

Asparagus

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Asparagus (*Asparagus officinalis* L.) is a member of the lily family and is related to onions, leeks, and garlic. It is a perennial vegetable that may serve as an ornamental as well as a food crop. The mature asparagus plant has a clumping growth habit with lacy, fern-like foliage about 3 feet high. Although it is considered a temperate crop, it has proven to be well adapted to year-round growing conditions. It grows best at daytime temperatures of 75–85°F and night temperatures of 60–70°F.

Asparagus is a good source of dietary vitamin C and folate. A serving (1 cup) of cooked asparagus contains about one-third of the U.S. RDA of vitamin C and two-thirds of the RDA of folate. It also contains vitamin A, potassium, phosphorus, and iron at 7–10 percent of the RDA. Asparagus is suitable for use in low-sodium diets, and it contains only 43 calories per 1-cup serving.

Asparagus varieties

The older asparagus cultivars, such as ‘Mary Washington’, are being replaced in popularity in the USA by higher yielding, all-male cultivars such as ‘Centennial’, ‘Jersey Giant’, and ‘Jersey King’. These are preferred because they do not produce flowers, fruits, or seeds. Some of the all-male California cultivars such as ‘Apollo’, ‘Atlas’, and ‘UC157’ have given good yields when grown in Hawaii and are probably more suited to Hawaii’s climatic conditions.

Propagation methods

New asparagus plants can be started from vigorously growing clumps of roots, called crowns, that are about 1 year old. However, the availability of crowns in Hawaii is usually very limited. Most new asparagus varieties are available as seed in



Asparagus crown

local garden shops. Therefore, the preferred method of propagation in Hawaii is from seed.

Seedling quality is extremely important in determining the future success of the asparagus plant. Special care should be taken in raising the seedlings before transplanting. Sow seeds in 4-inch peat pots using a rich, loamy soil mix. Water on a regular basis with periodic feeding of a nutrient solution such as Miracle Grow™. Discard weak seedlings, using only the healthiest ones for transplanting. Seedlings started in 4-inch peat pots should be ready for transplanting within 3 months from sowing.

Preparation of site and planting

Asparagus prefers sunny conditions and a loose, well-drained soil. It will tolerate heavier clay soils as long as the soil has good internal drainage and the water table does not come within four feet of the surface, which would interfere with the plant’s extensive and deep root system. The ideal pH range for asparagus is between 6.7 and 7.5. It does not tolerate acid soils and will not grow well at pH of less than 6.0. A soil pH maintained at 7.0 or above will also reduce the effects of fusarium crown and root rot, a fungal disease that contributes to asparagus decline.

Asparagus does not require a lot of water once it has become established, and it tolerates brackish water and moderately saline conditions.

The garden site may be in a vegetable plot or along a fence or wall, where the fern-like foliage will form an attractive backdrop or low screen. Once the site is chosen, time spent preparing the soil before planting will be rewarded. The asparagus plant lives for up to 15–20 years or more and will be much more productive during that time if steps are taken to ensure a weed-free and fertile soil condition. Proper preparation of the planting bed is essential to root health, which directly affects the vigor and yield of the crop.

Asparagus does not compete well with weeds. All weeds such as thistle, crabgrass, goosegrass, and others should be killed by spraying with a herbicide such as glyphosate (Roundup®). After the weeds have died back, dig a trench approximately 18 inches wide and 18 inches deep. The number of plants will determine the length of the trench. Allow 1 foot for each new plant within the trench and leave at least 4 feet between trenches.

Amend the soil that you removed with lime (if necessary), a generous amount of compost, and 2 pounds of a complete fertilizer such as 15-15-15 for every 25 linear feet of trench, and mix these thoroughly into the soil. Make sure that the compost is mature and does not contain any material that is not thoroughly decomposed (the original materials should not be recognizable). Immature compost will cause soil nitrogen to be unavailable to the plants. Add lime as determined by a soil analysis to raise the soil pH to 7.0–7.5. This soil mixture should be piled along the length of the trench. It will be used later to fill in the trench as the plants grow.

