

AUTUMN OLIVE: WEED OR NEW CASH CROP?

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Autumn olive (scientific name: *Elaeagnus umbellata*) is a large shrub growing 10 to 15 feet tall and up to 20 feet across. Plants are readily identifiable by the distinct silvery color of the leaves, particularly on the underside, the small pale-yellow fragrant flowers that emerge in April, and the red berries that ripen in autumn (Figure 1). Other common names for the plant include: autumn elaeagnus, asiatic oleaster, umbellate oleaster, aki-gumi and Japanese silverberry. Native to China, Korea and Japan, the plant was originally brought to North America in 1830. The plants are relatively fast growing, tolerant of drought, saline soils, and of soil pH ranging from alkaline to acid. The roots also form a nitrogen-fixing symbiotic relationship with Frankia bacteria, similar to the relationship between legume plants and Rhizobia. These characteristics make autumn olive particularly adapted to low-fertility loamy and sandy soils. As a result, the plants were distributed by the **Figure 1.** Autumnberry with ripe fruit.

U.S. Soil Conservation Service and planted widely for windbreaks, and to attract wildlife. Mature shrubs can produce large numbers of small (0.3 inch diameter) red fruits that ripen in September and October. The fruit have a unique sweet-tart flavor when ripe, but human consumption in the U.S. is limited. Birds are attracted by the ripe fruit and subsequently scatter the seeds. As a result, wild plants are found growing throughout the Eastern U.S. In the mid-Atlantic region the shrubs are commonly found along roadsides and fencerows.



It was recently discovered that the fruit contain high amounts of lycopene, a carotenoid pigment most commonly associated with tomato. Lycopene content of autumn olive fruit averages about 40 to 50 mg/100g, compared to 3 mg/100g for fresh raw tomato and 10 mg/100g for canned whole tomato (Figure 2). Lycopene is considered an important phytonutrient, and is thought to prevent or fight cancer of the prostate, mouth, throat and skin, and to reduce the risk of cardiovascular disease. Because of the high lycopene levels in autumn olive fruit, and the potential health benefits of this phytonutrient, there has been increased interest in commercial fruit production.

There are varieties available commercially that were selected for fruit quality and are sold for edible landscaping (Hidden Springs Nursery, Cookeville, TN). The USDA-ARS Fruit Laboratory has also accumulated a collection of clones that may have superior properties for commercial fruit production. In a low-input planting at Beltsville, Maryland, commercial varieties and USDA selections have produced a substantial crop of fruit

in the third year. Management inputs included irrigation during initial establishment, mowing row middles, and some pruning to facilitate harvest. Except for spot-applications of herbicide for weed control, no pesticides or fertilizers have been used in the planting. Except for some mid-summer Japanese beetle feeding, and 17-year cicada damage, there has not been any notable disease or insect problems. Among the better varieties and selections, annual yields in the 3rd to the 5th year have ranged from 9 to 35 pounds per plant (machine-harvested). With spacing of 360 plants per acre (12' between rows by 10' within row), this equates to 3,600 to 12,600 pounds per acre. These yields are despite damage from a tornado, a tropical storm and a seventeen-year cicada hatch.



We have successfully machine-harvested these plants for the past three years. A commercial blueberry-harvester (Korvan model 930) efficiently defruited properly pruned plants when set to a vigorous shake. Some pruning was required for shrubs to pass through the harvester. The fruit can also be efficiently harvested on a small scale using a bat or club to beat the branches, and catch frames or tarps to collect the falling fruit.



Unripe fruit is very astringent due to high tannin content. The deep red color often develops before the fruit is fully ripe. During ripening, tannins and acids decrease and the sugar content increases. The best method for determining fruit ripeness is taste testing, or watching for bird feeding in the upper branches. Ripe fruit can be processed into a number of products including salsa, steak sauce, meat glaze, pie filling, ice cream topping, jams and preserves. Each fruit contains a single seed or pit that constitutes about 10% of the total weight of the fruit. For best results, the seed should be removed from the pulp during processing. We have had success separating the seeds by cooking the fruit and pressing the pulp through a screen designed for home processing of grape. Lycopene is soluble in oil, but not water or alcohol and therefore stays in the pulp and does not come out in juice or wine.

Marketing of fruit products will require some consumer education as the fruit is not a part of the traditional diet of most ethnic groups in the U.S., although it is consumed somewhat in China, Japan and Korea, where it is valued for its perceived health benefits. Further, none of the currently used common names connote a fruity flavor. The name 'Autumnberry' has been suggested as a more palatable alternative.

Plants do not spread by root suckering, but can be quite persistent once established, growing back from the roots when cut down or mowed off. Due to this persistent nature, seed dispersal by wildlife, and the ability to thrive in poor soils, some states have now listed autumn olive as an 'alien invasive' species. Therefore, we do not recommend planting autumn olive on your farm if it isn't already established in your area. However, if it is established in your area, you might consider autumn olive as a source for organically produced ingredients of healthy, flavorful products, and therefore a potential source of cash.

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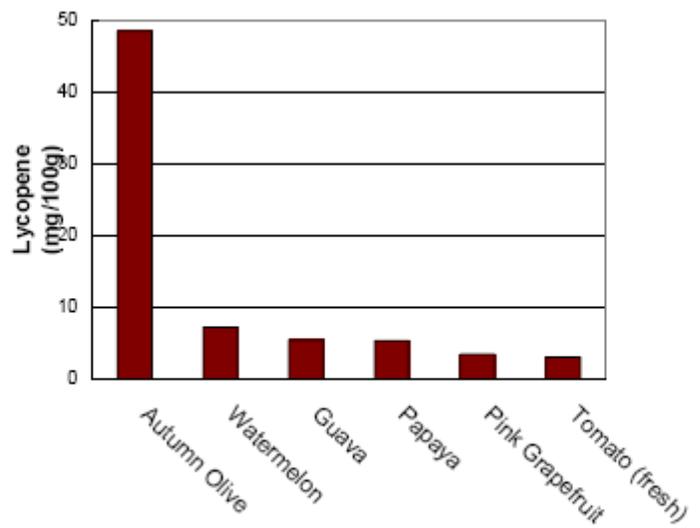


Figure 2. Sources of dietary lycopene.

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