



HOME STRAWBERRIES GARDEN

*G.W. Krewer and Marco Fonseca, Extension Horticulturists
 Phil Brannen, Extension Plant Pathologist*

To get a strawberry bed started, all you need is a small area that receives full sun most or all day. Strawberries will grow well in many types of soil, but the most desirable soil is fertile, medium-light in texture, well drained and with good moisture holding capacity. Avoid heavy clays, deep sands and wet soils.

After selecting the site, have the soil tested to determine lime and fertilizer needs. Also, have the soil assayed for nematodes. Your county extension office has information and supplies for making tests. If lime and/or other nutrients are needed, or nematode treatment is recommended, don't neglect to do as suggested; these treatments are essential to produce good berries.

Because of diseases, two very different production systems are used in Georgia. In the *matted row system*, plants are set out one spring and fruit the next. This system works best in north Georgia, and production may continue for several years. In the *annual hill system*, plants are set out in the fall and fruit the next spring. The planting is usually destroyed after the crop is harvested. This system works best in middle and south Georgia.

Varieties

The performance of strawberry varieties can be affected by climate and soil type. It is important to use varieties best suited to your area. Buy only certified virus-free plants from a reputable nursery. If the plants arrive and you are unable to plant immediately, store them in your refrigerator.

Varieties by Season and Areas of Adaptability

Variety	Early	Midseason
Earliglow	M, N	
Sweet Charlie	M, N	
Delmarva	M, N	
Allstar		M, N
Chandler	S, M, N (Annual hill system only)	
Camarosa	S, M (Annual Hill System only)	
Sweet Charlie	S, M, N (Annual Hill System)	

¹S-South Georgia, M-Middle Georgia, N-North Georgia
 A number of varieties traditionally grown in Georgia, such as Apollo, Cardinal, Tioga, Albritton and Delite, have become difficult to obtain.
 Apollo should be planted with another variety to ensure fruit set. Other varieties can be planted alone.
 Sweet Charlie can be grown in both the matted row or the annual hill system.

Establishment — Matted Row System North Georgia

The matted row system works well in north Georgia. In middle and south Georgia, the annual hill system is preferred because anthracnose disease often destroys the matted row plantings during the first summer before they produce fruit.

The matted row system involves planting the mother plants 2 feet apart the first spring, then letting runners fill the bed the first summer. The flowers are removed the first year, so no fruit is produced until the second year. An area approximately 8 feet wide and 30 feet long will be needed to produce plenty of berries for a family of four for year-round use. You will need 30 plants to start the bed. As mentioned before, a sunny spot with good soil is necessary if you're to be successful. Avoid planting the berries where pepper, tomatoes and potatoes have been grown in the past 5 years, since they and the strawberries are susceptible to verticillium wilt.

Weeds are the number one headache in growing strawberries. Begin preparing your bed a year in advance of planting. Periodically till or spade the area so weeds present will not produce seed and cause a future problem. This is also a good time to add lime if soil test results indicate a need.

Matted Row System

About a week before planting, broadcast 5 pounds of 10-10-10 or 4 pounds of 13-13-13 fertilizer over the 8 x 30-foot area where the strawberries will be planted. Till the soil and smooth the bed. Allow the soil to be settled by a rain before planting. When soil moisture conditions are ideal for planting (the soil is not wet), lay off two rows that are 4 feet apart. Each of the rows should be 2 feet from the edge of the bed. Set the plants 2 feet apart in the rows — you will need 30 plants for the bed. Set the plants at the correct depth as shown in Figure 1 (page 2).

The top of the crown should be above the soil line. A couple of weeks after the new plants begin to grow, flowers will appear. Remove these flowers the spring of the first year to allow plant development to occur. See Figure 2, page 2.

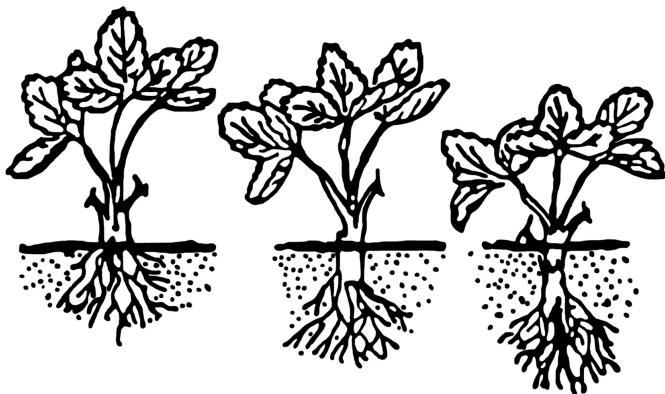


Figure 1. Plant at the correct depth.