Sprinkle 2 pounds of triple superphosphate (0-46-0) fertilizer per 25 linear feet into the bottom of the trench, cover it with a 6-inch layer of the amended soil, then water well. This pre-plant application of triple superphosphate below the new planting will not burn the plants. It is an important factor in long-term asparagus production and is more effective than annual applications to the soil surface. If phosphorus is not added before planting, it is difficult to get it down into the root zone later because it does not readily move through the soil.

Place the crowns or seedlings in the trench, leaving 12–16 inches between plants. The spacing will determine the average diameter of the future spears at harvest. Wider spacing produces thicker spears ($\frac{1}{2}$ – $\frac{3}{4}$ inch), and closer spacing produces thinner spears ($\frac{3}{8}$ – $\frac{5}{8}$ inch). Cover crowns with about 2 inches of the amended soil that was prepared after trenching. Seedlings are placed in the trench in the peat pots and covered with soil to the top of the pot. Do not cover any foliage of the seedlings. At this point the roots of the newly planted material should be about eight inches below the top of the trench. As the spears grow up through the soil, gradually fill in the trench with the amended soil, being careful to avoid completely covering any shoot tips or foliage. The trench should be filled to ground level in 4–5 weeks. Continue to water

regularly while the stalks grow. As growth progresses, the stalks will begin to produce feathery, fern-like branches and leaves that may reach waist high. Add a layer of compost along the top of the trench under the ferns as they continue to develop.

In Hawaii, harvesting of young shoots should not take place until after a full year of growth. Care should be taken not to overharvest in the first year. It is important to establish vigorous fern development in the first season. Subsequent years will produce heavier yields.

In cold-weather climates, the foliage yellows and dies back in the fall or early winter. The ferns are cut back and the bed is covered with several inches of dead foliage and mulch. In the spring, all of the young shoots are harvested for several months before allowing subsequent shoots to mature and leaf out. This results in one harvest period per year. In Hawaii, the asparagus plants do not undergo winter dormancy and can be harvested several times a year.

Watering

The newly planted asparagus should receive abundant water during the first growing season. Weekly irrigation sufficient to wet the soil to a depth of 8–10 inches should be adequate. After the first growing season, asparagus plants develop a deep, extensive root system and do not require frequent irrigation. Slow watering that supplies 2–3 inches every other week during dry weather should be sufficient. The objective during the first year of growth after planting is to develop maximum fern growth in order to build an extensive storage root system. Any practice that does not fulfill this objective can have a detrimental effect on yield and may shorten the life of the asparagus planting.

Fertilizers and cultivation

The most important soil amendments and fertilizer applications are the initial ones during trench preparation, before planting. Broadcasting and shallow cultivation of a 15-15-15 or similar complete fertilizer at 2 pounds per 25 linear feet every three months during the first year will ensure vigorous fern and root development. Just before the first harvest and all subsequent harvests, apply 10-30-10 at a rate of 1 pound per 25 linear feet. Application of 15-15-15 at a rate of 2 pounds per 25 linear feet twice a year during fern growth is adequate to maintain healthy growth and a good yield. Research

has shown that neither the amount nor timing of nitrogen applications to asparagus after establishment has any impact on yield, in spite of the lush green color and tremendous vigor of the foliage that results from these applications. An occasional soil analysis will determine whether the pH needs to be adjusted with a surface application of lime, but the most effective lime application will be the one thoroughly mixed into the soil before planting.

Deep cultivation as a means of soil amendment or weed control is not recommended after the first year because of its potential to damage the root system. Application of a preemergence herbicide prior to each harvest and occasional spot treatments with a postemergence herbicide such as Treflan® when needed will help to control weeds. Check your local garden shop for herbicides labeled for asparagus. Composting around the base of the plants down the entire row will help to control weeds and has been found to increase yield.

