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Growing Strawberries in Idaho

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Growing Strawberries in Idaho

LEIF VERNER*

Introduction

WITH proper selection of varieties, strawberries may be grown successfully both for home use and for local markets in practically all parts of Idaho where general farm crops are produced. A small bed of strawberries is one of the most valuable parts of the home garden. From 200 to 400 feet of row devoted to this crop will adequately supply an average family with berries for fresh consumption and for canning, freezing, and preserves.

As strawberries are highly perishable, consumers have a preference for locally grown berries if these are of good varieties and have been harvested and handled in such a manner as to reach the consumer in good condition. Where there is a good local market, or where markets are within reasonable trucking distances (preferably not over 100 miles) over good roads, plantings of $\frac{1}{2}$ to 5 acres or more sometimes prove highly profitable. In planning the production of strawberries in sufficient volume for marketing a careful study should first be made of the normal demands and supplies of the markets at hand, the time of greatest demand, the most popular varieties, and the local labor supply. Some markets will be found normally well supplied with local berries, but many others will be found largely dependent on outside sources of berries which often are of unsatisfactory quality and high in price. Roadside marketing of fresh strawberries offers good opportunities near the larger urban centers of the state.

Location and Site

For profitable commercial production of strawberries, the location selected must be reasonably close to good markets. As strawberries are a highly specialized, intensive crop of a high per-acre value, the best land available is none too good. Poor or mediocre land will not justify the investment of capital and labor necessary to make the venture a success. In districts where irrigation is necessary, land should be chosen that is nearly level in order to facilitate watering. The soil chosen should be relatively fertile, well drained, and rich in organic matter. The runner plants, by which the strawberry propagates itself, do not root readily except in loose, friable, moist soil.

On light soils that warm up early in the spring the crop tends to ripen earlier. Tillage is easier and the runner plants root more readily. The heavier soils often are more productive, require less fertilizer, and ripen their crops somewhat later. While the strawberry will grow in alkaline soils, it prefers a soil of slightly acid reaction. Virgin soils newly cleared from forest are ideal. Soils having a high lime content in the upper 8 to 10 inches should be avoided in selecting land for strawberries. On such soils, which are rather common in the Snake River Valley, strawberry plants become chlorotic (yellow leaved) and do not bear well.

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In unirrigated regions subject to late spring and early fall frost the strawberry planting should be located on relatively high ground or on a slight slope in order to minimize the danger of frost injury. Rich bottomlands close to rivers or lakes that tend to eliminate frost often are excellent locations. Where there is a premium for earliness, a south slope is desirable, as the greater warmth of the soil results in earlier maturity of the crop. If earliness is not a factor of importance, a north slope is more desirable because it delays blossoming, retains the soil moisture longer, and exposes the plants to less alternate freezing and thawing in the winter.

Before planting an extensive acreage of strawberries, the local supply of available labor should be determined. Under conditions of irrigation 1 or 2 acres of strawberries will occupy the greater part of one man's time until after harvest. The operations of harvesting and packing will require from 6 to 10 additional helpers per acre. Women and children often are used to advantage in this work.

Choice of Varieties

A very few strawberry varieties, such as Dunlap and Howard 17, are widely adapted and can be grown more or less successfully almost anywhere that other varieties succeed. Most varieties, however, are much more exacting in their requirements, attaining their maximum yields and highest quality within narrower limits of soil and climatic conditions. The success of a strawberry-growing enterprise, therefore, depends in a large measure on the selection of those varieties especially well adapted to local conditions. Attention also must be given to the particular purpose for which the crop is to be grown. Some varieties are of value only for home use, others for local or distant markets, some for canning and others for freezing.

The past experience of other growers in the community serves as the best guide to the selection of varieties. Where reliable local information of this nature is not available, the following observations on some of the leading varieties grown in Idaho and adjoining states may be helpful. Small trial plantings of some of the newer kinds described might also be made to determine their merits locally. Larger commercial plantings should be limited to the well established, proved varieties.

