Canterbury Chamber of Commerce

Agricultural Bulletin

PASTURE ESTABLISHMENT

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Inspection of many Canterbury pastures discloses the fact that a large proportion of them are poor. They consist of undesirable species and weeds, they are thin, or lack vigour and consequently give low returns. This unsatisfactory state may be due to many factors, such as inherent soil qualities, lack of manurial treatment, and bad grazing management; but it often begins with weaknesses in the practice adopted in their establishment. Some of these weaknesses are an unsatisfactory seed bed, lack of fertility, land over-cropped, land weedy, sowing too late in the autumn, and sowing with other crops. It is the object of this bulletin to show how weaknesses in establishment may be overcome.

Seed Bed for Pasture

The preparation of land for the establishment of a permanent pasture is of greater importance than for a temporary crop because the loss from a poor pasture may be felt over many years. A seed bed for grass should be warm and moist, firm, fertile, and sweet, and free from weeds. These conditions favour from the start, a rapid and complete establishment of all species sown.

Moisture and warmth are particularly important to enable quick germination.

A firm and compact soil enables a good root-hold to be developed early in the life of the young plant. A powdery seed bed allows excess aeration and sometimes too rapid drying out. Furthermore, young plants cannot develop a good root growth in an open, dry soil. Examples of the importance of firmness of a grass seed bed are seen in every newly sown paddock—at the gateways, on headlands, in drill wheel marks, and even in the hoof marks of horses. A grass seed bed can rarely be too firm. This is a point in pasture establishment which is given far too little attention.

Fertility and sweetness of a seed bed need little comment. Like moisture and warmth, their importance is more generally appreciated, although only too frequently manure is not sown with new grass. The value of raising the fertility of a grass seed bed by the use of fertilisers is so great that its use should not be neglected.

The necessity for freedom from weeds in a seed bed is obvious. The competition for moisture and plant foods, and the smothering effects of weeds such as spurry and fathen, can be almost sufficient to kill the young plants.

Preparation of the Seed Bed

A first-class seed bed can be secured only by well judged, timely cultivation. This means that all deep working should be completed to allow of a suitable fallow period of six to eight weeks before sowing. During this interval between the final deep cultivation and sowing only light cultivation should be carried out. This reduces the loss of moisture to a minimum and commences the preliminary firming process. During this fallow period, harrowing at 10-day or fortnightly intervals assists the compacting of the seed bed, conserves moisture and eradicates weed seedlings that germinate in the intervals between harrowings. If several strikes of spurry or fathen are secured it reduces considerably the subsequent competition on areas affected with these weeds. Harrowing at intervals compacts the soil from below upwards, and assists in weathering and aeration with consequent increase in fertility.

The final firming of the soil will require harrowing and one or two rollings. Compacting of the fallowed soil by these measures ensures that the moisture is close to the surface. This in turn favours germination and guards against drying out after sowing. Where the above conditions are obtained the resistance to dry weather after sowing is quite marked.

If, during the final harrowing period, continuous wet weather or other circumstances cause weeds to grow beyond the stage at which the harrows will control them, light grubbing or skim ploughing may have to be undertaken. Should this be necessary the land should be harrowed immediately after to minimise loss of moisture.

After sowing, whether by broadcasting or drilling, the area should be lightly harrowed so that the seed may be covered and the ground surface left even and friable. Where the soil is too open and not likely to cake, rolling after the final harrowing may be carried out with advantage. In windy districts rolling predisposes to soil blowing and therefore is a risky practice.

Cultivation in the preparation of a seed bed for pasture, as for any other crop, is an art and cannot be standardised like manures, seed mixtures, and strains of grasses; it depends on the skill of the operator, his implements, and power, the time and soil factor, and on a knowledge of the ideal seed bed conditions desired. The above suggestions as to cultivation, however, should serve as a useful guide. Their adoption on many different soil types has given excellent results.

Time of Sowing

Good dense swards of pasture may be obtained by sowing at any time from September to February or even March. On heavy and on some foothill lands the presence of annual weeds such as fathen and spurry (or yarr) may necessitate a longer fallow than that suggested, and under such conditions late summer or early autumn sowing is best. Late autumn sowing must be avoided in all instances where good clover establishment is desired. Young clover plants, and to a lesser extent cocksfoot plants, are more readily lifted by the frost than ryegrass plants. Further, in late autumn-sown pastures vigorous ryegrass sometimes smothers clovers. It has been shown at Canterbury Agricultural Collegs, and it is true of farms generally, that the best clover establishment is obtained by sowing either in spring or early autumn. Only occasionally has good clover resulted from sowing later than February. On most soils, however, early autumn sowing is the best, where weeds that smother spring-sown soils are a difficulty. On medium, and especially on light and low fertility soils, the successful establishment of clovers is most important. Without good clovers permanent ryegrass is often disappointing in its growth after the first year. On medium and light land the best pastures having a good development of clovers will be obtained by spring sowing. On these lands weeds that smother spring-sown pastures are few.

Sowing Alone or With a Crop

It is not possible to grow two good crops together. If good pastures are to be obtained they must be sown alone. Well-sown pastures are frequently ruined by being partially smothered by an accompanying crop and/or eaten bare and tramped out by sheep when that crop is being grazed. The advantages so often claimed for a companion crop when grass is properly sown have yet to be proved.

Pastures are frequently sown:—

1. After oats or wheat in the autumn. This method usually involves late sowing, a dry soil, low fertility, indifferent germination, and little or no clover growth, with a resultant open sward. It is more likely to be successful on moist and fertile soils, and when the early removal of the grain crop allows an adequate fallow period.

2. After oats or wheat in the autumn, with rape or oats as a cover crop. Additional feed may be obtained from the rape or oats in the autumn or early spring, but for the reasons given above the pasture is nearly always poor, with much bare ground.

