Canterbury Chamber of Commerce

Agricultural Bulletin

SUBTERRANEAN CLOVER

Prepared in conjunction with Canterbury Agricultural College, Lincoln, and Economics Dept., Canterbury College

BULLETIN CHRISTCHURCH, NOVEMBER, 1936 No. 89

Subterranean clover is a common plant of dry pastures of Southern Europe. It was accidentally introduced into Australia some 50 years ago. Of recent years it has been sown for pasture purposes, and has been the means of increasing the production of light lands to a phenomenal extent. The clover has also been grown in New Zealand for a number of years, but its virtues were not recognised until a few years ago. It is now being grown extensively on light soils in both islands, and its behaviour, so far, gives promise of its being one of the most valuable pasture plants for such soils where frosts are not too severe, and where early autumn rains are experienced. Until more is known about its behaviour on heavy land it is probably wise to confine its use to those soils which will not grow good red or white clovers.

Clovers are essential in good grazing pastures. They supply nitrogen for the grasses, increase the mineral content of the herbage, and build up the organic content of the soil. thereby improving soil fertility. Subterranean clover is outstanding in this respect. It has the capacity for growing well on light soils, and builds up the fertility to such an extent that in a relatively short period, ryegrass and other pasture plants will grow where previously these plants would not hold.

A dressing of superphosphate should be applied in the early autumn, for it is hopeless to expect a good growth without it. No other plant appears capable of making such effective use of phosphates, and unless phosphates are to be applied the clover might as well not be sown.

The Plant

The plant is an annual. In the spring it develops long runners which spread over the surface of the ground. Flower heads are produced at intervals along the runners, and when ripe these heads turn down, burying the seed in the ground—hence the name subterranean clover. The flower head possesses three or four white florets, each of which produces a single seed. When the seed has ripened in December the plant dries off.

The green herbage is palatable and nutritious and sheep and cattle thrive on it, though it is advisable to provide some dry feed when it is in a succulent state. In its dried-off state it forms a natural hay which has considerable feeding value, and sheep do well on it during the late summer and autumn period.

The seed germinates when the autumn rains supply sufficient moisture and the new plants which establish grow through the winter and flower the following spring. In old stands the seeds are usually so numerous that when germination occurs a dense mat of young plants completely covers the ground. When well established before winter, the plants are not injured by frosts such as are experienced in at least the milder districts of Canterbury. In the seedling stage, however, as with other clovers, the plants are subject to frost lift, especially if the ground is wet. For this reason, when establishing a stand, the seed should be sown sufficiently early to enable the plants to become well-rooted before heavy frosts are likely to occur. In an old stand the success of natural establishment is to a large extent dependent on the autumn rainfall. As an example: in the dry autumn of 1932, the seed did not germinate till the end of April, and in May, a week of heavy frosts destroyed a large number of the seedlings. During the last two seasons, early autumn rains and continuous wet weather have given subterranean clover an opportunity to show what it can do under ideal conditions.

Fitting In With Farm Practice

Subterranean clover provides little feed in the form of green herbage from December till new growth starts again in autumn. Where there has been a surplus growth during the spring and summer the dried-off herbage will be available for sheep whose feed demands are not great at this time of the year. They keep in good condition on the natural subterranean clover hay. It may, however, still be necessary to grow some rape or turnips or green feed of various types to cater for this period. A stand of lucerne would fit in well with subterranean clover, as it will provide grazing in the summer after having given cuts of hay or silage, or both, for the winter period. Of the pasture plants a mixture of cocksfoot, red clover (preferably Montgomeryshire) and white clover would provide grazing when the subterranean clover goes off. These fields should be lightly grazed in the spring and early summer months, while the subterranean clover is being grazed and the spell would enable the cocksfoot and clover pasture to be reserved for summer and autumn use.

The new growth will start again with the autumn rains and in a good season will provide grazing from March onwards. Some growers of subterranean clover have dispensed with their turnip crops for winter feed, but owing to the frequency of autumn droughts on the Canterbury plains it would be inadvisable to rely entirely on the clover. A reserve either in the form of a ryegrass pasture, hay (including subterranean clover hay) silage or oat sheaf chaff should be available to supplement the clover when necessary.

Methods of Establishing Subterranean Clover

Owing to the fact that subterranean clover persists in a pasture through natural re-seeding, a farmer can control only the initial establishment. Only a few pounds of seed are sown per acre, and thus every opportunity should be given to the first plants to produce as much seed as possible so that a thick stand will result in the second year. Early autumn sowing is advisable to let the plants become well-established before frosts occur.

