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STRAWBERRY CLOVER:

**A LEGUME
FOR
THE WEST**

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P. 1

U.S. DEPARTMENT OF AGRICULTURE

STRAWBERRY CLOVER: A LEGUME FOR THE WEST

*By E. A. Hollowell, Crops Research Division,
Agricultural Research Service*

Strawberry clover ¹ is one of the more important pasture legumes for seeped, saline, and alkaline soils in the Western States. Its tolerance to wet soils, and to soils containing concentrations of salt that inhibit the growth of most other crop plants, permits profitable use of much land in the West that otherwise would be wasteland. It also thrives on normal soils in that region. Although strawberry clover will live under relatively dry conditions and will survive short periods of drought, it does not grow well under those conditions. It survives flooding for 1 to 2 months.

DESCRIPTION

This clover, a perennial, spreads by means of creeping stems that root at the nodes. It is similar to white clover in appearance of leaves and stems and in habit of growth. Before plants reach blossom stage it is difficult to distinguish them from certain types of white clover. However, the flower heads, seed pods, and seed are distinctive.

Flower heads are mostly pink to white and usually are round; some are slightly pointed (fig. 1). Their resemblance to strawberries gives the clover its common name.

As the seed matures, the seed envelope becomes inflated and looks like a tiny balloon. It is gray to light brown. When the seed is ripe, the balloons break off from the heads. They may be spread by water or by the wind.

Seed color varies, but usually is reddish brown or yellow flecked with dark markings. Most samples contain a few seeds without markings. The seed is much larger than white clover seed, and slightly smaller than red clover seed.

¹ *Trifolium fragiferum*.

Figure 1.—Seed head, shattered seed envelopes (inflated calyxes), and seeds of strawberry clover. About normal size. (Courtesy of Colorado State University.)

ADAPTATION

Strawberry clover is adapted to all the Western States and to some adjacent areas, including parts of western Nebraska.

Adaptation to temperature varies with different strains. Some strains are adapted to cool climates in northern areas; other strains are adapted to milder climates farther south.

The degree of tolerance to high concentrations of salts is influenced by temperature, by moisture content of the soil, and by the kind and dispersion of salts. Because one or more of these conditions may vary widely within a short period, it is impossible to state any definite degree of salt concentration that

Figure 2.—Strawberry clover growing in association with saltgrass and sedge. (Courtesy of Colorado State University.)

this clover will tolerate. Strawberry clover has been observed making good growth in association with saltgrass and sedges in locations where the salt content of the soil was more than 1 percent (fig. 2). In established stands, plants have survived salt concentrations of over 3 percent for long periods. Under such concentrations, however, little growth is made. After the salt concentration is reduced by flooding, the plants renew growth.

The salt tolerance of seedling plants is greater under cool temperatures than under warm temperatures.

VARIETIES

Most of the named varieties of strawberry clover originated in Australia. Limited trials indicate that Australian varieties are better adapted west of the Cascade Range and the Sierra Nevada than in the region between these mountains and the Rocky Mountains. Palestine is larger and more productive than other Australian varieties tested, but it lacks winter hardiness.

Little research has been done in the United States on the improvement of strawberry clover. Salina, developed and released by the California Agricultural Experiment Station, is the only named variety that originated in the United States. It originated as plant selections from the Palestine variety. Salina is better adapted to California conditions than is Palestine.

Most of the seed available from the seed trade is harvested from strains naturalized in the region between the Cascade Range and the Sierra Nevada and the Rocky Mountains. These strains are similar in growth characteristics. Try to obtain seed produced under conditions similar to those in your locality.

SEEDBED PREPARATION

Prepare seedbeds in the fall; this permits early spring planting and thereby helps strawberry clover to get established ahead of competing vegetation.

Where possible, plow or disk thoroughly, then harrow to level and firm the soil. If the soil is too wet for tilling, the vegetation should be mowed and removed.

SEEDING

On tilled seedbeds, sow scarified seed early in the spring when the soil is moist. On ground that has had no preparation except mowing and removing vegetation, either sow scarified seed in early spring or sow unhulled seed in late winter. Seed may be broadcast or very shallowly drilled.

The seedcoats of strawberry clover are hard; even after hulling, as much as 40 to 75 percent of the seed often remains hard. Except when unhulled seed is sown in early winter on untilled ground, the seed should be scarified before planting.

Seed 2 to 5 pounds per acre. Good stands have been established by using 2 pounds, but more seed is desirable, especially if a thick stand is wanted the first year. Price may be a factor in deciding seeding rates.

More seed is required to get a good stand on poorly prepared soil than on well-prepared soil. Strawberry clover spreads rapidly and originally thin stands may become thick stands by the end of the second year.

On normal soils, strawberry clover may be spring seeded with a companion grain crop if the availability of irrigation water assures an ample supply of moisture throughout the season. On saline soils, barley is the only small grain that can be used as a companion crop; other small grains are not tolerant to salt.

