Guide To Commercial Okra Production

Okra is a heat-loving plant whose history can be traced to the Nile basin in Egypt where Egyptians have cultivated it for centuries, according to accounts of the crop in the thirteenth century. Okra spread through North Africa from the Nile basin and on to the eastern Mediterranean, Asia Minor, and India, spreading to the New World from Brazil and Dutch Guiana. African slaves brought okra to North America by way of New Orleans. By 1781, the crop was familiar as far north as Philadelphia.

Today, the major centers for okra production are in the southeastern United States—Texas, Georgia, Florida, California, Tennessee, and Alabama—because of the sensitivity of okra to cold temperatures. In Alabama, production of okra is scattered throughout the state.

Planting Recommendations

General recommendations. Okra is a tender vegetable that cannot tolerate low temperatures for very long—and frosts are deadly. The optimum temperature range for growth is 70° to 86°F, with minimum temperatures of 64°F and a maximum of 95°F. Although okra is highly resistant to drought, it still requires considerable water for optimum growth and yield.

Soil. Okra grows best in well-drained sandy loam soils with high levels of organic matter (pH 5.8 to 6.5). It is difficult to achieve good stands when directly sowing seed in heavy clays. Be sure to choose a well-drained soil, since poorly drained soils may result in drowning of the plants.

Crop rotation. Okra is very susceptible to damage from nematodes. To prevent a build-up of nematode populations, follow a crop rotation using corn or grass crops. Okra should not follow other crops that are highly susceptible to nematodes such as squash and sweetpotatoes, which tend to increase nematode populations. To determine the nematode population in your field or garden, collect a soil or root sample and have it analyzed for nematodes by a reputable laboratory. Samples should be taken in late summer, prior to spring planting. Contact your county Extension agent for more information on how to sample for nematodes and for suggestions on control.

Time of planting. Do not plant okra into cold soils. Soil temperatures should be between 70° to 95°F for optimal germination. The earliest that okra should be planted in South Alabama is from April 1 to 15; in Central Alabama from April 15 to 30; in North Alabama from May 1 to 15.

Seeding rate and spacing. Prepare the land to ensure establishment of a uniform stand. Turn the soil in the fall or early spring so crop residues can decompose before the okra is planted. Early land preparation also allows time for weed seed to germinate, allowing for early cultivation to destroy young weeds.

Seed the okra to produce stands with plants spaced 12 to 15 inches apart within the row (spacings can be closer when using semi-dwarf varieties) and 2 to 3 feet between rows. Seeds should be planted to a depth of ½ to 1 inch. To achieve the maximum stand, plant three to four seeds per foot and thin to desired spacing. Seeding at this rate will require 6 to 10 pounds of seed per acre. Soaking seed in water overnight helps hasten germination. Transplants will enhance earliness. Transplant at the three- to four-leaf stage with a 12-inch in-row spacing.

Before planting, soil test each field to determine the correct fertility. Follow the recommendations from the analysis to prevent excessive plant vigor and poor yield. If no soil test is made, a general recommendation is to apply 30 pounds of nitrogen, 60 to 80 pounds of phosphorus (P₂O₅), and 60 to 80 pounds of potassium (K₂O) per acre. Sidedress with 25 pounds of nitrogen when plants are 6 to 8 inches tall and again 2 to 3 weeks later.

Maintaining a balance between foliage production and pod (or fruit) production is necessary for maximum yield. Avoid using extra nitrogen on vigorous plants until fruiting begins to check plant growth. Otherwise, plants will produce a lot of foliage with little flowering and subsequent fruit production.

Regardless of irrigation method, be sure to provide about 1 inch of water to the crop per week. Producing okra on dry (non-irrigated) land can be risky. Ensuring sufficient water to developing plants will produce good yields of high-quality pods.

Varieties

'Clemson Spineless' is a uniform spineless variety with medium dark green, angular pods requiring 55 to 58 days to reach maturity.

'Emerald' is a spineless variety with dark green, smooth, round pods, requiring 58 to 60 days to reach maturity. 'Emerald' is used primarily for processing.