Observations on Varieties Grown in Idaho

Early Varieties

Howard 17 (Premier)—Berry medium to large, red throughout; quality good but not equal to some of newer varieties. Plants hardy, blossoms somewhat resistant to frost injury. One of the earliest to ripen. Adapted to a wide range of soil and climatic conditions. Recommended for home use and local markets.

Blakemore—One of the newer varieties not yet widely tested in Idaho, but very promising, especially for the warmer parts of the state. Particularly recommended as a canning and preserving berry due to its high quality and high pectin content. The berries are medium large; bright, light red; somewhat tart, but good quality; very firm. Should be trained to the matted row system. On fertile soils and especially under irrigation runners of this variety should be permitted to root only until a full stand of plants, spaced 6 to 12

inches in the matted row, has been secured. Additional runner plants should be removed as they form.

Dorsett—Berry large, bright red color, flavor mild, dessert quality excellent. Too soft for long shipment, but one of the most promising of the newer varieties for home use and local markets. Has proved especially popular in the Boise and Payette valleys. Due to its tendency towards excessive runner formation, this variety should be handled like Blakemore.

Fairfax—Berries large, firm, and of a deep, bright red color; quality excellent. Mild flavored and especially popular with those who cannot tolerate highly acid fruits. Promising both for local markets and for shipping. Recommended for trial in warmer parts of the state.

Midseason Varieties

Dunlap—An old, popular variety in Idaho recommended for home use and local markets. Very hardy and somewhat resistant to drought. Berries of medium size, rich crimson with scarlet flesh. Too soft for shipping. Prefers a heavy soil. Generally well adapted to most parts of the state.

Redheart—Fruit medium to large, color deep red throughout. Quality excellent for consumption fresh, and one of the leading varieties of the Northwest for canning and freezing. A good shipper and keeper and a heavy yielder. Generally well adapted and popular in all parts of Idaho where strawberries can be grown. Highly recommended for both home use and market.

Marshall—Berry large, irregular in form, crimson with red flesh; dessert quality of the highest; flavor mild. Good for home use and local markets but too large and soft for shipping. A leading variety for canning and freezing. Favorably reported from both high and low altitudes in Idaho. Does best on fertile, irrigated land. Varies in ripening from midseason to late.

Glen Mary—Fruit large, rather soft, good red color throughout, but with occasional white tips. Quality good, flavor mild. Should be planted with other varieties to insure cross-pollination. Requires high fertility and does best under irrigation.

Belt (William Belt)—Large, irregular, scarlet berries, red to center; soft to fairly firm, sweet, of high quality. A dependable local market variety for Idaho when grown on a highly fertile soil.

Late Varieties

Aroma—Berry medium to large, quality fair to good, scarlet with red flesh. Fruit firm and a good shipper. A highly productive variety on heavy clay soils. Recommended primarily to extend the season for local markets. Ripening varies from midseason to late.

Gandy—Berry large, irregular, deep red throughout, juicy, quality good to excellent; inclined to be hollow at the core. Most productive on heavy clay soils. A better quality late berry than Aroma. Well adapted to most of Idaho, including the upper Snake River Valley.

Everbearing Varieties

Mastodon—Probably the most productive and most widely adapted of the everbearing varieties. Fruit large, attractive red color, flavor mildly acid, quality only fair. Should do well almost anywhere in

Idaho where strawberries can be grown. Recommended for small commercial plantings where there is a good market demand for fall berries. Rockhill is a better variety for home use due to its higher quality.

Rockhill (Wayzata)—Fruit large, of a clear, rich crimson color with red flesh; quality unexcelled. Less productive than Mastodon; therefore, not so profitable as a market variety. Usually a poor plant maker. Runner formation can be increased by liberal fertilization, irrigation, and removal of all blossom clusters until late summer. Recommended as the best everbearing variety for home use in Idaho.

Gem—Size medium to large; of a beautiful, clear red color. Flavor rather tart; quality good, but inferior to Rockhill. Reported to do well under conditions of heavy snow, low temperatures, and short growing season. A good yielder.