3. With grain crops in the spring. On some heavy, wet soils and in wet districts this method may be satisfactory for temporary pastures. Although by sowing in this way the growth of grass may be reduced, the red clover usually does well.

4. In spring on autumn-sown crops. This method cannot be recommended as a general rule, though in favourable seasons satisfactory and cheap temporary pastures are sometimes obtained.

5. With rape or kale in the spring. This method may be satisfactory on light lands, where yields are low and cultivation costs relatively high, but the resultant pasture does not compare favourably in density of sward with one sown without a companion crop.

6. With turnips in summer. This method is rarely satisfactory. The grass grows from December to June, becomes erect and does not stool at the base, or is partially smothered. It is grazed bare, and even tramped into mud in July and August, but may come away in the spring, covering perhaps 50 per cent. or more of the field. The strike of grass with rape, kale, and turnips may be good; but on heavy and medium land these crops may grow so vigorously as to prevent the successful establishment of good pastures, by smothering and by hard eating and the unavoidably excessive tramping, when the companion crop is being fed off. On light land cultivation costs are high when contrasted with the returns per acre, so that there is a reason for attempting to establish grass with turnips, rape or kale. Successful establishment on these lands may be obtained, when grass is sown with these crops, provided the supplementary crop is poor and the young grass or clover plants are not smothered by the crop and eaten out or tramped out by the grazing of the crop. This combination of a poor crop and a good pasture introduces the idea of sowing a light seeding of turnips (3-4oz.), rape (½lb.), or kale (½-¾lb.) with the pasture seed mixture on medium and light land, to secure some supplementary feed in addition to that supplied by the new pasture, as well as to obtain reasonably cheap establishment.

When grass is sown with any of these supplementary crops, including green feed oats, it is essential that the grazing of such crops be properly carried out. Small breaks which are eaten out in one week or less, then shut up and not grazed until a well advanced grass growth permits, are necessary for the best pasture establishment. Where sheep have the run of the first break and each succeeding break until the whole crop is consumed, the long period of tramping, mud, dust, and hard continuous grazing kills many of the young improperly established plants.

On land where truly dense permanent pastures are desired, sowing alone should be the aim and should be departed from only with care. The farming programme and the crop rotation should be so adjusted to allow of establishment in the best possible manner. This has been done both with financial and with practical advantage on many properties.

Method of Sowing

The two methods of sowing are broadcasting and drilling.

Broadcasting: One of the main essentials of a good pasture is a dense and complete cover, and the absence of undesirable species. To obtain this, broadcasting on a properly prepared and fertile seed bed is essential. For permanent grazing pastures, especially on medium and heavier lands, no other method of sowing should be considered, as only by broadcasting is it possible to secure a proper distribution of seed over the whole surface.

For good results from broadcasting, the seed bed must be fine, firm, free from weeds, fertile, and above all moist. Without a suitable and lengthy fallow coupled with progressively lighter harrowing durthe last weeks of the fallow period, it is seldom possible to achieve the most satisfactory degree of firmness and moisture conservation that is essential for the rapid and complete establishment of surface-sown seeds. With broadcasting the fertiliser (the use of fertiliser is assumed) is not in direct contact with the seeds as it is when drilling is practised. This emphasises the necessity of having the best possible seed bed in order to secure quick growth when both seed and manure are broadcast.

Drilling: In Canterbury, and especially on the light lands, it is not always possible to obtain suitable conditions for broadcasting. It is under such circumstances that drilling has certain advantages, provided the seed is not sown too deeply. The small seeds are placed into the moisture, and the manure sown through the coulters is in direct contact with the young plants. These two facts enable a more rapid strike and earlier development to take place, and whatever may be the condition of the seed bed, drilling will result in a speedier and more certain germination than broadcasting.

As a general rule, drilling or cross-drilling is desirable only when the seed bed is not considered fit for surface broadcasting.

On land where red clover is somewhat difficult to establish, drilling in with lime and super does appear to assist toward better clover growth than would otherwise be obtained. It is claimed, furthermore, that on light land drilled pastures last longer and even withstand attacks from the grass grub better than do broadcast ones. The possibility of sheep tracking where pastures are drilled should be considered.

The aim in the preparation of a seed bed for pasture plants should be to attain those conditions that are necessary for broadcasting. It should be departed from only when necessary owing to conditions discussed above. On some medium and light land the final decision as to whether the seed should be broadcast or drilled might with advantage be left almost until sowing time.

Crop Rotation for Assisting Seed Bed Preparation

Preparatory crops such as turnips, greenfeed oats, etc., assist toward economical first-class pasture establishment. The cultivation for these crops, their feeding off, and the improvement in fertility and tilth thus brought about can form part of the preparation of pasture. These crops are finished and the land is ploughed after them at a time of year that allows ease in fallowing and moisture conservation. In addition, sowing takes place at the best time of the year.

Summary

1. The poor state of a pasture can often be attributed to its original establishment.

2. The seed bed should be moist and warm, firm and compact, fertile and sweet and free from weeds.

3. A proper system of cultivation and fallowing is necessary in preparing the ideal seed bed.

4. Sowing, in general, should take place from late summer to early autumn. On light land spring sowing is usually best. For the reliable establishment of clover, spring and early summer sowing is recommended.

5. The best pasture is obtained by sowing the seed mixture alone. On light and medium land, under certain conditions of management, a satisfactory pasture can be obtained by sowing a light seeding of turnips, rape, or kale as a companion crop.

6. As a rule, broadcasting should be practised, though under certain described circumstances drilling is desirable.

7. Suitable crop rotations facilitate seed bed preparation and allow economical establishment and sowing at the best time.

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

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