

STRAWBERRY OUTLINE FOR VIRGINIA GROWERS

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SOILS:

The strawberry plant is adapted to a wide range of soils. New land recently cleared is a good choice because it is relatively free of insects, diseases, and perennial grasses. Stay away from tight clay soils that bake and crack in hot weather. Use a recommended soil insecticide to kill root-feeding beetle larvae and other soil-inhabiting insects before setting plants in the field. Soil pH should be between 5.5 and 7.0 as shown by soil test.

VARIETIES:

Earlibelle - For eastern Virginia only. Vigorous, early, firm berries that hold good size throughout the harvest. A good replacement for Dixieland.

Earlidawn - One of the more recent varieties performing well in most areas of Virginia. Earliest of all varieties, but highly frost-resistant; good size, bright color, fairly firm, dessert quality, somewhat tart.

Catskill - A large, bright red, high-quality berry; usually ideal if virus-free plants are used. Should be planted in test-size area until growers are convinced they are adapted to their area. Not a good shipper, but ideal for pick-your-own plantings. Ripens midseason.

Pocahontas - Ripening season about 10 days later than Earlidawn. Berries are large and maintain large average size throughout the picking season. Fruit is glossy, vivid red, fairly uniform, and about as soft as Catskill; excellent for local sales.

Guardian - Good plant-maker with large, firm berry; bright red with large green cap. Has good quality and is very good for fresh use, shipping, processing, and for preserves. It ripens in midseason. Fall-thin to reduce plant overcrowding.

Redchief - A midseason variety also suitable for the home gardener as well as the commercial grower. Its uniform red color, sweet flavor, and firm, glossy fruit surface make it an ideal dessert berry. Size holds up well during the picking season if plants are not crowded. Fall thin to reduce overcrowding.

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Redstar - The big feature of Redstar is its unusual lateness which makes it rarely hurt by spring frosts. Fruit is large, attractive, and blunt. Freezes well.

Marlate - Ripens just ahead of Redstar, and appears to be an excellent late variety in most areas; a top producer in tests on the Eastern Shore. Large, sweet berries with stems that snap easily. Plants are vigorous and produce abundant runners.

Varieties recommended for trial planting include Sunrise, Earliglow, and Darrow, very early ripening berries performing well in Virginia; Surecrop, a midseason berry with very vigorous plants that do well on thin soil and low-fertility sites, and which usually need thinning in late summer to prevent overcrowding; Delite, a new late variety resistant to 5 races of red stele and resistant to verticillium wilt, leaf spot, and leaf blight. Fruit has good aroma and high dessert quality. Tennessee Beauty is good in western Virginia as a frost-tolerant midseason variety.

A general recommendation for western Virginia is to plant midseason and late varieties to reduce frost threat to blooms. Statewide acreage of strawberries is only about 400 acres in 1977, so early berries are not necessary. Strong local markets exist for any berries, whenever they bear. Pick-Your-Own (P-Y-O) should help increase acreage of strawberries in Virginia.

FERTILIZER:

On medium fertility sites, scatter and thoroughly harrow or cultivate into the soil 500-800 lb. of 5-10-10 fertilizer per acre. A soil test is highly recommended in order to judge fertilizer and lime needs before planting. Fertile soils may need no fertilizer before setting plants in the field if soil test indicates high phosphate and potash levels. After plants are established, an application of 16 lb. of actual nitrogen per acre may be used as a sidedressing to promote early runner growth. This aids establishment of a matted row early in the summer, but fertile soils may not need this extra nitrogen. After harvest and renovation of the matted row, 500 lb. of 5-10-10 per acre is sufficient. If heavy mulch was incorporated after harvest, use 10-10-10. Fertilization after harvest stimulates fruit bud formation for next year's crop. Fertilizers should be applied broadcast over the plants, brushing residue off the leaves. Fertilizing in mid-afternoon on a sunny, dry day, then brushing the foliage with a burlap sack will remove any fertilizer caught in the leaves. Renovation includes mowing off leaves, tilling or cultivating row middles, fertilizing, and applying herbicides.