Everbearing varieties bear a moderate crop in early summer when the single-crop varieties are fruiting, and a second crop of moderate size is produced in the early fall. Between these two peaks of production there may be a few berries ripening from time to time during the summer months. Since the greatest demand for strawberries is during the canning season, when the single-crop varieties are ripening, the everbearing kinds, that generally have smaller yields at this time, usually are less profitable for market than the single-crop varieties. If there can be established a market demand for relatively small quantities of berries for dessert purposes throughout the summer and fall, the more productive everbearers such as Mastodon may prove profitable. For the most part, however, the single-crop varieties are the backbone of the commercial strawberry industry.

Establishing the Strawberry Planting

Propagation

In commercial practice strawberries are propagated almost entirely by means of runner plants. If the soil is reasonably loose and not dry, the runner plant takes root and soon becomes an independent, new plant bearing all the inherent characters of the plant from which it grew. Under favorable growing conditions these primary runner plants may give rise to secondary plants, these to tertiary plants, etc., until, under favorable growing conditions, a single original mother plant may have an offspring of dozens of young plants in a single season. Well-rooted runner plants may be lifted in the fall for immediate transplanting to a new location; they may be dug in the fall, tied in bundles of 25 plants each, and stored in a moist room at 26-34° Fahrenheit for planting in the spring; or they may be left over winter in the ground to be dug for immediate spring transplanting.

Varieties differ widely in their tendencies to produce runners. In varieties such as Rockhill that normally produce runners sparingly or not at all, it may be necessary to resort to propagation by crown division. Examination of old plants of these varieties will show that the crown consists of from three or four to twenty or more individual plants, more or less loosely grown together. These can be cut or broken apart and each portion, consisting of a few leaves and a central growing point together with a few roots, is planted separately like a runner plant. Plants from

crown divisions are inclined to be weaker and generally less satisfactory than runner plants, but sometimes offer the only means of propagating varieties that do not form runners readily. Most such varieties can, however, be induced to form runners by removing all blossoms as they appear, irrigating frequently, and fertilizing liberally with some readily available form of nitrogen. Ammonium sulphate applied as a side dressing at a rate of 150 to 200 lb. per acre should be satisfactory under most Idaho conditions.

Buying and Handling Plants

Most growers purchase their plants from nurseries or from other growers. As this involves some risk of introducing troublesome diseases and insects, special pains should be taken to make sure that stock secured from such sources is healthy and free of pests. Some nurseries bear state inspection certificates based on compliance with certain regulations designed to assure healthy, clean stock. It usually is safe to patronize such firms.

There are both advantages and disadvantages in securing plants from other growers nearby. Such plants can be dug and reset the same day. The grower has an opportunity to determine for himself the health and vigor of the plants provided he can recognize the symptoms of the major strawberry troubles. On the other hand, such local plants often are taken from an old field that has been fruiting several years, with the result that the plants are weak, possibly harbor obscure diseases and insects, and may be of mixed varieties. In most cases it probably is best to purchase plants from a nursery known to be reliable.

As soon as a shipment of plants arrives, the package should be opened and the condition of tops and roots determined. The roots usually will need to be soaked in water a few minutes and repacked. The leaves should have a fresh, green appearance and there should be an abundance of light colored, fleshy roots. If the plants are old, as evidenced by blackened roots, or if they appear weak or unhealthy, they are not worth planting and should be returned.

If the plants cannot be set in the field shortly after they arrive they may be stored satisfactorily for short periods (2 to 3 weeks) in a moderately humid cellar at a temperature of 30° to 40° Fahrenheit, care being taken to prevent drying of the roots. To hold them for longer periods it is best to cut the bundles, separate the plants somewhat, and set them temporarily, close together, in sand or soil, covering the roots completely and firming the soil about them. In a sheltered, shaded location out of doors the plants can be kept in good condition in this manner for 6 weeks or more.

