

Strawberries in the Home Garden

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This publication gives instructions for raising strawberries in Montana's climate. It provides information about site selection and preparation, fertilizing, planting and training, winter protection, irrigation and pest control and includes a list of appropriate cultivars.



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STRAWBERRIES ARE A POPULAR SMALL FRUIT IN the home garden. You can easily produce up to two pounds of berries per square foot of garden space every summer and here's how.

Site

The best berries are produced in full sun on fertile soils with good water-holding capacity. Don't plant in low-lying frost pockets. This is especially true with strawberries since the plants are low to the ground and bloom very early, making them especially subject to frost damage.

Sandy loams, silt loams or well-drained clay loams are the best soil types. Strawberries do best in slightly acid soils (pH 6.5), but you can grow them in our slightly alkaline soils as well. In soils with a pH above 8.0, strawberry plants develop lime-induced chlorosis, or yellowing between the veins of the youngest leaves because of their inability to extract soil iron under these conditions.

Preparing the Bed

Plant on slightly raised beds to assure good soil drainage and work rotted manure or compost into the soil to improve its structure and water-holding capacity. Form the soil beds 36 inches wide and three to four inches above grade. Raised beds reduce the wasted space of many aisles. Aisles on either side of the bed can be 12 to 14 inches wide to allow for walking and movement of small equipment through the planting area (Figure 1).

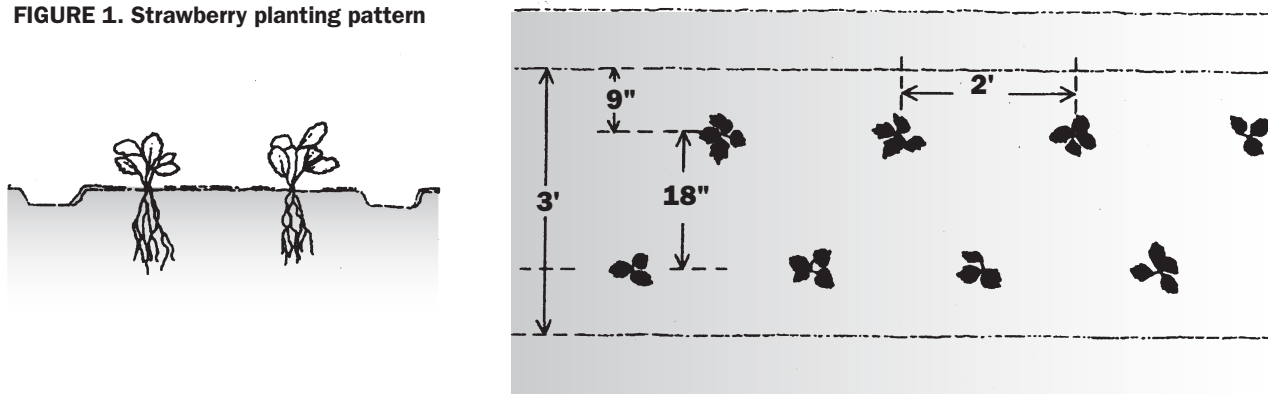
If you have very limited space, plant your berries in special "strawberry pots" which have small openings in their sides where plants are set. You can use wooden whisky barrels, too, by boring two-inch holes in their sides. Be sure you bore a hole or two in the bottom of the barrel for drainage. Another way to save space is to plant into a pyramid made up of several metal rings, wooden terraces or pots, decreasing in size from ground level to the highest tier. Make each level 12 inches smaller than the one beneath it so that, by centering it on the lower one, you allow six inches of level soil for plant growth in each tier.

Fertilizer

Nitrogen and potassium are nutrients needed in the greatest quantities for good strawberry production. Too little nitrogen results in small, light green leaves and stunted plants. Too little potassium, which is seldom a problem in our soils, causes formation of tan to brown spots at edges of leaves and between the leaf veins.

At planting, work into the top six inches of soil a complete fertilizer, such as 16-16-16, at the rate of about 1½ pounds per 100 square feet of garden area. For a bed 36 inches wide, apply this amount to 33 linear feet of row. Encourage strong vegetative growth the first season. In the second and subsequent years, don't fertilize until after harvest. Then apply fertilizer at the rate suggested above, but be sure the foliage is dry at application and sweep fertilizer granules off the leaves to reduce the chances of burning the foliage.

