

# Department of Plant Sciences

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## ONIONS, LEEKS AND SHALLOTS FOR THE TENNESSEE VEGETABLE GARDEN

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### Crop Descriptions

The Allium genus has several vegetable crops grown by gardeners, including onions, chives and garlic, and lesser known leeks and shallots. In fact, onions (most often *Allium cepa*) are one of the longest known crops in cultivation. One of the key facets of onion production is their response to daylength for bulb formation. A range of daylength response can be found in onion cultivars, so gardeners need to understand onion growth and production to be able to select appropriate cultivars.



*Figure 1. Bulbing onions getting close to harvest size.  
Shutterstock image*

Shallots (*Allium cepa* var. *aggregatum*) are used for specific culinary purposes (usually as small bulbs) due to their mild flavor. They commonly have red scales (dried leaf bases) and will produce a small clump of bulbs from a single set. Leeks (*Allium porrum*) are a slightly developed, mild-flavored bulb grown and eaten along with a portion of the thick leaves that overlap to form the stem. Chives (*Allium schoenoprasum*), while also a member of the allium genus are a perennial herb grown for their leaves that will be covered in herb publications.

### Planting and Growing

Onions are a cool-season crop with best growth between 55 F and 75 F. They are often grown as an annual, but are actually a biennial crop, meaning that after a cool period, the plant will start reproductive growth with the right environmental cues. Onions are a monocot and have a true bulb with leaf bases (called scales) that are fleshy on the interior and dry or scaly on the exterior.

Onions are grown for two types of production: dry bulb onions and bunching or green onions. Planting and growing, as well as cultivars grown, can differ for these two uses. Dry bulb production focuses on taking the crop all the way to this fleshy large bulb stage (when leaves

have died down) while green onions are harvested for their leaves with little to no bulb formation. Bulbing in onions is heavily influenced by daylength, and onion cultivars fall in three main categories: short-day, intermediate-day and long-day. Long-day onions are typically harder, storage types, while intermediate and short-day onions are milder and are used fresh because they do not store as well.

Long-day onions require daylength of 14 hours or longer for good bulb formation, while intermediate day onions require 13-14 hours and short-day cultivars require 10-13 hours. These characteristics are very important for onion gardeners because bulbs may be produced too early or not at all if proper types are not selected. Tennessee is a transitional area. Short-day onions are typically grown south of 35 degrees latitude and could bulb too quickly in more northern areas. Long-day types may not produce bulbs well under shorter summer days in more southern locations. For most gardeners in Tennessee, intermediate-day onions would be a good choice for dry bulbs while intermediate or long day types could be used for growing green onions. Keep in mind, though, that Tennessee does not have much commercial onion production, so the performance of many cultivars has not been extensively trialed.

Onions can be grown from seed, but for dry bulb production, it is most common for them to be grown from transplants or sets (a small bulb that is dormant). Onions harvested green for leaves or small bulbs can be direct seeded, transplanted or grown from sets. Direct seeded onions can have more issues with weeds as they are poor competitors. Onions should be planted in the early spring as soon as the ground can be worked (late February to March in West Tennessee or March in East Tennessee). Some of these onions are also transplanted in the mid-fall (September to October) and protected through the winter for spring bulb production and then harvest. This method has not been trialed enough in Tennessee for reliable recommendations to be available for the gardener.

Crop	Cultivars* and notes
Onion	Evergreen white bunching — 60 to 70 days to harvest for green onions Ishikura — 60 to 65 days for long, slender green onion harvest Cabernet — 100 day long/intermediate daylength, red onion with good size and storage Candy — 110-day intermediate daylength, sweet bulb for fresh eating (not storage) Super Star — 100-day intermediate daylength, more pungent bulb Zoey — 100-day intermediate daylength, large, mild, some resistance to pink root disease
Leeks	Lancelot — Early season hybrid, reported to be slow to bolt
Shallots	Matador, Conserver — 90-100 days to harvest, traditional reddish-brown color with good storage potential May be found not labeled by cultivar