Setting the Plants

In irrigated parts of Idaho where the winters are not severe, well-rooted strawberry plants can be set successfully almost any time during the growing season except in very hot weather. While planting in early fall (late August or early September) is satisfactory in the warmer parts of the state, only spring planting should be practiced where the ground is subject to freezing to a depth of 4 inches or more. Fall planting is preferred by some growers because the plants are well established by spring

and the burden of spring work is eased. The increase in growth and production of fall-set over spring-set plants usually is not great and does not always justify the extra expense involved in keeping the planting free of weeds in late fall and early spring. For most parts of Idaho early spring planting is to be preferred.

The plants should be set during cool, cloudy weather if possible. Care must be taken to keep the roots moist and the plants shaded until they are set. If the land has been properly prepared so that the soil is firm but not compact, the plants are easily set by the use of a hand dibber or a trowel, one man performing the entire operation of planting. Under favorable conditions one man can set about 3,000 plants per day by this method.

Two men working together, one using a spade and the other handling the plants, make an efficient team. One man inserts the spade in the ground and works it back and forth to make a V-shaped opening. After the spade is withdrawn the other worker places a plant in the opening, the spade is inserted again a few inches away and used to press the soil against the roots of the plant. The roots, which may be shortened about one-third to facilitate planting, are spread out fanwise as the plant is set. The soil must be pressed firmly against the roots. Set the plant at such a depth that the dividing line between crown and roots will be even with the surface of the soil. If set too deeply, soil may cover the crown and interfere with growth. If set too shallow, roots will become exposed as the soil settles.

Under dry-land conditions, if the soil requires immediate watering, a depression is made at one side of the plant for this purpose. In irrigated districts the plants usually are set on a raised bed, and water can be applied in the furrow between beds as soon as the planting operation is completed. If the soil is not well supplied with moisture at the time of planting, failure to apply water within a few hours after the plants are set will result in a poor stand.

To reduce the water requirement of newly set plants until they have become established, approximately one-half of the leaf surface should be removed at the time of planting. In humid areas, where leaf-spot may become a problem, leaves showing symptoms of this disease should be removed at this time. In bright weather a light application of straw to provide partial shade for the plants and to reduce moisture loss will prove helpful. All blossoms and blossom buds should be removed at the time of planting and at 1- or 2-week intervals thereafter throughout the first growing season. Permitting the plants to bear fruit the first season weakens them and reduces yields the next year. Everbearing varieties may be permitted to bear a fall crop the year they are planted.

Training Systems

On rich soil and with ample moisture most varieties of strawberry will produce a large number of runner plants in a single season. Up to a certain point the production of runner plants increases the productive capacity of the field. However, if too many runners are permitted to root, they may become so dense as to compete seriously among themselves and thereby reduce yields and impair the quality of the crop. The system of

training that results in the largest yields is one that permits the rooting of the largest number of runner plants possible without undue crowding, as represented by the matted row system. The highest quality berries are secured, but with reduced yields, by the hill system in which no runners are permitted to root. The hedgerow system represents a compromise between these two, in which a small number of runners, carefully spaced, are allowed to root.

The best system to follow depends upon the purpose for which the fruit is to be grown, the cost of labor, value of the land, and the varieties selected. For commercial production the matted row system is most commonly employed because of its large yields. The hedgerow system may be more profitable where there is a premium for high quality berries. For home use either the hedgerow or the hill system is most suitable. For illustrations of these different training systems see Figure 1.

The Matted Row System.—Plants are set in rows 3 to 4 feet apart, with the plants from 18 to 36 inches apart in the row. The wider spacing requires less plants per acre, but a full row of plants capable of maximum production is attained sooner with close planting. As runner plants develop, they may be permitted to root at random or they may be spaced roughly from 6 to 12 inches apart. The latter method, sometimes referred to as the "spaced row" system, requires extra labor but will pay good dividends in increased yields and better quality fruit. In spacing the matted row the runners are trained in any direction in which there is room for them without crowding. When the row has been completely filled with plants, properly spaced, to a width preferably not exceeding 12 to 15 inches, all further runners are removed as they appear. **It should be borne in mind that an excessive number of runner plants is fully as detrimental to the vigor and productiveness of a strawberry field as an excessive number of weeds.**

In varieties such as Blakemore, Dorsett, and others that form runners freely, the matted row should have its full complement of plants early in the season, leaving a long period in late summer and fall for the development of blossom buds for the next year's crop. Varieties making less vigorous growth should be encouraged in early runner production by nitrogen fertilization and by irrigation, if possible, since the runner plants formed early in the season are much more productive than those formed later. Runners rooted in June may yield from 10 to 15 times as much fruit the following year as runners rooted in October.

