within that environment. The Wimmera rye-grass belts in Australia are essentially drought susceptible areas of fertile soils during a few months of the year when there are sufficient rains to make that fertility available. A plant to exploit such short periods for possible growth must establish rapidly, grow rapidly, and come to maturity rapidly, so that it may ripen and shed its seed prior to the cessation of growth. The seed tides over the difficult drought period, however long, and springs into life again as soon as rains fall. A perennial species under these conditions would perish, and slower-maturing annuals, such as Italian rye-grass and Western Wolths, that did not ripen their seed during the short growing period would also perish in so far as no mature seed would be produced and shed before the drought began in earnest. There is possibly no soil-type in New Zealand where the growing season is so short that the long-maturing strains of annuals such as Italian cannot ripen their seed, and hence it is obvious that there is no place in New Zealand for such early-maturing and such short seasonal-growth annuals as Wimmera rye-grass, when annuals of a longer leaf-producing period will thrive.

There is also an important ecological fact to be borne carefully in mind in relation to annuals such as Wimmera rye-grass, and possibly subterranean clover. These annuals are really high producers, and high production is possible only when such annuals are supplied naturally or artificially with a plenteous food supply. Many of the Australian soils are what are termed self-mulching—free soils that break into powder when dry, rather than cake like cement as in the case with many soils during a dry period. In the Australian self-mulching soils the limiting factor to growth is moisture. When rain falls these self-mulching soils are highly fertile, and they remain fertile while moisture is present. Because an annual plant does well under such conditions it does not necessarily follow that it will do well when sown out on dry hard soil conditions, nor would it be expected to re-establish from shed seed wherever the self-mulching conditions are absent. If it did successfully re-establish itself its subsequent growth would be stunted and the production low.

This point is particularly stressed in view of the possibilities of importations of Wimmera rye-grass for the poor hard soils in New Zealand. There is no soil-type in New Zealand known to the writers where Wimmera rye-grass would prove superior to Italian rye-grass. Wimmera rye-grass in our trials at Palmerston North is the poorest rye-grass yet tested. It is less persistent even than the New Zealand bad false perennial.

Strain Trials.

Strain investigation into the types of Italian rye-grass was commenced in 1928 at the Plant Research Station, Palmerston North. It has been the usual practice to sow all lines in 15-link rows. For the first year this method is quite reliable for classification into types and for measuring hay yields. For periods of more than a year the method is not suitable, as the less persistent types of plants die out and the more persistent types tiller out and fill up the empty spaces. For this reason plots have been sown and single plants have been put out for trials lasting more than a year.