*\* Some cultivars listed here are as recommended in the Southeastern Vegetable Crops Production Guide and University of Kentucky Extension publication UD-36. Others have been grown in smaller scale Tennessee trials.*

Growing leeks and shallots is similar in many ways to growing onions, but they may have a longer production time and leeks tend to prefer cooler temperatures than onions. These characteristics mean they have the potential to be somewhat challenging crops for middle latitude growers. Both are commonly grown using transplants in the early spring for summer harvest or in the late summer for fall to winter harvest. Both are also grown in many southern climates as an overwintering crop as they are winter-hardy biennials. Overwinter production may be worth trialing for the home gardener and leeks, onions and shallots could be grown in a method similar to garlic (See UT Extension publication D 75).

For all of these allium crops, it is best to choose a loose, friable soil that has good organic matter content and a pH between 6.0 and 7.0. If drainage is moderate to poor, a raised bed would be a good choice. Most allium crops are relatively space efficient and can be managed well in raised beds. They can be planted in rows 12-16 inches apart with in-row spacing of 4 to 6 inches. Transplants and sets are typically placed 1 ½ to 2 ½ inches deep in the soil.

Fertilizer needs would be similar for these Allium crops, and they generally require a complete fertilizer at planting as well as a sidedressing (mostly N) 4 to 6 weeks after planting. Overwintering crops would typically be sidedressed the following spring as growth resumes. Moisture should be monitored closely as these are cool-season crops without deep or extensive root systems. However, drainage is essential for growth and bulb quality as well.

Weeds are one of the greatest challenges for Allium crops and should be managed closely to prevent competition with the crop. Plastic as well as straw and other organic mulches can prevent winter annual weed seeds from germinating. Woven landscape fabric can also be a porous option to allow rainfall but lower weed pressure. Small holes can be cut for the sets and only this area right around the developing plant will need to be weeded. This plastic mulch method could be used in traditional gardens or raised beds.



*Figure 2. Allium crop planted in black plastic mulch bed to control weeds. Bumgarner image*

## Harvesting and Storage

Harvest timing varies depending upon whether onions are being grown for green onions or dry bulbs. Green onions and leeks can be harvested at any time size is deemed sufficient for use as they are harvested for the green leaves and not bulbs. Dry bulb onions and shallots are typically harvested when the necks become more limber and often bend or break over. Periodically check for stem tenderness and bulb size to be prepared for harvest. Be careful not to leave these mature bulbs in the garden for too long as wet conditions can reduce quality. Bulbs can be undercut or lifted with a shovel. Pulling will often not be useful as the leaves have dried down.

Sometimes after undercutting, bulbs are left in the field for a few days. Then tops are cut to around 2 inches and roots are removed. Curing, which is the drying of the outer few scales, helps improve storage and reduce pathogen losses. Curing is best done in an area with air movement and low relative humidity.



Figure 3. Nymphs of onion thrips. Image credits: Whitney Cranshaw, Colorado State University, Bugwood.org

## Common Pests, Diseases and Issues in Garlic Crops

Description of Issue	Possible Cause(s)	Prevention/Control Steps
Whitish areas, silver lines or scarring on leaf	Onion thrips (See Figure 3)	Insecticides can be used, but typically only when populations are high.
Splitting or double bulbs	Not a disease or pest — physiological	Even watering, appropriate (not over) fertilization and consistent temperatures help reduce physiological issues.
White mold growing around the bulb. Yellowing and stunted growth.	Bulb rot — White Rot	The key to prevention is rotation and clean planting material. 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.
Dead or brown areas on bulb	Exposed bulbs can sunscald	Good nutrition and pest control help produce a healthy top. Also, make sure to harvest as soon as the crop is mature as bulbs can sunscald after leaves dry down.
Plant stunting or poor growth. Roots are pink or purplish but will later turn brown.	Pink root disease	Send bulbs to the diagnostic lab for a definitive diagnosis to ensure that the best management steps are taken.  This disease does have a long life in soil, so rotation will be needed if diagnosed.



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