The Hedgerow System.—With rows 30 to 36 inches apart plants are set 18 to 24 inches apart in the row. Only a small number of the first runner plants are permitted to root. These are carefully spaced so that one, two, or three rows of plants are formed. Yields per plant are greater than in the matted row system, because stronger crowns are formed, but total yield per acre is less, due to the smaller number of runners permitted to root.

The Hill System.—Plants are set 18 inches apart in rows 24 to 36 inches apart. Where irrigation is not practiced, plants may be set 24 to 30 inches apart each way for cross cultivation. All runner plants are removed as they form. This system yields large, high-quality berries, but the total

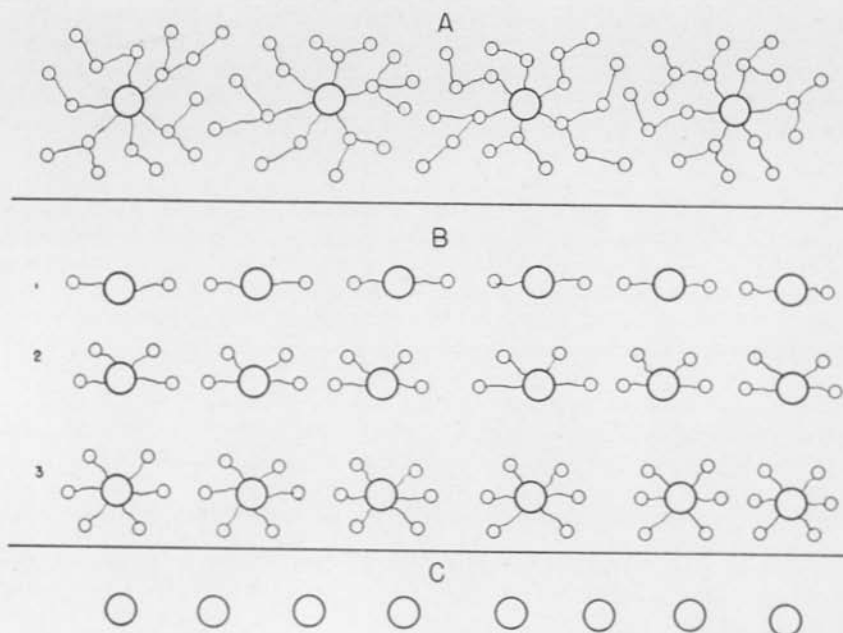


Figure 1.—Systems of training strawberry plants. Large circles represent mother plants, small circles represent runner plants. A—matted row system with spaced plants. B—different forms of hedgerow system, including, (1) single hedgerow, (2) double hedgerow, and (3) triple hedgerow. C—hill system, in which all runner plants are removed as they form.

production is lower than with the other systems described. The hill system is especially adapted to small scale production of berries for home use where large yields can be sacrificed for high quality. It requires relatively little hand labor for weeding.

Soil Management

Preparation of the Land

As weeds present one of the major problems in strawberry growing, best results usually are secured when a cultivated crop has been grown the year before setting the strawberry plants. A suitable rotation consists of alfalfa for 2 or 3 years, grain or a cultivated crop with heavy manuring (20 tons per acre) 1 year, and strawberries 2 or 3 years. The land should be plowed in the fall, and harrowed or disced in the spring just before setting the plants. If desired a cover crop of rye and winter vetch may be sown immediately after fitting the land in the fall, and turned under as soon as the soil can be worked in the spring. This practice furnishes additional organic matter and makes earlier planting possible on soils inclined to be late in drying out. Seeding should be at the rate of 60 pounds of rye and 40 pounds of vetch per acre.