Harvesting

In Hawaii, asparagus can be harvested more often and over a longer period than in cold-weather climates. Two methods of harvesting are recommended, and the choice should be determined by your specific needs.

With the *clear cut method*, irrigation is stopped for a month to induce dormancy. During this time the ferns yellow and begin to die back. This should be done in the dryer summer months if your location is likely to have significant rainfall during the winter. At the end of the month, all of the ferns are cut down to ground level, 10-30-10 fertilizer is applied, and a layer of compost is



mounded over the freshly cut surface to a depth of about 3–4 inches. Water application is then restored to a level that will maintain growth (irrigation may not be necessary if rainfall is adequate). This treatment will induce the emergence of new shoots, which are harvested by cutting the spears at the base of the root ball just below ground level. It may be necessary to clear some of the compost away from the base of the plant during the first few days of harvest. The spears grow rapidly and can reach lengths of 8–9 inches in one day when day temperatures are 80–85°F. Under these conditions, spears should be harvested daily, before the heads open and they become inedible. Harvest all spears that emerge for a period of 5–6 weeks, and then allow all subsequent shoots to develop new foliage and grow for the next 5–6 months, after which time the process is repeated. This routine will give two harvests per year, each lasting 5–6 weeks. If you have enough plants, the timing can be staggered so that some of the asparagus is being harvested all year.

The other harvest method is the *mother plant system*, which also is preceded by a drying-out period. One month after withholding water, all of the ferns are removed as in the first method. Fertilizer and a layer of compost is added to the top of the trench and water is restored. The first three spears that emerge are allowed to grow and develop into ferns that will provide photosynthetic support to the plants during a continuous harvest period. Water is provided as needed. All of the other newly emerged spears are harvested for up to 6–8 months or until the shoots become small and spindly. At that time, the shoots are allowed to grow, and 15-15-15 fertilizer is applied to produce lush, vigorous growth of the foliage. In 4–5 months the cycle can be repeated. The timing for this method can also be staggered if enough plants are being grown. In Hawaii, a dozen high-yielding, all-male asparagus plants that are timed for a staggered continuous harvest will provide the average family with a year-round supply of fresh asparagus.

Freshly harvested asparagus is highly perishable and loses quality rapidly at temperatures above 40°F. Collect the harvested spears as soon as possible, protect them from the sun, immerse them in ice-cold water for ten minutes, and store them at a temperature of 33–36°F. Asparagus spears can be stored for up to three weeks at these temperatures if the relative humidity is maintained at 90–95 percent.

Diseases and insects

There are no serious problems with insect pests or diseases of asparagus in Hawaii. The foliage may become infected with rust during wet periods. Rust can be controlled by burning the ferns as they are cut back. Fusarium crown rot may also become a problem from time to time. Keeping the soil pH above 7.0 with applications of lime usually is enough to control this disease.

Aphids, cutworms, and thrips can cause occasional damage, but they are easily controlled by insecticides, including sevin, that have labels allowing use against those pests in asparagus. Nematodes do not seem to be a problem for asparagus in Hawaii.

Asparagus decline syndrome is caused by many factors. Any stress factor that inhibits or reduces plant vigor allows infection or insects to become established and

eventually overcome the plant. Therefore it is essential to supply the proper soil pH and fertility, use tolerant varieties, avoid excessive harvesting, and control insects, diseases, and weeds.

Sources: Hawaii Agriculture Research Center (HARC), unpublished data; Ohio State University Bulletin 826, *Asparagus production, management and marketing*; Mercury Center Gardening Calendar, "Asparagus"; University of Minnesota Extension Service, *Growing asparagus*; Shasta Nursery, Inc., "Growing instructions for asparagus"; 26th Annual National Asparagus Festival, "Asparagus facts and information." Photos provided by H. Valenzuela (p. 1) and R. Paull (p. 3), CTAHR Department of Horticulture.

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