During the summer of establishment, allow the strawberry runners to develop and form the matted row. Strawberries require 1 to 1½ inches of water per week, so water the planting if rainfall is not sufficient. And don't forget to control the number one headache — weeds. Mulching, hand pulling, hoeing and tilling are the best means of control in a small planting, although a few herbicides are available for use on strawberries. Should you decide to use herbicides, check with your county extension agent for recommendations.

Fertilize the bed twice during the first summer. Broadcast 3 pounds of 13-13-13 or 4 pounds of 10-10-10 over the bed in mid-June and again in late September. Always apply fertilizer to the plants when the foliage is dry, and sweep the plants with a broom or leaf rake immediately following application. If the soil is extremely sandy, it may be beneficial to fertilize the bed using the above rates in late May, mid-July and early October. The desired result of the first growing season is to develop matted rows 2 feet wide with a 2-foot walk space between the rows, as shown in Figure 3.

If the planting is vigorous, you will probably have to cut runners that grow into the aisle. During the winter and spring months, periodically check the planting for the development of winter weeds that should be removed. In late winter of the second and subsequent years (mid-February in middle Georgia and mid-March in the Georgia mountains), broadcast 3 pounds of 13-13-13 or 4 pounds of 10-10-10 fertilizer over the bed. Following fertilization, mulch the bed with a layer (1 to 2 inches) of pine straw before growth begins. Rake most of the straw off the tops of the plants. The



Figure 2. Remove flowers the spring of planting.

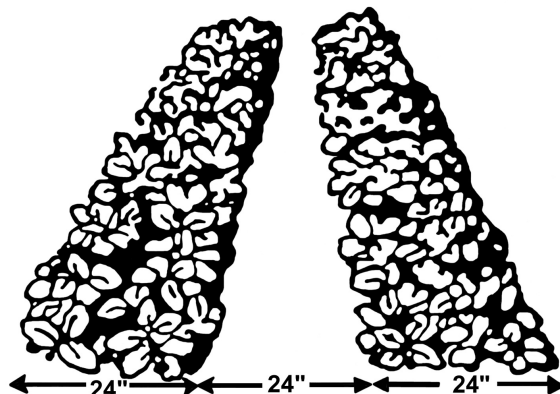


Figure 3. The matted row system for growing strawberries.

strawberry plants will grow up through the straw, and the straw will help keep the berries from getting soiled.

You will need to apply fungicides to prevent berry rots if rains are frequent during the harvest period. Insects that feed on the fruit and foliage may also be present. Contact your county extension office for recommended materials that will control these diseases and insects.

Renovate after Harvest

The day you finish picking the crop for the year is the day you should get the bed into good shape for the next season. This is in late May to mid-June, depending on where you live in the state. If it happens to be too wet to till, wait a few days.

To renovate the matted rows, mow the leaves from the strawberry plants. Be sure you mow them high enough so the lawn mower blade does not damage the crowns. Next, narrow the 2-foot wide mats with a tiller or turn the soil with a shovel so the remaining strip of plants is about 8 inches wide. Save some of the young plants instead of the original mother plants. If you don't get rid of two-thirds of the plants by tilling, then you will have too many plants for the next year. After tilling is completed, rake out as many of the plants in the tilled area as possible and smooth the soil surface. Broadcast over the bed 3 pounds of 13-13-13 or 4 pounds of 10-10-10 fertilizer, and turn the sprinkler on. Apply ½ to 1 inch of water immediately following renovation in the form of rainfall or irrigation.

If the bed is still in good condition after two picking seasons, renovate again after harvest and follow the second season recommendations so you will enjoy berries from the same bed a third year.

If you decide to start a new planting, move it to another area, since you may have a disease and/or nematode buildup. And always buy new, certified plants to use in the new bed. Old plants may have been infested with nematodes and/or viruses, which will reduce yields and fruit size.