CARE AFTER SEEDING

If a prepared seedbed is used, other vegetation usually will not crowd out the seedlings and prevent their establishment. When the seed is broadcast without seedbed preparation, rushes and sedges are apt to crowd out the seedlings. Mow these weeds to reduce competition.

After seedling plants are well established, the crop may be grazed. Grazing is desirable because strawberry clover withstands grazing and trampling better than competing vegetation; it spreads and becomes better established as other plants decline.

When strawberry clover is planted with grasses and other legumes in normal soils, it may be grazed at the same time as other pasture plants.

USES

Pasture

Strawberry clover is principally a pasture plant. It is palatable, is relished by all kinds of livestock and poultry, and is as nutritious as white clover. Plants grown on saline soils have a somewhat higher mineral content than plants grown on salt-free soil, but all available reports indicate that animals grazing the crop from saline soils show no bad effects from minerals. Like other legumes, strawberry clover may cause animals to bloat; necessary bloat-preventive measures should be taken.

Strawberry clover, like the low-growing forms of white clover, survives under close grazing. It may be more productive if grazed moderately, but close grazing reduces less desirable plants and encourages the spread of the clover and the development of a good pasture turf. It can be grazed continuously from early spring until late in the fall without affecting the stand, although rotational grazing probably would favor greater production.

Farmers who have used large acreages of strawberry clover for grazing claim that on similar soils the carrying capacity of strawberry clover is far superior to that of other pastures; many claim that 1 acre will carry one or two cattle through the entire growing season, if growing conditions are favorable.

Salt content of the soil may increase to the point where it inhibits growth of strawberry clover. Pastures affected by a high salt content may look overgrazed. If poor growth cannot be attributed to such causes as overstocking or lack of moisture, it may be due to too much salt in the soil. If such a problem arises, remove animals and keep them off until the clover recovers. Close grazing in late fall may result in killing of part of the stand during winter months.

Green Manure

Strawberry clover may be used as a green-manure crop. It is particularly valuable as a green-manure crop on soils where salinity prevents the growth of other legumes. It seldom grows tall enough to harvest for hay.

SEED PRODUCTION

Strawberry clover is a prolific seed-producing plant if it is properly handled. Yields usually range from 40 to 300 pounds of seed an acre; 100 pounds is about average.

The flowers of common strawberry clover are self-fertile; that is, seed will form without cross-pollination. Honey bee activity, however, assists the movement of pollen to the stigma. Honey bee colonies immediately adjacent to flowering fields will increase seed yields. The Salina variety is self-sterile and will not set seed without cross-pollination.

The blooming period of strawberry clover usually begins 2 to 3 weeks later than the blooming period of white clover. Strawberry clover completes its flowering earlier in the summer than does white clover. Under most conditions, strawberry clover does not bloom until the year following seeding. Thick stands appear to bloom more profusely than thin ones. Thin stands and unfavorable growth conditions tend to encourage formation of short-stalked seed heads that make seed harvesting difficult. Because flowering and growth habits of strawberry clover and white clover are similar, the same methods may be followed in seed harvesting. Harvesting with machinery on rough, hummocky soils is difficult, and sometimes impossible. Such soils can be disked, harrowed, and rolled early in the spring to smooth them for machine harvest in the fall. This smoothing operation will not seriously damage good stands.

Some farmers use seed crops for grazing until the first of June. The growth made after the animals are removed is followed by blooming and seed formation. This practice of grazing early in the season reduces weed growth, which often handicaps seed-harvesting operations and reduces seed yields.

Close grazing up to the time of blooming will not prevent seed production, but the heads will form close to the soil and cannot be machine harvested (fig. 3). If a seed harvest is planned, stop grazing early enough in the season to allow new growth before blooming starts. When clover is grown in soils that are strongly saline preceding and during the blooming period, the heads are short stalked.

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Figure 3.—Seed heads growing close to the ground, where many of them will be missed by harvesting machines, is typical in strawberry clover grazed up to the time of blooming.

The seed crop should be cut when the majority of the seed envelopes are light brown. Examine maturing seed to see whether it is ripe. If the seed crop is cut too early, the seed will be shrunken and immature.

Because the heads of strawberry clover shatter readily when ripe, cut and handle the crop when the heads are slightly damp. Seed envelopes are tough when damp, and seed shatters less.

The crop may be harvested with a mower and later picked up from the swath or windrow. The use of a closely set windrowing attachment or buncher on the mowing machine reduces shattering by reducing the number of times the crop must be handled. Harvesting with vacuum machines has been successful in some places where the soil surface is relatively smooth.

The seed crop may be cured in windrows or stacks, and threshed from the windrows or stacks by clover hullers or combines equipped with hulling attachments.

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