its yield is poor and, because the market is based on round nuts, the long ones must be screened out.

The Oregon State Filbert Commission has supported a varietal improvement program at Oregon State University. The objective of this program is to develop productive, mite-resistant pollinizer selections with round nuts and large main crop selections with a high percentage kernel.

Since 1928, the U.S. Department of Agriculture has maintained a laboratory to study the major cultural problems of nut crops in the Pacific Northwest. Mutation breeding is being utilized to develop a compact filbert, one with short internodes, suited to high-density plantings. A nonsuckering rootstock is being sought via interspecific hybridization of the European filbert and the Turkish tree hazel. Propagation by grafting and budding is being improved to provide nurserymen with greater flexibility in tree production and greater responsiveness to changes in cultivar demand. A new propagation technique will be the key to a future wedding of new cultivars with nonsuckering rootstocks, i.e., a merging of three areas of filbert research.

The unusual floral biology of the filbert is being studied to determine the time of pistillate flower initiation, the effect of growth regulators on flower initiation and cluster set, and the reason(s) for blanks. In addition, programs address herbicide evaluation, Eastern filbert blight, wound paints, sunscald protection, tree spacing, aids to mechanical harvesting, sucker control, irrigation, aphid control, and mechanical pruning methods.

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