STRAIN INVESTIGATION OF GRASSES AND CLOVERS.

(Continued.)

ITALIAN, WESTERN WOLTHS, AND WIMMERA RYE-GRASSES.

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ITALIAN rye-grass, Western Wolths rye-grass, and Wimmera rye-grass are all short-lived species. Italian lasts well for twelve months, Western Wolths for round about six months, and Wimmera about three months. Each species has a more or less specific niche in arable and grassland farming.

The annual crops of the world from a food and clothing point of view are of paramount importance. The annual enables profitable land exploitation over a much wider front than is the case with the perennial. In grassland farming the annual species greatly extend the range of soil types that can be successfully farmed per medium of the grazing animal.

The reason why the annual is successful where the perennial fails, in so far as bulk is concerned, lies in the simple fact that soil aeration and moisture absorption and conservation are improved through the cultivation and soil mulching that precede the sowing of the annual. Artificial manures applied at seeding-down time are incorporated deeper in the soils in contact with soil moisture, and this makes manuring on the drier soil effective and profitable, whereas those manures applied to the dry surface in permanent grassland may be unavailable to the plant. Successful exploitation of the high-producing annual grassland species such as Italian, Western Wolths, and Wimmera rye-grasses therefore demands the annual breaking-up and cultivation of the land prior to seeding. Without this annual breaking-up and cultivation—unless one happens to be farming on soils that are self-mulching during periods of drought, or on extremely fertile soils that are sufficiently fertile to establish the annual from shed seed without the assistance afforded by breaking up and cultivation—the high-producing annuals are of little or no value to the grassland farmer. Perennial species on dry soil or on low-fertility soils are universally low-producing. Their production increases as the available soil fertility increases, until a point is reached where the high-producing perennial species will yield equally, or almost so, to the high-producing annual species, and there is a point in grassland farming where the extra production from the annual species over and above that possible from perennial species on the same soil-type does not pay for the added cost of cultivation, seeding, and loss of feed while the ground is under cultivation. This economic factor really delineates arable farming, short-rotation farming, and permanent grass farming the one from the other.

In short-rotation farming the grassland area on the farm usually rapidly deteriorates in carrying capacity in the second, third, and subsequent years, until it again is broken up in the course of the rotation. The choice of species and strains of these for the short-rotation pasture may, however, greatly influence the production of