Care after Renovation

Be sure to keep the bed free of weeds and irrigate if rain is insufficient. Strawberries need 1 to 1½ inches of water per week. Apply fertilizer two more times during the second and subsequent growing seasons. In mid-July, broadcast 2 pounds of 13-13-13 or 3 pounds of 10-10-10 fertilizer over the bed. Make the last application in mid- to late September by broadcasting 3 pounds of 13-13-13 or 4 pounds of 10-10-10 fertilizer over the bed. Don't forget to apply when the foliage is dry, and sweep the leaves free of fertilizer. By late September, the matted rows should again be 2 feet wide. Be sure to remove plants that grow into the aisle in late summer.

Winter and Spring Culture

(Third and subsequent years)

Check for weeds and remove any that are present. Fertilize using the same rate and timing as you used the previous winter. Don't forget to mulch, and keep your eyes open for fruit rots, particularly during wet weather, and insects that may eat the fruit or foliage. You may need to apply a fungicide to prevent rots, or an insecticide to control harmful insects. Your county extension agent is the person to call to find out which kinds to use.

Establishment — Middle and South Georgia — Annual Hill System

In middle and south Georgia (and during normal winters in north Georgia), strawberry plants can be set in the fall and harvested the next spring. This reduces the danger of diseases destroying your crop. The Chandler and Camarosa varieties are by far the best for the hill system, but other varieties will produce mediocre to fair results. In north Georgia, the Chandler variety is normally more productive than the Camarosa. Contact your county extension office if you cannot find plants at a local nursery.

Plants are set 12 inches apart in the row and 12 inches apart between rows on beds that contain two rows. The beds should be 6 inches high at the shoulder and 8 inches high in the center and 26 inches wide. Provide an aisle 22 inches wide between beds as a place to walk.

Before making the beds, broadcast fertilizer over the plots. Spade or disk in 3 pounds of 10-10-10 premium grade fertilizer (contain micronutrients) per 100 square feet of bed.

In the spring, if plants appear to need fertilizer, a pinch of ammonium nitrate can be dropped by each plant.

Best results are usually obtained by mulching the bed with black plastic, although pine straw and straw can also be used. Place a drip irrigation tube under the plastic. Apply the plastic before planting. Be sure the bed is well formed, firm, fertilized and very moist. See Figure 4.

Set plants from September 15 to November 1 in south and middle Georgia (usually early October is the best time). Freshly dug plants are planted and watered intensively for the first week after planting. Potted plants can also be used and require less watering to establish. If the planting is anthracnose disease free, it may live for several years and be managed as a matted row system.

Cut holes in the plastic to allow some of the runners to peg down. The original mother plants will develop many side branches called *branched crowns*. If these are left for a second year, there will be many very small fruit. If you wish to try to carry over these mother plants, clip off most or all of the side branches (branch crowns) during late fall.

Bird Control

Because not much food is available for birds when strawberries ripen, birds can be a serious problem. The most effective method to keep them from getting most of the fruit is to cover the planting with bird netting. The net will need to be anchored all the way around the planting, otherwise the birds will walk under it.

To anchor the net, place 6- to 8-inch stakes around the planting every 2 feet. Angle the stakes out away from the rows so the net can be hooked over the stakes. This will keep the edge of the net close to the ground, and keep the birds from getting under the net. It takes only a few minutes to remove the net for picking and to replace it after you are done.

Strawberry Diseases

Diseases can be a serious problem on strawberries. Anthracnose, root-knot nematode, Rhizoctonia root and crown rot, Mycosphaerella and Diplocarpon leaf spots, and Botrytis fruit rot, are threatening problems for homeowners.

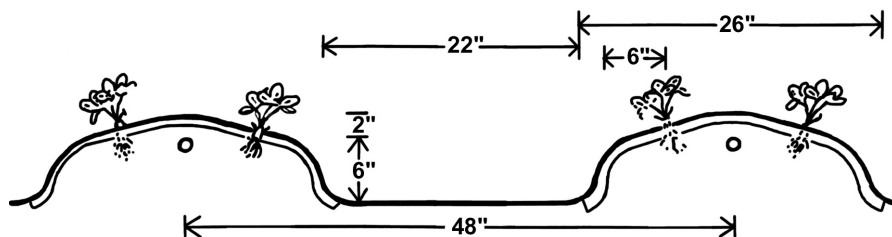


Figure 4. Cross-section of bed construction for annual hill system. Note the drip irrigation tube under the plastic. This allows the bed to be watered without wetting the fruit or foliage.