(a) On Ploughed Ground.—One of the quickest and most certain ways to establish the clover is to drill 4-5lb with 1cwt of superphosphate with early autumn-sown oats. The clover will stand up to grazing in the winter and when the oats are shut up for a crop in spring, the clover gets an opportunity to flower and seed freely. When superphosphate is drilled with the seed, the young plants have direct and immediate access to the phosphate which is so necessary and they get a good start and develop long runners with abundant flowers in the spring. A heavy seeding is thereby secured and a more rapid cover obtained. When the new seedlings are establishing, grazing should be light to allow the young plants to become well grown before winter. A grass-seed mixture may be sown with the clover, but it is advisable to avoid sowing Italian ryegrass, as it is too strong a competitor to the clover seedlings. The grasses may not develop

quickly on poor soil, but in time they will respond to the improved fertility brought about by the clover, and a well-balanced mixture of grasses and clovers will result. Alternatively the sowings of grasses may be postponed until the clover has built up the fertility of old sub. paddock. In the autumn, after the dried off herbage has been eaten off, the surface can be worked up and the grass-seed drilled or broadcast.

When the clover is drilled with ryegrass, the spaces between the drill rows become filled with subterranean clover by the second year, overcoming one of the main disadvantages of drilling ryegrass on light land. Some stands have been obtained by drilling 2-4lb of subterranean clover and one bushel of ryegrass with the last break of turnips in late January.

(b) Surface Sowing. While drilling with superphosphate on ploughed land is recommended, there are occasions where owing to the rough or stony nature of the soil, ploughing is difficult or impossible. Subterranean clover may be established on such areas by surface sowing 3-4lb in early autumn. If possible, the surface should be torn up with heavy harrows or cultivator and the seed drilled with superphosphate. Stock are best kept off the area until the plants have become well established. It usually takes longer to establish a stand by these methods, but the clover can thus be introduced on extensive areas of unploughable country.

It will be realised that there are a number of ways to establish subterranean clover. The important points to remember are to drill with superphosphate in early autumn and to spell the stand during its first flowering and seeding period.

Harvesting the Seed

A technique of harvesting subterranean clover has been developed in Australia over a period of years, and New Zealand growers have already begun to adopt some of these methods. The first requisite is to select an area suitable for harvesting, taking into consideration the age of the pasture, the amount of seed already in the soil, the suitability of the surface of the soil and freedom from weeds and grasses which might interfere with harvesting. The area should then be lightly grazed in spring and the plants allowed to seed freely. A cut of hay will render later operation easier by removing the bulk of the leafage. When the remaining herbage has dried off it is burnt with a quick fire. The area is then harrowed to bring the seed to the surface. The best implement is the tripod harrow with a short chain harrow attached. Two strokes may be necessary even on sandy soil. The actual harvesting is then performed with a chain drum stripper with the chain set low to flick the soil, or the material may be gathered with a road grader. The grader is most suitable on sandy soils, the material being left in windrows and collected on sledges prior to stacking or threshing. Another device used in Australia is a light three-foot roller covered with a sheep skin and drawn over the harrowed surface. The wool picks up the burrs which by means of a revolving brush are swept off into an attached hopper. To get the bulk of the seed the roller needs to go over the ground three or four times. The material containing the burrs is carted direct to a clover thresher or is stacked and threshed when convenient. The cost of harvesting varies from 2d to 3d per lb, and threshing is extra. About 400lb of seed may be harvested per acre.

Precaution

In purchasing imported seed two important factors have to be considered. The first is that early maturing varieties should be avoided. A number of these early strains have been isolated in Australia, but they are unsuited to Canterbury conditions. The Mount Barker strain is probably the most suitable strain that can be obtained in any quantity at the present time.

The second precaution is that the seed purchased should be freed from soil, and the consequent danger of introducing the lucerne flea. The eggs of this insect collect in the ground, and there is a grave danger of introducing this pest unless the seed has been specially cleaned and freed from soil. Growers should insist on cleaned imported seed.

Summary

Subterranean clover is capable of producing high-yielding pastures on our light soils. If correct methods are adopted it is easily established. Observance of the following points will ensure success:

1. Sow about 4lb to the acre in the early autumn.
2. Drill the seed as shallow as possible and in contact with superphosphate (1cwt to the acre). Avoid broadcasting the seed or super.
3. Use the genuine Mount Barker strain and insist on the seed being free from any soil particles.
4. To give the plants a chance to seed, young stands should be grazed lightly in their first year.
5. Top-dress with superphosphate annually in the early autumn.
6. To ensure quick establishment of the sub. avoid sowing it with Italian.
7. On the lightest soils do not sow any grasses with the sub. These may be introduced later.
8. On poor swards sub. clover may be introduced by surface-working with grassland harrows, etc., after which the sub. and super should be drilled in.

Copies of this bulletin may be obtained from the Secretary, Canterbury Chamber of Commerce, P.O. Box 187, Christchurch.

Christchurch Press Co. Ltd., Printers.