'Lee' is a spineless, semi-dwarf variety with deep bright green, straight, angular pods, requiring 55 to 58 days to reach maturity.
These benefits promote increased yields. Drip irrigation systems must be used with plastic mulch.

On plastic mulch, transplant at the three- to four-leaf stage into staggered double rows spaced 15 to 18 inches apart between the double rows on 12-inch centers; place plants 12 inches apart. Be sure to place the drip tape in the center of the bed, 2 to 3 inches deep (see diagram).

Controlling Weeds, Insects, Diseases, And Other Pests

Weed control. Weed species infesting okra include annual grasses such as crabgrass and goosegrass; perennial grasses such as bermudagrass; broadleaf weeds such as sicklepod, annual morningglory, and common cocklebur; and nutsedge. When the okra and weeds are small, tilling with a rolling cultivator will kill most small weeds. Later, use sweep cultivators or rolling cultivators set to cover small weeds within the row. Avoid throwing too much soil directly against the okra stems, because doing so can increase incidence of stem rot.

Few herbicides are registered for weed control in okra fields. Using them improperly can damage your crop. Carefully follow the instructions printed on the label and apply herbicides at exactly the right rate and time. Contact your county Extension agent for up-to-date recommendations on herbicides for use on okra.

Inspect control. Chemical control of insect pests of okra can be a problem because few insecticides are registered for use on this crop. Frequent pest scouting and use of cultural controls are advised to find pest problems early and make the crop less susceptible to damage from insects. Insect pests of okra fall into two categories—foliage feeders and pod feeders.

Foliation feeders only cause economic damage (loss of yield) when pest numbers are high or when plants are young (or stressed). Foliage-feeding on well-established plants does not normally cause loss of yield because healthy plants can tolerate considerable loss of foliage before yield loss occurs. Tolerance of foliar damage increases with age of the plant and favorable growing conditions (that is, plentiful soil moisture, proper fertility).

Young plants are more susceptible to foliar feeding damage, so these plants should be scouted frequently to check for insects and feeding. Control may be necessary if moderate feeding damage is observed on young plants. The following are primary foliage-feeding insect pests of okra:

- Tiny, dark, very active flea beetles, which eat many small, round holes in leaves (shot holes).
- Blister beetles with narrow necks and soft, elongated bodies about $\frac{1}{2}$ to $\frac{3}{4}$ inch long, which eat both foliage and blossoms.
- Various caterpillars (such as loopers), which eat holes in leaves.
- Aphids, which damage plants by sucking juice from the foliage.

Pod feeding insects are a greater problem than foliage feeders because damage to pods or blossoms directly affects the edible part of the plant, the pod. Once flowering and pod set begin, blossoms and pods should be checked regularly for insects and feeding damage. The following are primary pod-feeding pests:

- Corn earworms, which chew holes and tunnel into pods.
- Stink bugs and leaf-footed bugs, which suck juices from both the blossom and pod, causing small, dark, raised blister-like spots on the pod. Feeding on very young pods results in a twisting and distortion of the pods (see Figure 1).

Cultural Controls. Growers can manipulate some production prac-
Figure 1. Distorted and irregular-shaped pods of okra caused by feeding damage from the stink bug. Pods are unmarketable.

Mechanical controls. To minimize insect damage to okra, first ensure that plants have favorable growing conditions such as sufficient water and fertilizer, particularly when plants are small. Strong, healthy plants are better able to tolerate insect damage. Many insects overwinter in debris and weeds, so removing these refuges in the fall after crops are harvested will reduce infestations the following spring. Also, weed control during the season around and in the field will reduce populations of many pest species, including flea beetles, blister beetles, and aphids. Early planting will reduce damage by several caterpillar species, because large populations do not usually develop until later in the season. Growers with small plantings may consider use of protective row covers early in the season to shield young plants from insect feeding.

Chemical controls. Very few insecticides are registered for okra because it is a minor crop and few companies can afford the increasing registration costs necessary to maintain a minor crop product. Therefore, frequent scouting and cultural controls are most important. Contact your county Extension agent for up-to-date recommendations on insecticides registered for use on okra.