FIGURE 1. Strawberry planting pattern



Planting and Training

If new plants arrive before conditions are right for spring planting, hold them in the refrigerator wrapped in moist packing material to reduce drying. If that is not an option, plant them in a temporary spot in a shaded area ("heel them in") until planting.

Set plants two feet apart in the row with their crowns at soil level (see Figure 2).

Firm the soil about the plants and water them in. If you can lift the plants with a quick jerk on a leaf, the soil is too loose, and the roots may dry out.

You can plant strawberries in a matted row system, where daughter plants are allowed to develop into a solid mat; in a hill system, in which all runners are removed and only the original plants maintained; or in a spaced row system. The hill system provides the largest fruits but the smallest number of fruits. The matted row produces the greatest number of fruits, but berry size is small. The spaced row system is a compromise between the other systems and is the best suited to the home garden. Remove all but four runners from each mother plant and arrange these so that they are evenly spaced about the mother plant. Hold them in place with small stones or hairpins until they root.

With Junebearing cultivars, remove all flowering stalks that develop during the first season as soon as they appear. Letting new plants fruit before they have become established will permanently reduce their vigor and productivity. Remove the first flower stalks to appear on everbearing cultivars. These would produce the first crop of the season. If plants become well-established and appear vigorous, let the plants produce the second crop (fall crop) in the first season. For day-neutral cultivars, remove blossoms for the first six weeks after planting, then let the plants produce for the remainder of the season.

Cultivars

There are hundreds of everbearing and Junebearing cultivars and dozens of day-neutral cultivars from which to choose. Here are some old standbys and some new introductions to try in your garden.

Everbearing Cultivars

These produce two crops in one season: the first in late June and July and the second in late August and September. In short-season locations, the everbearing cultivars may not be appropriate.

Ogallala. Very hardy. Mild flavor with deep red flesh. A fair yielder and fair for freezing. Probably the hardiest everbearer.

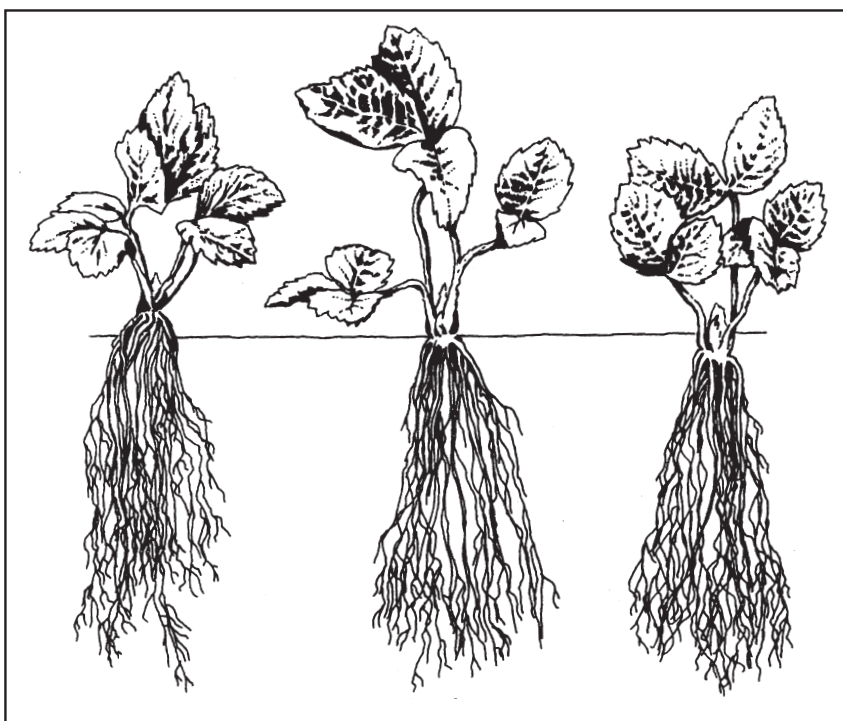


FIGURE 2. Strawberry planting depth. Left, too shallow; center, correct; right, too deep.

Gem. Very hardy and widely adapted. A good producer of medium- to large-sized fruit. Produces a heavy fall crop with very good freezing quality. Fruit will be very acid if not fully ripe.

Red Rich. One of the best-flavored cultivars. Not a heavy yielder, but the fruit is excellent for freezing. The plants produce many runners. It does best in the warmer valleys of western Montana.

