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*Dr. Abigail A. Maynard and Dr. David E. Hill
Department of Forestry and Horticulture
The Connecticut Agricultural Experiment Station
123 Huntington Street, P. O. Box 1106
New Haven, CT 06504-1106*

Phone: (203) 974-8516

Fax: (203) 974-8502

Email: Abigail.Maynard@ct.gov

Website: www.ct.gov/caes

How to Grow a Vegetable Amaranth in Connecticut

Amaranth (*Amaranthus* spp.) has been cultivated for vegetable (leaves) and grain for more than 2,000 years. Native to the Americas, over 400 varieties are now found throughout the world in both temperate and tropical climates. It is consumed as a vegetable in Africa, China, Greece, India, Italy, Nepal, the Caribbean, and the South Pacific Islands. In Asia and the West Indies, amaranth is widely used in soup. In Jamaica, it is routinely eaten at breakfast and dinner. Both the leaves and the seeds contain protein of an unusually high quality. The grain is milled for flour or popped like popcorn. The leaves of both grain and vegetable varieties may be eaten raw or cooked; however, the amaranths that are grown principally for vegetable use have larger and tastier leaves than those of the grain varieties. Amaranth leaves are comparable to spinach (*Spinacia oleracea* L.) in taste. However, unlike spinach, the ideal season for producing amaranth in the temperate climates is the hot, humid, and sunny conditions of summer. It is a good source of dietary fiber, and contains high amounts of protein, vitamins, and minerals and three times as much iron as spinach. Vegetable amaranth is also known as “calaloo” which is a Caribbean term for “leafy vegetable”.

Varieties. Cultivars vary in size and color. The various leaf colors include white (light green), dark green, red, purple, and variegated (looking similar to the house plant coleus). Most reach a height of 3 feet, but some dwarf varieties grow only 1.5 feet high and are best suited for the small garden. There are subtle variations in flavor amongst varieties, so it pays to try a few different cultivars to see which you prefer.

Planting. Amaranth is planted either by direct seeding or transplanting. The choice of planting method depends on the availability of seed and labor.

Direct seeding is appropriate when sufficient seed is available, but the risk of a poor stand increases because of uneven germination and competition with weeds in the early stages of growth. Transplanting ensures an even stand and is preferred when seed is limited and labor is not restricted.

Growing transplants. Containers for growing transplants can be purchased. Alternatively, you can use plastic egg cartons, milk cartons, aluminum foil loaf pans, or pie tins. Provide drainage holes at the bottom of the container before filling the container nearly to the top with a soilless mix. Garden soils may be contaminated with disease organisms and weed seeds, and drainage is often poor.

Sow seeds approximately 5 weeks before planting in the field. For our trials, seeds were started in the first week of May. When using trays or pans, plant seeds thinly in rows and cover with one quarter of an inch of soilless mix. When planting in individual containers, plant two or three seeds per container. After thorough watering, cover the containers with a piece of plastic or slip them into a clear plastic bag to maintain high humidity until germination. Maintain the optimum germination temperature of 80°F. Germination time is usually 7-14 days.

As soon as the seeds germinate, remove the plastic cover to provide maximum light intensity. Maintain at least 6 hours of direct sunlight each day. Alternatively, cool, white, 40-watt fluorescent tubes placed 6 to 8 inches above the seedlings can be used as a supplemental light source. Optimum growth can be obtained if the fluorescent fixture is next to a window to increase the amount of natural light reaching the young plants. The planting medium should be kept moist, but avoid overwatering. In trays

with multiple cells, each cell should be thinned to one plant per cell. Seedlings germinated in larger trays should be transplanted to individual containers before the true leaves begin to form.

Fertilization. Soluble 20-20-20 fertilizer (1 tbsp/gal) is added to the potted seedlings about ten days before transplanting. Although amaranth is a low management crop and can grow in poor soils, yield is increased with a fertilizer application. A soil test is highly recommended to determine the available N, P, and K. In general, a loamy field soil fertilized with 10-10-10 at a rate of 1300 lb/A before transplanting produces optimum yields. Sandy soils may require a mid-season (after the first cutting) sidedressing of nitrogen, generally applied as calcium nitrate or ammonium nitrate. The pH of the field soil should be about 6.5. If the pH is too low, lime can be added at a rate determined by a soil test.

Field transplanting. At least one week before transplanting in the field, transfer seedlings to an outdoor cold frame for hardening. In late-May to early June, transplant seedlings one and one-half feet apart in rows three feet apart. At closer row spacing, branches of plants in adjacent rows become intermixed and make harvest more difficult.

For direct seeding, spacing should be the same as transplanting to facilitate cultivation. For greatest yields, amaranth should be direct seeded in June when soil temperatures reach 65°F. Seeds should be planted about one quarter of an inch deep (or covered with one quarter of an inch of soil) for good germination. Because the seeds are small, a thin layer of fine mulch, such as grass clippings or straw, can prevent drying and erosion of the soil surface until plants are established. Thinnings can be eaten.

Irrigating. Although amaranth is relatively drought tolerant, insufficient water will reduce yield by promoting flowering. Water should be applied just after sowing or transplanting to ensure a good stand. As a rule, the plants should be irrigated if wilting occurs at noontime. Soil moisture content can be determined by taking a handful of soil from the bottom of a 6-inch-deep hole. If it holds together when squeezed, there is sufficient soil moisture; if the soil crumbles, it's time to irrigate with about one inch of water. Over-watering may enhance development of disease and promote nutrient leaching. Overhead sprinkler irrigation in the morning is preferred over late afternoon or evening.

Harvest. Vegetable amaranth is ready to harvest about a month after transplanting, or about 45 days after direct seeding. Plants may be harvested once or several times. With single harvests, whole plants are pulled from the soil with roots, washed, and tied in bundles. With multiple harvests, young leaves and tender shoots are picked at 2-3 week intervals or the whole plant is severed at about 8 inches from the soil surface. Eventually, the plants begin to flower and develop fewer leaves. Frequent harvesting of leaves and shoots delays the onset of flowering, and prolongs the harvest period. In Connecticut, as many as four cuttings are possible. Ten mature plants can supply a family of four.

Use. Vegetable amaranth leaves and stems or entire plants may be eaten raw or cooked. It is commonly cultivated for use as a boiled leafy green vegetable either alone or in combination with other vegetables and/or meat. Cook amaranth as you would spinach. The presence of rather high amounts of oxalic acid and nitrates places some limitation on the quantity of raw amaranth leaves that can be consumed daily. Boiling the leaves like spinach, then discarding the water reduces the levels of both oxalic acid and nitrates. The amount of oxalic acid is roughly the same as that found in spinach and chard.

Summary. The demand for vegetable amaranth in the United States was initially created by immigrants from the countries where it is widely consumed. Now it is realized that vegetable amaranth can also fill a void for fresh leafy vegetables during the summer months. Most leafy greens grown in the United States prefer cool weather and perform poorly during hot summer months, while vegetable amaranth thrives in the heat of summer. For the commercial grower and backyard gardener alike, amaranth is easy to grow and provides a healthy vegetable in the hot summer months. In addition, the red-leafed and variegated forms are quite decorative, adding a splash of color to your garden or farm stand.