



Leaf Amaranth

Matt Ernst¹

Introduction

Amaranth is a versatile warm-season, broadleaf plant that can be grown as a leafy vegetable, ornamental, grain or forage crop. Until recently, amaranth in the U.S. was grown almost exclusively for its grain, which is produced on large, brightly colored seed heads. Most grain amaranth grown in the U.S. is *Amaranthus hypochondriacus*; however, *A. cruentus* is grown to a lesser extent. Leaf amaranth (*Amaranthus tricolor*) is a popular vegetable in ethnic cuisines of Asia, Africa and the Caribbean. Cultivation of leaf amaranth has increased in the U.S. to supply ethnic markets, as well as consumers open to new or novel leafy greens and salad mixes. This profile focuses on leaf amaranth; information on grain amaranth is available from the Center for Crop Diversification [here](#).

Marketing

Consumer interest in leaf amaranth has increased with demand for new or novel salad greens, especially as consumers are more open to greens that can be produced earlier or later than traditional varieties. Market outlets for locally grown foods, like community farmers markets and community supported agriculture (CSA), are likely to be more open for vegetable amaranth. Restaurants and local grocers, especially those specializing in ethnic items, may also be more likely to look at new types of leafy greens and other salad vegetables.

Market Outlook

Broader food marketing trends favor more diversity in salad greens, and leaf amaranth positions well within those trends. Leaf amaranth also fits into strong consumer interest in ethnic cuisines, which continue to grow beyond



Amaranthus tricolor 'Elena's Rojo'

traditional consumers.

Production Considerations

Cultivar selection

Many leaf amaranth cultivars are available, including red leaf varieties for baby amaranth and salad mixes. 'Garnet' is a red leaf variety available from numerous seed sources. Green leaf varieties are typically cooked in ethnic cuisines, and green leaf amaranth cultivars tend to be bitterer in taste than red leaf amaranth. Some selections may also have a mix of green and red leaves, with varying eating qualities. Select cultivars based on suitability for growing zone; experiences of other producers may also be a good source of information on lesser-known cultivars.

Site selection and planting

Amaranth prefers fertile, well-drained soils and will not tolerate poorly drained soils. Ideal soils include well-drained,



¹Matt Ernst is an independent contractor with the Center for Crop Diversification.

slightly acid sandy loams. Since it is initially a poor competitor with weeds due to its slow growth, amaranth should not be planted in fields with difficult-to-manage noxious weeds. Amaranth is characterized by a sparse root system and intolerance to frost. Amaranth is related to pigweeds, waterhemp, and Palmer amaranth, so herbicides that control those weeds may injure amaranth. Amaranth produced on a larger scale, for seed, works well in a rotation with corn and soybeans.



Amaranthus tricolor 'Aurelia's Verde'

Due to the small seed size, amaranth can be difficult to establish in a uniform stand. Plant into a tilled, fine, firm seed bed where there will be good seed-to-soil contact. Adequate moisture is essential for rapid germination, emergence, and early growth of the small, fragile seedlings. Crusting soil can result in reduced emergence. Once established, amaranth is drought-tolerant. Follow seed company recommendations for seeding and spacing. Leaf amaranth variety trials conducted in 2016 at Washington State University seeded three grams of leaf amaranth seed per 10 feet, evenly spread into six seeding holes.

Pest management

Few diseases are known to cause serious crop losses in amaranth production. The most commonly reported diseases include damping-off and seedling blights due to *Pythium*, *Aphanomyces* and *Rhizoctonia*. White rust due to *Cercospora* and stem cankers due to *Rhizoctonia* and *Phoma* have also been reported. Diseases are managed through proper site selection and by following good cultural practices; there are no fungicides labeled for use on amaranth.

Leaf amaranth is susceptible to foliage damage from chewing insects like striped amaranth beetle, tarnished plant bug (*Lygus*), flea beetle, and amaranth weevil. When produced for grain (seeds), amaranth can tolerate considerable insect leaf feeding without affecting yields; however, blister beetles and alfalfa webworm have been known to cause economic losses in Missouri. Although there are no synthetic insecticides labeled for this crop, various organic compounds

can be used.

Weed management can be a challenge since there are no herbicides registered for amaranth. The first step in effective weed control is to avoid planting into fields with heavy weed populations, particularly pigweed and lambsquarters. Along with site selection, site preparation should be aimed at making sure existing weeds are under control prior to planting. Adjusting the planting date may aid in weed management. Once amaranth reaches a height of 10

to 12 inches, plants will be able to out-compete later emerging weeds. Cultivation and hand weeding are the primary methods for reducing weed problems during the growing season.

The lack of synthetic pesticides registered for amaranth coupled with the low disease and insect pressure could make amaranth a good candidate for organic production.

Harvest and storage

Amaranth for greens is traditionally harvested when it reaches a height of 6 inches or more. Early varieties can be harvested as soon as one month after planting. Harvest methods vary: Plants may be cut about 3 inches above the ground to allow regrowth; or, the entire plant may be pulled with roots. Cooling the leaves (45 to 55 degrees according to University of Maryland guidelines) before market delivery will improve quality.

Labor requirements

Labor needs are approximately four hours per acre. This may vary considerably according to the scale of production and handling time incurred by the producer.

Economic Considerations

Initial investments will depend on the production system used: bare ground, plasticulture or protected culture, like high tunnels. Startup costs could then include tillage equipment, bed shapers, plastic layers and installation of an irrigation system. Bed prepara-

tion and purchase of seed and fertilizer are the major preharvest expenses.

Because of the significant variations between possible market prices and production systems, a producer should estimate potential production costs based on the individual situation. Production budget templates for lettuce can be modified for leaf amaranth production.

Selected Resources

- Amaranth (University of Kentucky) <https://afs.ca.uky.edu/poultry/using-amaranth-poultry-diets>
- Leaf Amaranth Variety Trial (Washington State University, 2016) <http://agsyst.wsu.edu/LeafAmaranth.html>
- Amaranth (Page 10 in Ethnic and Specialty Vegetables, University of Maryland, 2008) https://extension.umd.edu/sites/extension.umd.edu/files/_docs/EthnicVegHandbook2008.pdf

- “Variety Trials and Production Methods for Vegetable Amaranth in the Northeast” (University of Rhode Island, 2017) <https://digitalcommons.uri.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=2073&context=theses>
- Amaranth (New Entry Sustainable Farming Project, Tufts University) <https://nesfp.nutrition.tufts.edu/world-peas-food-hub/world-peas-csa/produce-recipes/amaranth>

Suggested Citation:

Ernst, M. (2020). *Leaf Amaranth*. CCD-CP-139. Lexington, KY: Center for Crop Diversification, University of Kentucky College of Agriculture, Food and Environment. Available: <http://www.uky.edu/ccd/sites/www.uky.edu/ccd/files/leafamaranth.pdf>

Reviewed by Tim Phillips, Associate Professor, UK Plant and Soil Sciences, and Josh Knight, UK Senior Extension Associate

Photos courtesy of Carol Miles, Washington State University

November 2020

For additional information, contact your local [County Extension](#) agent

Educational programs of Kentucky Cooperative Extension serve all people regardless of economic or social status and will not discriminate on the basis of race, color, ethnic origin, national origin, creed, religion, political belief, sex, sexual orientation, gender identity, gender expression, pregnancy, marital status, genetic information, age, veteran status, or physical or mental disability.