Cultivation

A well-tilled soil that is always loose and friable encourages early rooting of runners and so increases the productive capacity of the planting. Cultivation should be frequent throughout the first growing season, and should be followed by hoeing and hand weeding. As strawberry plants are shallow-rooted, deep cultivation is injurious and must be avoided. Except during fruit production the soil should be worked as soon as possible after each rain or irrigation.

In fruiting years cultivation should cease when blossoming begins in order to avoid soiling or injuring berries and blossoms. As soon as harvesting is completed, regular cultivation should be resumed. In the period between harvest and cold weather the young plants have an opportunity to form more extensive root systems and to develop strong crowns. Blossom buds for the next year's crop are formed in late summer and early fall. The best possible care of the planting following harvest is, therefore, essential to the production of a maximum crop the next year.

Irrigation

Where irrigation is practiced, strawberries usually are planted on beds from 4 to 8 inches above the irrigation furrows. During the first year's growth of a new planting, irrigation should be held to the minimum that will keep the plants in good vigor, as restricted irrigation encourages good root development. During the fruiting period water should be applied every 4 to 6 days on light soils and every 7 to 10 days on heavier soils, or alternate rows may be irrigated after each picking so that there will always be firm soil for the pickers on at least one side of the row. Although less frequent irrigation is required after harvest, the plants must not be allowed to suffer from lack of water at any time. Neglect in this matter may be reflected in greatly reduced yields the following year.

Fertilization

Many Idaho soils are sufficiently rich that no fertilizers are required for satisfactory production of strawberries. When plant growth and yields are low, and there is no evidence of disease or insect troubles that might account for this condition, some fertilizer may be needed. Usually the best results are secured from well-rotted barnyard manure. This is applied at a rate of 10 to 20 tons per acre in the spring before the soil is worked. On soils where field crops are known to respond to phosphorous, an application of 200 to 300 pounds of superphosphate per acre may be applied with the manure. In the absence of a sufficient supply of manure, an application of 200 to 400 pounds of ammonium sulphate per acre may be made when the soil is first prepared in the spring, or it may be used as a side dressing 2 or 3 weeks later when growth has started. Too high nitrogen fertilization is to be avoided since it results in soft berries.

Spring applications of ammonium sulphate are useful principally in increasing yields for the current season. To induce a more vigorous plant growth and increase the set of fruit buds for the following year's crop, this fertilizer is applied in early August.

Mulching

Especially where irrigation cannot be practiced, a straw mulch is invaluable in strawberry growing. It conserves soil moisture, protects the plants against winter injury, reduces the need of cultivation and weeding, and keeps the fruit clear. Only straw free of weed seeds should be used. Old straw is safest in this respect.

A mulch for winter protection is applied in the fall after the plants have stopped growing and freezing weather has set in. The straw is applied from 2 to 3 inches deep over the entire field, completely covering the plants. This will require from 2 to 4 tons of straw per acre. Such a mulch greatly reduces injury to the plants from heaving due to alternate freezing and thawing of the soil.

In the spring shortly after growth has started and the leaves of the plants assume a yellowed appearance due to lack of light, the mulch should be removed. If the mulch was intended only for winter protection it is raked off and taken from the field. If it is intended to serve also as a fruiting mulch, merely rake it lightly from the plants and leave it on the ground between the rows. If the field was relatively free of weeds and weed seeds at the time of applying the mulch, no cultivation and but little hand weeding should be required during the growing season. As the fruit develops, it will rest on the straw and thus be kept clean. Since the straw reduces evaporation from the surface of the soil the average soil moisture content throughout the growing season is considerably greater in mulched than in unmulched soil.

Where irrigation is practiced, a straw mulch is less important and somewhat more difficult to handle. However, a winter mulch for protection of the plants can easily be applied, or a fruiting mulch may be used in the spring after the first cultivation. The straw in such a case may be placed close around the plants leaving open spaces between the rows for irrigation. It is feasible, under some conditions, to apply the fruiting mulch over the entire area between the rows if irrigation furrows have previously been established.

In commercial production of strawberries it is recommended that clean cultivation be practiced during the first season's growth of a new planting to insure control of weeds and to secure early rooting of runner plants. A mulch may then be applied for winter protection and maintained throughout the following fruiting season.