Spring fertilization, before plants bear fruit, is not normally recommended because of the danger of excessive foliage growth and soft fruit. In eastern Virginia, on sandy soils when heavy leaching rains occur or foliage shows pale color of nitrogen deficiency, apply 50 lb. 33-0-0 per acre or 100 lb. of 16-0-0 per acre in early March.

PLANTS AND PLANTING:

Order virus-free plants from reliable nurseries early enough to allow for shipment in good condition. Plants should be set out as early in the spring as possible, when the soil can be suitably worked. Plantings made in early April have given best results in western Virginia. In eastern Virginia, plantings made in February or early March become well rooted before hot weather. For best results, only nurseries selling certified plants should be patronized.

SUMMER PLANTING OF STRAWBERRY PLANTS:

Many nurseries have modern cold storage rooms that enable them to keep fall-dug dormant plants in excellent condition for long periods of time. Development of special polyethylene liners for storage containers allows some nurseries to hold viable plants all summer. In most areas of Virginia, plants should be set before mid-August in order to become established before cold weather.

Only growers with irrigation should attempt summer-setting of dormant plants. Spacing between plants in the row should be closer than normal, such as 10-12", with rows on the standard 4' centers. The author has had excellent results with summer plantings at Blacksburg, using irrigation to avoid plant stress during dry, hot weather. For best selection of desired varieties, orders should be reserved well in advance of the desired planting date.

SPACING:

Set plants 15 to 24" apart in the row, depending on variety and soil fertility. Rows are spaced 4' apart. Runner plants are allowed to fill in the row so that the final matted row of plants should not be wider than 18 to 20". Approximate number of plants needed per acre: 5,425 to 8,750. (10,000 to 11,000 for summer planting).

PLANT SETTING:

Mechanical transplanters, such as tobacco setters, work very well if a very slow speed is used. Where hand setting must be done, these methods may be used: Mark off the field with a corn planter or sled marker. A shallow furrow may be run one way of the field and the plants set at the intersection of furrow and cross markings, or the field may be simply marked both ways and plants set at the intersection by making an opening with a hoe, trowel, or spade. Many small growers mark the field one way with a lay-off string one row at a time, keeping rows straight and 4' apart. Never allow roots of plants to become dry. Care should be taken to spread roots into a fan shape, making sure not to set plants too deeply or too shallow. The base of the crown or bud should be at soil level so that no roots are exposed.

CULTIVATION:

Plants should be cultivated soon after they have been set and about every two weeks thereafter until herbicides are applied. Cultivation should be shallow and in the same direction on each row, each time. This will help train the runner plants for the matted row system. Weeds are more easily controlled by using herbicides, if label instructions are carefully followed. Current weed control recommendations are published annually at Virginia Polytechnic Institute and State University by the Department of Plant Pathology and Physiology. They are available through the County Cooperative Extension Offices and local pesticide dealers.

BLOSSOM REMOVAL:

On most soil sites and where irrigation is not available, blossoms should be removed from plants after field setting, when early growth begins. Plant stress must be avoided, so the plants will still make a matted row the first summer after planting.

HARVESTING:

Strawberries should be picked when their color is between 3/4 to full red, depending on shipping distance to market. When picking, leave green cap and small section of stem on the fruit. This makes berries more attractive and prolongs shelf life. Strawberries should be picked in the cool of the day when possible, or moved immediately to a cool, shady place.

Fruit should be pre-cooled to about 38° to 40° before shipping. Most varieties ripen over a 2- to 3-week period and must be picked every other day. During the peak of harvest, in hot weather, picking must be done every day.

LABOR REQUIREMENTS:

Usually, only 1/4 to 1/2 acre may be grown by a family, without hiring outside help for the harvest period, unless P-Y-O is used. With present-day chemical weed killers and machinery, labor of growing strawberries has been greatly reduced. Production labor, up to harvest, using herbicides and transplanting machines to set the crop in the field, will generally total less than 180 hours per acre, for the 14-month period from field preparation to harvest. Then, for the next 3 weeks or so of harvest, all the family's available time must be spent in the berry patch.

