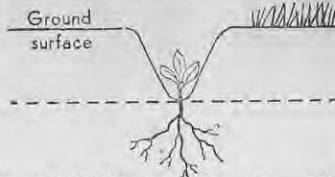


Left—Diagram of special point on coulter. The point P of the tip should be dipped slightly, and the heel H should be just below the ground surface. Below—Cross section of cut made by the drill. The seed is placed with the manure on firm moist soil, and later the young seedling is protected from drying winds.



Comparison with Surface Sowing

To compare the strike and establishment from surface broadcasting with that of drilling in the way described a block in the trial was sown broadcast by removing the coulters and allowing the seed and manure to fall on to the surface. The strike and establishment in the drilled area were strikingly better than in the broadcast block. The reasons for the difference appear to be that the bulk of the drilled seed was effectively placed in the soil whereas part of the broadcast seed was either caught up in the tussock or other vegetation or at best lay on the surface of the soil and exposed to the vagaries of the weather. The drilled seed was, on the other hand, assured of a more continuous supply of moisture, while the fertiliser placed in direct contact with the seed gave quick establishment.

Over 20 different species and strains of plants were sown by this method. Very good strikes were obtained with lucerne, sweet clover, crested wheat grass, white clover, and subterranean clover. The strike of the clovers was particularly good due to drilling and placement of the fertiliser.

It is doubtful whether the strike and establishment of seed sown in the broadcast area were one twentieth that of the drilled portion, in spite of the fact that the conditions for establishment were better than average for the district. The average rainfall is between 15in. and 20in. per annum. When the present high cost is considered the establishment in the broadcast area could not possibly be regarded as an economic proposition.

In view of the lesson learned from this trial the wisdom of surface sowing in areas of low rainfall is very much open to question.

Uses of Grassland Tip

The grassland tip would appear to have possibilities for introducing seed into native pasture where ploughing is not desirable or economic. For instance, it is likely to be valuable on tussock country where it is essential to retain the tussock or where wind blowing of ploughed or worked soil is a problem. A further possible use is for the introduction of clovers into pasture where these have failed to establish successfully. The tips have been tried out for the surface introduction of subterranean clover on light, stony soil, but though they met

with a measure of success, they were not very satisfactory under these conditions because the stones prevented good penetration and wear was excessive. The best procedure in such conditions is first to hustle twice in the same direction with narrow points, then drill with no pressure on the springs, and finally cover with the harrows. Lack of consolidation round the seed if the weather after drilling is dry is the chief disadvantage of this method.

The attachment of grassland tips to the coulter points of a drill shows promise for the surface drilling of grassland under certain conditions. The tips have yet to prove themselves for use on a wider scale. However, they would seem to be worth a trial where conditions appear suitable.

Oversowing Hill Country

SOME 70 co-operative trials on the introduction of clovers on hill country are being conducted by the Department of Agriculture as part of a topdressing improvement programme. These trials are a continuation of trials carried on since 1929 and aim at finding the most suitable clovers for different classes of hill country, the best time for sowing, the most suitable conditions for oversowing, and the best stock management for oversown areas.

WHITE clover is recommended for oversowing on the more fertile types of hill country, where the rainfall is between 45 and 50in. a year. Topdressing with phosphates is essential to the establishment and good growth of white clover. Subterranean clover is recommended for sunny, dry faces and on all country with under 45in. of rain a year. Phosphatic topdressing is also essential for the establishment and good growth of subterranean clover. *Lotus major* is recommended as a pioneer legume with or without phosphatic fertilisers in high-rainfall districts. Satisfactory establishment and growth have been obtained with red clover on the better soil types with 45 to 60in. of rain a year.

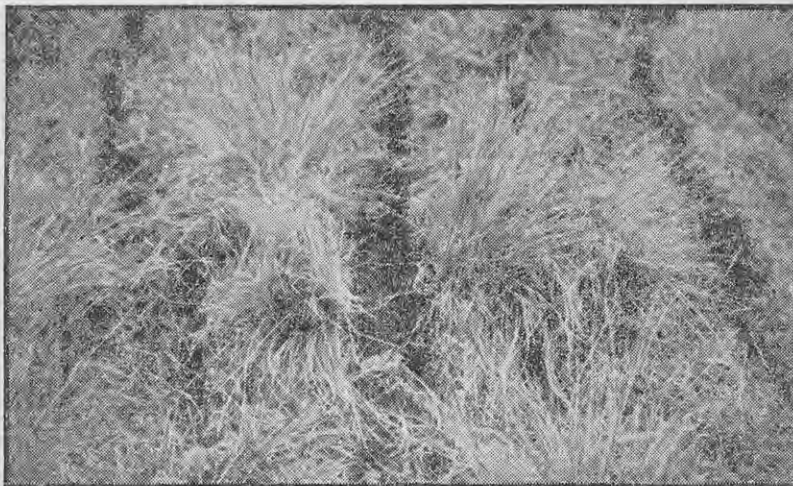
Time of Sowing

In the trials all clovers have shown better establishment from autumn than from spring sowings. Generally the earlier the seeding in the autumn the better the establishment, providing the dry summer weather has broken and there is no prolonged dry spell after seeding.

Rate of Seeding

The trials indicate that the strike is more affected by climate, type of soil, area of ground, time of sowing, and other factors than by the amount of seed sown. Very satisfactory strikes have been obtained by seeding rates of 1½ to 2lb. of white clover per acre, 3 to 4lb. of subterranean clover, ½lb. of *Lotus major*, and 3 to 4lb. of red clover. Stock management after sowing is important, particularly the spelling of newly established subterranean clover pasture to allow reseeding.

—C. J. HAMBLYN,
Fields Superintendent, Department of Agriculture,
Palmerston North



Cuts made in the surface after the drill has passed over the area. The tussock in the centre has been split in two without being pulled out. The tips will similarly cut a passage through scabweed.