Strawberry

Site Selection

The selection of a suitable site is essential for good strawberry production. Consider the following:

Site Preparation

Site preparation is a critical first step to successful long-term yields. Begin preparation the year before planting.

Soil

The best soil for growing strawberries is a deep, well-drained sandy-loam soil to loamy-silt soil with a good supply of humus (over 4% organic matter). These soils holds moisture well which is important for good yields. Avoid heavy clay soils as they are usually slow to drain even if there is a subsurface drainage system.
Strawberries grown in poorly drained soil are more prone to root rot problems. Coarse, sandy soils require careful attention to fertilization and irrigation for successful yields. Strawberries grow best in a slightly acidic soil with pH 5.5 to 6.5.

Drainage

Strawberry roots are injured if soils are waterlogged or flooded for more than one or two days – especially when the plants are actively growing. The roots will rot and, if damage is severe, the plants may die. A subsurface drainage system is necessary for fields that are not naturally well drained. Surface drainage provided by the slope of fields or raised beds may reduce the risk of root rot. Avoid planting on steep slopes. To prevent soil erosion, install a subsurface drainage system, plant across moderate slopes, seed fall cereal cover crops and plant grassed waterways in areas where water runs in the field.

Irrigation

Strawberries are shallow rooted. Most of the roots are in the top 15 cm of soil. Irrigation is essential for consistent high yields.
Strawberries have a low tolerance to salts. Laboratory tests of irrigation water should show a Sodium Adsorption Ratio (SAR) of less than 30 and chloride levels below 110-180 mg/L. If irrigation water has more than 500 ppm total dissolved salts (TDS) or an electrical conductivity of more than 0.7 mS/cm, its use can result in the accumulation of toxic levels of salt. Avoid fields with salt levels above 1.0 mS/cm.

Rotation

Crop rotation is a sound agricultural principle that should be followed whenever practical. Do not grow strawberries repeatedly in the same field for many years. Insects, diseases and herbicide-resistant weeds tend to increase when strawberries are grown frequently on the same site. When this occurs, strawberry yields decline. *Verticillium* wilt may be a problem in fields where strawberries, raspberries, potatoes, peppers or tomatoes were grown in the previous four or five years. When planning crops for rotating with strawberries, consider the herbicides used on a crop. For example, the herbicide Sinbar is long-lasting in the soil. Cole crops and other vegetable crops, are a good rotation crop with strawberries.

However, cole crops should not be planted within two years of a Sinbar application.

Weeds

Weed control is especially critical. Poor weed control can result in crop failure and financial disaster. Before planting, control established weeds such as quackgrass, clover, sheep sorrel, horsetail, curled dock and Canada thistle. It is also essential to reduce the number of weed seeds in the soil. For more information see “Preplow Clean Up of Weeds” in this guide and the weed control chart in this section.

Nematodes

Fields should be tested for nematodes in the spring or summer the year before planting. If required, the best time to fumigate soils is from late summer to early fall. Refer to “Nematodes” in this guide for details on soil fumigation.

Cover Cropping

Plant cereal cover crops the fall before planting to help control winter weeds and add organic matter. Plow down the cover crop in the early spring so the cover crop is decomposed before setting out the strawberry plants. Refer also to "Cover Crops" in the soil management section of this guide. For wireworm control, use treated wheat seed (see “Wireworms” in this section).

Manure

Broadcast and incorporate composted or aged manure in early spring at least two weeks before planting. This helps to increase the soil organic matter, improve soil health, and provide crop nutrients. Fresh manure can injure young plants. To reduce the risk of leaching, plant a fall seeded cover crop to trap some of the nitrogen released by the manure or fertilizer.

Apply manure at a rate that does not exceed 50 kg/ha (20 kg/acre) of available nitrogen. Strawberries require low amounts of nitrogen and this rate is nearly the maximum required. Most poultry manure contains up to 12 kg/yd^3 of total nitrogen. Some ammonia nitrogen is lost during application and losses are greater when manure is left on the soil surface for more than 12 hours. Applying and immediately incorporating about 5 yd^3/ha (2 yd^3/acre) poultry manure provides most of the nitrogen required by the strawberry crop. A soil test three weeks after applying manure will show if more nitrogen is required.

Soil pH

If lime is required to increase the soil pH, broadcast after plowing, and incorporate it into the soil at least 2 months before planting. In coastal areas, apply any time during the fall or early spring and incorporate it as soon as the soil conditions are suitable. However, in drier regions, lime should be incorporated in the fall. To lower the pH, refer to General Nutrient Management section in this guide.

Nutrients

Take soil samples in the fall before planting to plan for spring applications of fertilizer or manure. If the soil is low in potassium, broadcast and incorporate half the amount required in the spring before planting. Refer to “Nutrition” below.