Renewal of Strawberry Planting

Since the blossoms are removed from strawberry plants during their first year in order to encourage maximum plant growth, no return can be realized until the second year. This is normally the year of maximum production, the yield tending to decline sharply in each succeeding year. This raises the question of how long a field can be maintained profitably. In many commercial strawberry districts plantings are destroyed after a single year of fruiting. In other districts it has been found profitable to maintain the planting until two or three successive crops have been taken. The best procedure to follow is determined by the cost of labor and plants to establish a new field, the cost of maintaining an old field which has a

tendency to become increasingly weedy, value of the land for other purposes, and the value of the fruit to be marketed. Under most Idaho conditions a 2-year period of fruiting probably is most profitable.

If a planting is to be maintained for more than one fruiting year, some form of "renewal" treatment to invigorate the plants retained for the next year's crop should be practiced. The primary objective of renewal treatments is to preserve the plants likely to be most fruitful, and to eliminate crowding and undue competition from excess plants. With the matted row system of training there are several methods of renewal as follows: (1) All plants on one side of the matted row, and including the old plants in the center, may be plowed out, leaving only the young plants on the other side of the row for fruiting the next year. The plants that are plowed out must be removed by cultivation or other means, an operation that sometimes proves troublesome and expensive. (2) The row may be narrowed from both sides, leaving a 5-inch strip of plants in the original center of the row. (3) A recently recommended method that results in higher yields, at least with certain varieties, consists of preserving for the second crop those plants that bore the year before. This is done by removing all runner plants at intervals of about two weeks during the first fruiting season. The older plants thus retained are well established. Relieved from crowding and competition with younger plants, they develop strong crowns and extensive root systems which are essential for heavy production.

Where a training system other than the matted row has been used, any method of renewal designed to preserve the stronger, well-rooted plants and to reduce crowding by runner plants will help to increase the yield and improve the quality of berries for the following year.

Harvesting and Handling Strawberries

Strawberries are highly perishable. Great care must be exercised in harvesting and handling the fruit. Best results are attained by picking only in the cooler hours, but not while the berries are wet. Usually all berries are picked that are red on three-fourths or more of their surface, but for local market and home use they may be permitted to color completely before picking. In plucking the berry from the vine, pickers should be instructed to break the stem without squeezing the fruit. If each picker is assigned a separate row, supervision of the crew is simplified and undesirable pickers are easily detected and removed. At the peak of the season strawberries should be harvested every day or two.

Unproductive Strawberry Plantings

There are many conditions that might cause poor growth and low yields in strawberries. When the cause is known, the condition often can be corrected and the plants brought back to a higher level of production. Among the more common causes of poor results with strawberries in Idaho are excessive crowding of the plants, weed competition, deficient soil moisture, inadequate soil fertility, lack of organic matter, an excessive amount of lime or alkali salts in the soil, injury to unprotected plants by freezing weather, and damage to blossoms by late spring frosts.

Neglect of the plants during the latter part of the growing season when fruit buds are forming for the next year's crop may result in devitalized plants and low yields the following year. Occasionally plants are barren, or nearly so, because a self-sterile variety has been planted without provision for cross-fertilization by a staminate of perfect-flowered variety. Nursery catalogs usually indicate which varieties are self-fertile and which are not, so that provision can be made for cross-fertilization where necessary. All of the varieties described in this bulletin are self-fertile, with the exception of Glen Mary, which is partially self-sterile.

Diseases or insect pests, sometimes obscure and difficult to detect, often are responsible for unsatisfactory growth and yields. If diseases are present or suspected, see Idaho Agricultural Experiment Station Bulletin 246, *Diseases of Small Fruits in Idaho*. For information on insect pests of strawberries see Idaho Agricultural Extension Bulletin 129, *Idaho Recommendations for Insect Control*¹.

¹. These publications may be secured from your County Extension Agent or from the Agricultural Experiment Station, Moscow, Idaho, or the Agricultural Extension Service, Moscow or Boise.