Nematodes. Okra is infamous for its susceptibility to root-knot nematode damage. Nematode damage commonly causes irregular growth and reduced or delayed production. Okra plants damaged by root-knot nematodes are usually stunted and appear unhealthy with elongated, round swellings on both large and small roots. Okra should not be planted in an area known to have a high population of root-knot nematodes. If okra must be grown in an area where damage from nematodes is likely, then a nematicide should be applied prior to planting. Follow all label recommendations and restrictions when using these products.

Non-chemical management of nematodes can be accomplished through the use of soil solarization, crop rotation, or the use of nematode suppressive crops. Soil solarization is a means of reducing nematode populations to manageable levels where heat from the sun is the lethal agent. Solarization may also give good weed control in situations where effective herbicides are unavailable. Rotations can be a very effective means of controlling plant-parasitic nematodes. Okra or crops belonging to the same plant family should never be grown in the same location more often than every 3 years. When possible, include corn or small grain crops in the rotation sequence to reduce nematode populations. Another alternative would be to sow a nematode-suppressive crop such as bahiagrass or common vetch into the rotation sequence. These crops combat nematodes naturally by releasing compounds toxic or inhibitory to nematodes into the soil. These can be used as alternatives to synthetic nematicides or lengthy crop rotations.

Disease control. The most common disease of okra is blossom blight caused by the fungus Cuaaneaephoras cucurbitanum. Blossoms—and sometimes very small pods—are covered with a cottony growth tipped with black fungal fruiting bodies. These pods fail to develop. The disease is more severe during periods of very high humidity, which is often the entire growing season in Alabama. It is also found in rank-growing okra, particularly in partial shade. There are no effective fungicides approved for use on okra. The best control would be to avoid over-fertilization and planting in low areas or shady sections of a field. Also, avoid the use of overhead irrigation late in the day. Use overhead early in the day, providing sufficient time for plants to dry off before night.

Leaf spot of okra can be caused by a number of fungal pathogens. Leaf spot diseases rarely cause significant damage to okra in Alabama. No fungicides are currently available for control of these diseases. The best control would be to follow a suitable crop rotation sequence and to follow a balanced fertilization program.

Harvesting

Most varieties are ready to pick 55 to 60 days after planting. Pods should be harvested when they are $2\frac{1}{2}$ to $3\frac{1}{2}$ inches long (see Figure 2).

Figure 2. Well-formed, marketable pods of okra.
Generally, pods should be picked 4 to 6 days after flowering (see Figure 3). Pods can be snapped off or cut. Cutting takes longer but produces a nicer product. You should produce 200 to 250 bushels (30 to 35 pound bushels) of okra per acre on bare ground. Based on research, yields on black plastic can be two to three times greater than on bare ground.

Postharvest Storage

Okra deteriorates rapidly and is normally stored briefly to hold for marketing or processing. Large quantities are canned, frozen, or brined. Okra has a very high respiration rate at warm temperatures and must be promptly cooled to reduce field heat and subsequent deterioration.

Okra that is in good condition can be stored satisfactorily for 7 to 10 days at 45° to 50°F. At higher temperatures toughening, yellowing, and decay are rapid. A relative humidity of 90 to 95 percent is desirable to prevent shriveling. At temperatures below 45°F okra is subject to chilling injury, which is manifested by surface discoloration, pitting, and decay. Holding okra for 3 days at 32°F may cause severe pitting. Contact or top ice will cause water spotting in 2 or 3 days and should never be used to cool okra.

Fresh okra bruises easily, and the bruises blacken within a few hours. A bleaching type of injury may also develop when okra is held in hampers for more than 24 hours without refrigeration. Storage containers should permit ventilation. Prepackaging in perforated film is helpful both to prevent wilting and physical injury during handling.

For more information, see the following publications:

Circular ANR-114, “Collecting Soil And Root Samples For Nematode Analysis.”

Circular ANR-713, “Soil Solarization For The Control Of Nematodes And Soil-Borne Diseases.”

Circular ANR-30, “Nematode Control In The Home Garden.”

Circular ANR-856, “Nematode Suppressive Crops.”


Circular ANR-959

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For more information, call your county Extension office. Look in your telephone directory under your county's name to find the number.

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