Planting

Consider these points:

- ✓ Purchase plants that are certified free of viruses and other diseases. Order a year in advance to ensure availability.
- ✓ Plant early in the spring when soil can be worked—usually mid April to mid-May. Avoid planting too early in wet soil as this can result in compaction, lumpy soil, poorly set plants and more weed problems.
- ✓ If plants must be stored before planting and growth has not started, keep at 1°C to 3.5°C for up to two weeks. If growth has started, keep at 4°C to 10°C, for a short time. If no cold storage is available, put plants in a shaded, cool location and cover with wet burlap bags. Set plants as soon as possible once they are removed from the cooler. In all situations, check the plants frequently and remove plants with mould.
- ✓ On the day of planting, it is important that the plants do not dry out. Keep the plants in the shade and covered with a tarp until planting. If needed, sprinkle the top layer lightly with water to keep the roots moist.
- ✓ Set plants so the middle of the crown is at the soil level. If the crown is buried, runnering will be delayed and reduced or the crown can rot. If the roots are exposed, plants will dry out and could die. Have someone follow the planting machine to reset plants that are not at the correct depth. Also be sure the machine is set so the roots are in a vertical position after planting.

Spacing

The matted-row system is normally used for growing strawberries in BC. Plants are set out in single rows. Runners produced from these plants are trained to form a solid row of fruiting plants.

The distance between the rows and the spacing between plants varies depending upon soil productivity, plant vigour and equipment used. The outside plants in the matted row produce the most fruit so avoid wide row widths. Row and plant spacings are usually within the range given on Table 2. Generally, the best spacing is about 30 cm (12 in) between plants as this usually ensures the rows are runnered-in or matted by the end of the first season. For vigourous varieties, spacings of up to 40 cm (16 in) may be more appropriate.

With dayneutral varieties runners are generally removed to promote branched crowns. They are usually planted on raised beds with plastic mulch in double rows 20 cm (8 in) apart 150 cm (5 ft) between rows (57,000 plants/ha; 24,000 plants/acre).

Table 2. Strawberry plants per hectare and acre at various spacings

Distance between plants	**Distance between rows**			
	105 cm (42 inches)	110 cm (44 inches)	115 cm (46 inches)	120 cm (48 inches)
30 cm (12 inches)	31,746/ha 12,446/ac	30,303/ha 11,880/ac	28,986/ha 11,363/ac	27,778/ha 10,890/ac
38 cm (15 inches)	25,397/ha 9,957/ac	24,242/ha 9,504/ac	23,188/ha 9,091/ac	22,222/ha 8,712/ac
45 cm (18 inches)	21,164/ha 8,297/ac	20,202/ha 7,920/ac	19,324/ha 7,576/ac	18,519/ha 7,260/ac
50 cm (20 inches)	19,048/ha 7,467/ac	18,182/ha 7,128/ac	17,391/ha 6,818/ac	16,667/ha 6,534/ac
60 cm (24 inches)	15,873/ha 6,223/ac	15,152/ha 5,940/ac	14,493/ha 5,682/ac	13,889/ha 5,445/ac

Care in the First Year

Care in the first year should encourage quick establishment, early runner growth and strong runner plants (“daughter plants”). The number of early runners largely determines the crop size in the second year.

Plant Care

In new plantings, the traditional practice is to remove flower trusses starting when blooming begins. This may result in earlier and increased runnering, a more developed root system, more crowns, and thus a larger first-season crop. However, if plants are set at 30 cm (12in) or closer and established well, blossom removal is not necessary. Vigorous varieties that runner well, like Rainier, can be left to flower and harvested in the first year without seriously affecting establishment.

Weed Control

Apply herbicides as recommended to avoid plant injury. Misapplication of herbicides can severely set back new plants. Refer to the weed control chart in this section for suitable herbicides. Cultivation and hand weeding are usually necessary until the plants are fully established. Shallow cultivation (2.5 to 5 cm) is best to avoid damaging strawberry roots. Always cultivate in the same direction in each row so the roots of the trained runner plants are not disturbed.

Nutrition

Consider the nutrient contribution of any manure or compost added to the soil before planting, when applying commercial fertilizers. Reduce the amount of commercial fertilizer to compensate for the nutrients available from the manure. Refer to the Table, "Nutrient Content of Various Manure" in the Nutrient Management section to determine manure contribution.

Under normal conditions apply about 20 to 50 kg/ha (8 to 20 kg/acre) or 2/3 of total amount of nitrogen plus all the phosphorus and potassium requirements 5 to 7 days after planting. Apply 15 cm away from the plants on each side of the row and 7 cm below the soil surface. An additional 25 kg/ha (10 kg/acre) or remaining 1/3 of the nitrogen can then be applied in mid-summer when the plants are starting to produce runners.

High rates of potassium (over 90 kg/ha or 36 kg/acre) should be split and applied separately about 4 weeks apart. The first application should be broadcast and incorporated prior to planting and the remainder should be banded along the rows in the normal manner with the other fertilizers.

Magnesium and calcium are frequently at low levels on light, coarse, sandy soils. Soil analysis will indicate these levels.

Soil Care

Cultivate soon after planting while applying fertilizers. Then cultivate only to control weeds, to keep the soil loose for rooting runner plants, and to train unrooted runners. Avoid frequent rotovation as it damages the soil structure.