

so that there remains a sufficient supply of moisture to enable the plant to establish and live over what is considered to be an average period of dry conditions. Further, if this aspect is attended to in cultivation, the other soil conditions previously mentioned—that is, soil air, useful bacterial and plant food—also become fulfilled. There is no doubt that it is the moisture factor which prevents good establishment of any autumn-sown crop when it follows a stubble crop, as the previous crop has already exhausted this essential.

### Conserving Moisture

In the main, therefore, cultivation should aim at conserving soil moisture. It can, however, also dissipate mois-

ture. This is done by deep cultivation of the soil in dry conditions, and most often occurs in the preparation of turnip and swede land where the work has not been started early enough and the main object is a quick seed bed. As far as the scope of this article is concerned, moisture is taken from the soil in two ways, firstly by transpiration through the leaves of plants. If this takes place through the leaves of the crop planted and not through those of competitors—namely, weeds—the object is achieved, as in this way the plants derive their food and grow.

The second is by evaporation from the soil itself, and it is over this loss that cultivation has the greatest control. It is well known that compact firm land dries out quickly. If, therefore, pasture or stubble land is left through the winter before any cultivation is done when the intention is to sow a spring crop, the natural process of cultivation to produce the seed bed will tend to deplete what is already a precarious moisture supply. If, however, the preparatory cultivation for the same crop were done during the previous autumn and the land allowed to lie in the furrow up to the weather with the previously top-worked soil underneath, the result would have been the storing of moisture instead of its dissipation.

### Time the Essence Of the Contract

Time, therefore, is the essence of the contract. Cultivation must begin early, and while the effects of poor cultivation are not so evident in the usual autumn- and winter-sown cereals, as they undoubtedly benefit from winter rain falling on loose ground, they are evident in the all too plentiful failures of spring wheat and oats and other spring, summer, and autumn-sown seeds. The preparation of the ground must take place early, the earlier the better. This, unfortunately, is easier said than done, but a few comparatively simple changes in his programme would enable the farmer to obtain the maximum period of cultivation between crops.

Some suggestions are that rape, turnips, swedes, and chou moellier should follow a stubble crop, and that

autumn-sown grass should follow the former. These are, however, only effective when cultivation follows immediately the crop is off the ground.

### Pre-cultivation

There is no doubt that best results from pre-cultivation are obtained from topwork before deep ploughing. The straight-out ploughing of grass land 5 or 6 in. deep on soils of good depth, especially with the long mouldboard type of plough, is a hopeless proposition if soil moisture is to be conserved, the turf rotted, and a seed bed obtained. Under such conditions there is an insufficient depth of soil to secure an adequate seed bed without bringing to the surface masses of turf and endeavouring to work them down. Further, the air spaces created in the folds of the furrow prevent the turf from decaying quickly. This results in the first crop always being



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