Streamliner. The large fruits, excellent for freezing, are produced over a long period of time. Plants produce many runners. The first crop of the season is larger than the fall crop.

Fort Laramie. This was introduced by the Cheyenne Field Station. Plants produce good-flavored, medium-sized fruits held off the ground to reduce rot.

Junebearing Cultivars

These produce one crop per year in early to mid-summer.

Honeoye. Vigorous plants produce abundant runners and large, rot-resistant fruit.

Catskill. Hardy and produces strong plants and fruits ripening in mid-season.

Redcoat. A Canadian introduction with good winterhardiness. It is vigorous and produces many runners. The medium-sized fruits have fair flavor.

Senator Dunlap. An old cultivar with small but very high quality fruit. It is very hardy and adapted throughout Montana. The fruits are fair for freezing.

Sparkle. Ripens medium- to large-sized fruits later than most other cultivars, but is very hardy and a high yielder. The fruits have very good freezing quality.

Veestar. Another Canadian introduction producing large, firm fruits, high yields and many runners.

Glooscap. A vigorous grower adapted to Canadian gardens. Produces many runners and medium-sized fruits.

Vibrant. Another Canadian introduction that is very vigorous and productive. The fruit is medium-sized, soft and slightly dark but attractive when fully ripe.

Day-Neutral Cultivars

Day-neutral cultivars flower and fruit all summer long. In the far north you can grow them as annuals by planting early and giving them some frost protection. That eliminates the problem of winter killing. In Montana, remove the blossoms for the first few weeks after planting to establish the plants, then harvest the fruit until frost. You can extend the fruiting season well into the fall with a row covering or cold frame.

You can also grow these cultivars as fruiting house plants in a sunny location during the winter. They can fruit on unrooted runners and make attractive hanging plants.

Tribute. Produces an abundance of large-sized fruits at mid-season. Plants are resistant to powdery mildew and tolerant of verticillium wilt.

Tristar. This cultivar produces medium-sized fruits heavily in spring. The plants are resistant to verticillium wilt and powdery mildew and do best on heavier soil.

Fern. This one is high-yielding under drip irrigation and responds favorably to the use of white plastic to increase soil temperature. The fruit is medium-sized and has very good dessert and freezing quality. Like 'Tristar,' this cultivar also does well in heavy soils.

Hecker. This plant produces medium- to large-sized fruits and does best on lighter soils.

Irrigation

You need even soil moisture for best strawberry production. Drip irrigation is better than sprinkler irrigation, which wets foliage and fruit and increases rot.

Most strawberry roots are in the surface nine inches of soil, and the plant can lose up to one-seventh of an inch of moisture each day through transpiration. Therefore, you'll need to supply at least one inch of water each week to keep the plants growing well, watering deeply to encourage deeper rooting. This amount may increase in midsummer to 2½ inches, especially in eastern Montana. You may apply this in a single application where soil is loamy or in several applications in very light or very heavy soils.

Managing the Runners

Runners are the principal means for renovating strawberry beds. Root new runner plants early in the season to produce the best daughter plants.

Most cultivars produce an excess of daughter plants. Prune out the excess, leaving only four if you have trained to the spaced row system. New daughter plants produce the best fruit the following spring if each plant has at least 10 leaves by autumn.

Set new runner plants in the hill system to alternate with the mother plants. When new plants are established, remove the old ones (three years and older).

Winter Protection

Where there is no persistent snow cover through the winter, mulch your plants to reduce winterkilling of buds and frost heaving of plants. Leaving winter mulch on later in the spring can also prevent too early bloom and subsequent frost killing of the blossoms.

Sawdust, clean straw, evergreen boughs, paper and leaves make excellent mulches. Barley straw is particularly effective for winter mulch. Microfoam, a thin, white Styrofoam sheet, can be reused for winter protection each year. Apply about two inches of organic winter mulch over the plants when the soil has frozen in fall. Pull this away from the plants in the spring when the new leaves have begun to appear beneath it. Leave the mulch around the plants and in the aisles to serve as a summer mulch and to keep the berries clean.

Pest Control

Weeds

Control most weeds by a combination of mulch and hand weeding. Plastic mulches, especially the woven types, act as a weed barrier and let water and air penetrate to the soil. This is better than the solid black plastic film and the spun fiber types, which slow air and water movement. Another problem with the spun type is the tendency for mulch fiber to find its way into fruit which contact it.

