

Department of Plant Sciences

GARLIC FOR THE TENNESSEE VEGETABLE GARDEN

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Crop Description

Garlic (*Allium sativum*) is a monocot in the same family as onions and leeks. Garlic, though, produces several small bulbs, called cloves, instead of a single large one. These cloves are also generally the propagule planted by the gardener rather than a seed, which means that propagation is vegetative and the plants actually are clones (genetically identical).

Garlic is typically grown as a fall to spring crop rather than during the main growing season. It is generally grown in mild climates, but it can be produced in colder climates when cultivars are selected well and protected. Garlic performs well in the moderate winters we have in Tennessee, but selection of types and cultivars is important.

Garlic originated in Asia and has been cultivated for thousands of years. Its long history and lore are intertwined with culture and religion, having supported everything from ancient Greek athletic prowess to vampire deterrence. In more modern times, a range of compounds in garlic have been found to have antimicrobial properties and other human health benefits.



Figure 1. A hardneck garlic 'Purple Glazer' soon after early summer harvest. Image: Lucas Holman

Planting and Growing

Two main types of garlic exist and are considered subspecies. The softneck subspecies (*A. sativum* subsp. *sativum*) is the most commonly grown commercially, but those growing regions are typically in much different climates (California). The term softneck refers to the lack of a seedstalk. This subspecies often has a greater number of smaller cloves at harvest, and is often grown commercially thanks to long storage potential. Softneck types can often be less winter hardy, so select a cultivar known to perform well in your area or grow hardneck garlic.

Hardneck garlic (*A. sativum* subsp. *ophioscorodon*) produces a seedstalk in the center of the cloves called a scape. The upper scape is typically removed but the lower portion remains present as the cloves are harvested and dried — thus the term hardneck. The scape has many uses, including enhancing recipes with its mild garlic flavor. Hardneck garlic is generally more winter hardy and often produces a smaller number of larger cloves.

Elephant garlic is actually a type of leek (*A. ampeloprasum*) that produces cloves larger than garlic. These cloves are often milder in flavor. Elephant garlic can be easier to grow for some gardeners, but it does not store as well as true garlic.

Types	Cultivars and Notes
Hardneck	Chesnok Red — Purple stripe clove Duganksi — Purple stripe clove German Red German Extra Hardy Music — White clove Purple Glazer — Purple stripe clove
Softneck	Inchelium Red California White
Elephant	Also called Tahiti — May not see many specific cultivars

Since Tennessee is transitional in climate, many gardeners have the option of growing hardneck or softneck as well as elephant. It may be best to try one or two cultivars of each initially to determine winter hardiness, production, clove size and personal preference. Order from reputable seed sources or purchase cloves from local growers who are knowledgeable about performance in your area.

Regardless of whether you select hardneck or softneck, plant garlic in the late fall (September through early November) and harvest in early summer. Chilling during the winter as well as long photoperiods (daylength) during the late spring/early summer are both needed for good development of the bulb or cloves (Figure 2). Essentially, roots and leaves produced in the late fall and early spring support good bulb growth in the late spring and early summer. Most varieties require 180-220 days to mature.



Figure 2. Late spring image of expanding garlic bulb showing cloves and seed stalk in the center of the cloves. Image: Lucas Holman

Choose a loose, friable soil that has good organic matter content and a pH between 5.8 and 6.5. If drainage is moderate to poor, use a raised bed for good drainage during the often wet Tennessee winters. Garlic is a space efficient crop that can be managed well in raised beds. It is also in a different crop family than many of the general vegetables grown in the garden. So, garlic is a good candidate for crop rotation with tomatoes, peppers, beans and many leafy crops grown in raised beds.

In East Tennessee, gardeners often plant garlic between Sept. 1 and Nov. 1. These dates are a bit later (Sept. 15-Nov. 15) in West Tennessee. When planting, arrange garlic in traditional garden

rows, or save space and plant it in 4-by-4-inch grids. Plant cloves 1-1½ inches deep in the soil. Select larger cloves for planting as clove size relates directly to bulb size at harvest. Plant the cloves by hand and make sure they are upright for straight growth.

Onion and garlic fertilizer requirements are similar. They generally require a complete fertilizer at planting, often followed by early (when plants are 6 inches tall) spring additions of nitrogen fertilizer. Monitor moisture in the fall soon after planting, as it is often the driest time of year in Tennessee. Also, ensure adequate moisture in the spring as bulbs are being produced.

Weeds are one of the greatest challenges in growing garlic. Manage them closely to prevent competition with the crop. Plastic as well as straw and other organic mulches can prevent winter annual weed seeds from germinating. Because much of the garlic production season is during the fall, winter and early spring, pest pressure can be lower. Summer insect feeding can be an issue, though, so maintain close scouting during the spring and early summer.

Another management task common for garlic growers is the removal of the scape from hardneck garlic plants. The image on the right shows the scape with an unopened flower. The goal of scape removal is to reduce energy needed to grow and mature the flower.



Figure 3. Scape (unopened flower) of hardneck garlic in late spring ready to be removed. Image: Natalie Bumgarner

Harvesting and Storage

Determining the optimum harvest time is one of the most important tasks for garlic gardeners. Pull some bulbs in mid-May to mid-June and look for segmented cloves with a tight outer skin. As a rule of thumb, it is best to have four to six green leaves on the garlic for it to be nearing ready to harvest. These wrapper leaves (which are shells around garlic) help improve storability. On softnecks, the tops will begin to fall over and all of the leaves will start yellowing. It is important not to let the garlic over mature. Cloves can separate in the bulb, which leads to breaking of the outer sheaths over the cloves and greater risk of clove damage and decay.

Running a sharp knife or cutter bar under the bulbs to cut the roots can assist with harvest. It's probably easiest to use a small shovel to raise the bulb out of the ground if your soil is loose enough. This method will help ensure that you are not breaking the bulb when directly pulling it out of the ground. Generally, garlic is raised from the field and gently brushed by hand to get off the larger clumps of soil. It is then air cured in an area that is out of the sun and the weather for about six weeks. Curing is needed to help the garlic last longer in storage. Good airflow is imperative in this process and is a requirement for the garlic to cure naturally. It can be hung on a porch or an outbuilding that is not closed off completely, but it must be out of the sun.

Once cured, garlic can be stored from 60-90 F with good ventilation and a low humidity. If you are interested in braiding the garlic, it needs to dry for a few days beforehand. Softnecks are the only garlic that can be braided, as the stems of the hardnecks are too stiff stem.

Common Pests, Diseases and Issues in Garlic Crops

Description of Issue	Possible cause(s)	Prevention/Control Steps
Whitish areas, silver lines or scarring on the leaf.	Thrips — Onion thrips	Insecticides can be used, but typically only when populations are high.
White mold growing around the bulb. Yellowing and stunted growth during the growing season.	Bulb rot — White Rot	The key to prevention is to not plant the same garlic in the same location repeatedly. Buy garlic seed from a reputable source. Little can be done once this fungus is in the soil. Send bulbs to the diagnostic lab for a definitive diagnosis to ensure that the best management steps are taken.
Tiny holes in the bulb after harvest. Eventually the bulb will rot a couple of weeks after harvest.	Wireworms — Immature beetle larvae	Turn the soil a few times during the summer before planting to break the life cycle of this larval pest. Wireworms are often worst in locations recently converted from grass.



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