Rhizoctonia Root and Crown Rot — The root rot phase of this disease is favored by cool weather, while the crown rot is worse during hot weather. Plants typically collapse just as fruiting starts. Bottoms of leaves are purple, and the leaves curl up. The original crown is killed, and numerous side crowns may develop. This disease organism is controlled by soil fumigation. Unless clean plants are purchased, however, the disease may be introduced with the plants and, because of the lack of competition in fumigated soil, it may spread rapidly. It is important to purchase disease-free plants.

Phomopsis Leaf Blight — Phomopsis leaf spot has become increasingly important in Georgia in recent years. The disease starts to develop in the fall or spring shortly after planting. It spreads rapidly and can kill much of the foliage. It remains active as long as there is green foliage on the plants. If plants become dormant in the winter, the disease will start again in the spring.

Early symptoms are one to six circular, red to purple spots on leaflets. Spots enlarge and develop gray centers. Older spots along veins develop into large V-shaped lesions. Fruit and calyx infection also occurs. The fungus survives in dead leaves attached to the plants. Apply fungicides when new growth starts and continue application in the spring where the disease is a problem. Fruit infection is prevented by controlling foliar infection.

Botrytis Fruit Rot — Botrytis fruit rot is the most common and important fruit disease in Georgia. While rot can start on any part of the fruit, it usually starts on the calyx end or the side of fruits touching infected fruits. Affected fruit become light brown. The fungus can also invade all other plant parts. Survival of the fungus occurs in infected tissue and in large black sclerotia on the ground or plants. It germinates in the spring when bloom starts and infects bloom parts. From these, it moves into the fruit and may rot it immediately, or it may be dormant until the fruit ripens. The disease is most severe in wet weather. Apply protective fungicide sprays starting before bloom and continuing through harvest. This fungus rapidly develops resistance to fungicides, so rotate fungicides.

Angular Leaf Spot — This leaf spot bacterium survives in dead plant tissue. The disease starts as small, angular, water-soaked spots on the bottom of the leaves. Spots enlarge but are limited by the veins. Spots are translucent when viewed by transmitted light and dark green in transmitted light. Spots coalesce to cover large portions of the leaf and appear as irregular reddish-brown spots on the top of the

leaf. Heavily infected leaves usually die. The disease is favored by wet weather with day temperatures of 70 degrees F and night temperatures near or below freezing. The disease usually stops as temperatures increase in the spring.

Leaf Spot and Leaf Scorch — Leaf spot and leaf scorch, caused by the fungi *Mycosphaerella fragariae* and *Diplocarpon earliana*, respectively, cause about the same type of damage and spread in a similar manner. The spores of each fungus are usually brought into a field on new plants or spread to new areas by insects, birds or farm implements. Both fungi overwinter on infected plants.

LEAF SPOT: Leaf spot shows up first on the upper leaf surface as a tiny, round purple spot about 1/8 inch in diameter. At first, the whole spot is purple. Later, the center of the spot becomes gray and then almost white. The border remains purple.

LEAF SCORCH: Leaf scorch forms small, dark purple spots on upper leaf surfaces. These spots remain dark purple. A white center is never formed as with leaf spot. The spots have an irregular outline. When numerous, the spots run together and leaves appear to be scorched.

The loss of foliage due to these two diseases can stunt the entire plant. Severely infected plants may die. During early spring rains, spores from just a few diseased plants can multiply and spread through an entire planting.

Anthracnose — The fungus causing anthracnose infects stolons, petioles, crowns, fruit and leaves. Small dark lesions appear on stolons and petioles in the summer and girdle them, killing the leaves and unrooted daughter plants. The fungus grows from the infected petioles and stolons into the crown of the plant, causing a reddish-brown firm rot, and the plants wilt and die. The fungus causes round, brown, firm sunken spots on fruit. Normally, death of plants occurs the year after infection occurs. Buying disease-free plants is the best control measure.

Root-Knot Nematodes — Root-knot is the most common nematode attacking strawberries in Georgia. This nematode causes tiny galls (about 1/8 inch in diameter) to form on feeder roots. Several short branch roots stick out from each tiny swelling or gall. Injured plants appear stunted, take on an “off” color and produce little fruit. Weakened plants are more subject to drought damage and make fewer runners.

The root-knot nematode is most common in areas where it has been brought in on strawberry plants and in fields where peanuts have previously grown.

The University of Georgia and Ft. Valley State University, the U.S. Department of Agriculture and counties of the state cooperating. The Cooperative Extension Service, the University of Georgia College of Agricultural and Environmental Sciences offers educational programs, assistance and materials to all people without regard to race, color, national origin, age, gender or disability.

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