Plastic mulches also don't allow for easy rooting of daughter plants. If you use straw, be certain it is weed-seed free.

Insects

Only a few insects create strawberry problems in Montana. Contact your local county Extension agent if infestation is severe.

White Grub (June beetle). These grubs are about three-quarters of an inch long, with brown heads and a white, C-shaped body. They weaken the plant by feeding on the roots. Since they are common in lawns, they may damage strawberries planted in soil previously planted in lawn.

Spittlebug. This insect surrounds itself with a foamy substance and stunts plants by sucking their juices. Since each spittle mass represents a single insect, control may not be necessary if only a few are present. Hand pick the insects or use a strong spray of water to knock them off plants.

Millipedes. The immature millipede – a thin, white, many-segmented diplopod – becomes a pest by burrowing into the ripe fruit. Millipedes are almost always present where mulches are used, since they feed on decaying organic matter.

Slugs. Slugs are closely related to snails but have no shell. They hide in damp places and are often a pest in strawberry patches. Place shallow, beer-filled cans (tuna fish cans work well) into the soil up to their rims in several areas around your patch. Slugs are attracted to the souring beer and drown.

Diseases

Viruses. Some viruses reduce plant vigor without the plants showing other symptoms. Others cause strawberry plants to be small and spindly, produce an excess number of crowns and have leaves half the size of normal ones.

Aster yellows is transmitted by leaf hoppers. Symptoms are similar to damage from 2,4-D with yellowing and cupping of leaves and general plant dwarfing.

Many viruses are spread by feeding aphids or leaf hoppers. Control insects to reduce spread of these viruses. Remove and destroy suspicious-looking plants. Buy only plants designated virus-free.

Verticillium wilt. This soil-borne fungus disease affects other garden plants and certain weeds, as well as strawberries. It's most active in cool weather when fruit is setting.

The outer leaves of infected plants wilt and dry at the margins and between the veins. Few new leaves form and newly developed shoots have blackened tips. Severe infection causes complete collapse of the plant. Less severely infected plants will be weak and succumb to winter-kill. Symptoms are usually found in mother plants but not in daughter plants.

Don't plant strawberries in soil recently planted to members of the potato family (potato, tomato, pepper, eggplant) or to strawberries. If this disease is present, use at least a five year rotation, planting no susceptible crop in that area for at least five years.

Black Root Rot Complex. This is the general name for several crown and root rot problems that produce similar symptoms. It is the result of interacting fungi, nematodes and poor soil conditions. Winter injury may also be a major contributor.

Plants suffering from black root rot complex will have one or more of the following symptoms:

- Smaller than normal root systems.
- Main roots with areas darker than the rest of the root.
- Lack small feeder roots, or feeder roots are dry, brittle or dark-colored.



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- Tips of all main roots are dead and when cut are dark throughout. Cutting vertically through the crown reveals discoloration and dark tissue.

Control measures include close examination (roots and cut crowns) of plants at planting for damaged plants, and proper fertilization to promote vigorous growth. Keep roots from drying out during planting and set plants to the appropriate depth. Changing planting location within the garden every few years helps avoid resident pathogens that could infect new plants. Plant new plants when vigor begins to decline.

Botrytis Gray Mold. This is a very destructive disease of strawberry fruit. Symptoms include a moldy appearance in blossoms or in developing green fruit. Infection often starts where the berry touches the ground, another berry or a dead leaf. As the infection becomes advanced, a dusty, gray mold covers the fruit.

Damp weather and heavy foliage favor the disease. Proper spacing and avoiding heavy matted rows allow air movement around plants. Applying nitrogen in summer and fall rather than in spring will also help reduce development of gray mold. Mulch, if not too heavy, can help isolate the berry from the soil or decaying vegetation.

Bird Control

Many berries are damaged by birds, especially robins. Scarecrows are not effective, but flagging or netting can sometimes provide good control.

Excluding the birds with netting is most effective. Plastic-impregnated paper, nylon, cotton and polyethylene nettings are sold for this purpose.

You can also drive three- to four-foot stakes into the ground at 15- to 20-foot intervals throughout the strawberry patch. Tie a strip of cloth to the top of each to act as a flag.

Another method is to continuously drive heavy (stronger than lath) stakes, four feet in length, into the ground at corners of the strawberry bed. Stretch twine between the stakes and attach streamers every five feet along the string.

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