A reasonable per-acre yield, with irrigation and good management, will run about 9,000 quarts or more. At an average picking time of 5 minutes per quart (a quart may be picked faster during the harvest peak, but slower on the early and late-ripening berries) total harvest time would total 750 hours per acre, all required in the 2- to 3-week time span. This harvest labor may be entirely eliminated by using Pick-Your-Own harvesting by customers.

Growers interested in increasing their berry acreage or reducing labor should investigate a Pick-Your-Own planting. There are many in Virginia and they are increasing, but are still not sufficient to handle local strawberry demand. If interested in a Pick-Your-Own planting, try to visit such a grower to see his operation first-hand. Successful growers using this system must enjoy working with the urban public, have ample parking area for customers' automobiles, and have an adequate play area for customers' children who should be kept out of the field. Liability insurance is a must, along with a definite method of pricing berries. Many growers use one quart to one gallon containers which never leave the farm. Customers pick into these containers, then pay for their berries before dumping them into containers they bring from home. Others price by weight, keeping prices competitive with the berries found in stores.

Pick-Your-Own Per Acre--No Harvest Labor

Field Preparation & Setting Plants	=	40 hours
Cultivation, spraying	=	90 hours
Irrigation, including frost control	=	50 hours
Supervising P-Y-O harvest & collection	=	<u>100 hours</u>
TOTAL		280 hours

INSECT AND DISEASE CONTROL:

Insects and most diseases are easily controlled in strawberries if detected in the early stages of infestation. Mites, root-feeding beetle larvae, verticillium wilt, red stele disease, and foliage diseases are among the list of berry pests found in Virginia. For latest control recommendations see the current publications from Virginia Polytechnic Institute and State University, available at County Cooperative Extension Offices and at local pesticide dealers. By reducing plant stress through good cultural practices, plantings may be kept productive and profitable for several years. Strawberries are extremely shallow rooted, with almost all their roots in the upper 8" of soil. Therefore, they are extremely drought susceptible. For dependable crops each year, irrigation is a must in most areas of the state. It will often pay for itself when used for frost protection alone, using low-volume sprinkler heads. When considering irrigation, be sure to purchase a system with frost control in mind. The tender blossoms often bloom during times of high frost probability, especially in early-spring years, and especially the early varieties. Irrigation also lowers plant stress which may reduce diseases such as black root rot.

MULCHING:

Applying winter mulch helps to delay growth of berry plants, affording some measure of frost protection. It also keeps the berries clean, allows comfortable picking in wet weather, conserves moisture during dry springs, and protects plants from heaving and freeze injury during late winter and early spring. However, mulch attracts slugs and increases slug feeding and loss of berries. An alternate plan is to mulch only row middles, or picking lanes. Mulch should be applied on dormant plants or lanes after several hard ground freezes. Around Christmas time is ideal mulch-laying season in all areas of Virginia. Straw, shredded corn fodder, or pine needles are good mulching materials. Mulching should be 2" deep over matted rows or lanes, requiring about 2 tons of straw per acre, or 80 to 120 bales per acre. Only half as much is needed if mulching only picking lanes. Shredded pine bark is also a good picking lane mulch.

When plants show signs of new growth in the spring, 1/2 the mulch is removed to the row middles. This provides light to the plants and covers the picking lanes so that berries are kept clean and pickers can kneel to harvest, free of dirt and mud. After harvest, when mulch is tilled into the row middles, extra nitrogen should be used. Example: When tilling-in old straw mulch, apply 150 lb. of 33-0-0 per acre before incorporating straw into soil, or 500 lb. of 10-10-10 for equivalent nitrogen rates.

To avoid infesting a clean berry patch with weed and grain seed in the baled straw, place bales beside field in September or October, then cut the twine so bales will loosen up. Allow rain to wet the bales or water with a garden hose, then cover with a tarp or polyethylene cover. Heat and moisture trapped under the cover will germinate almost all seed in the straw before it is ready to use in late December. Fumigation of straw mulch is recommended as an alternate method to destroy weed, grass, and grain seeds. Many growers apply a midwinter herbicide to kill grain seeds just before mulching the patch, as an alternative to wetting and covering mulch bales.

