

percentage of *Poa trivialis* (just as in the case of a high percentage of white clover) indicates a weakness in the rye-grass content of the pasture.

YORKSHIRE FOG (*Holcus lanatus*).

This cosmopolitan species in many respects demands the same conditions for its spread as does *Poa trivialis*. Moderately rich soil with damp surface conditions are most congenial, and given such conditions spread of Yorkshire fog may be quite rapid, either by establishment of seed or by stem and crown tillering. A weak, drowned-out, open turf affording little competition favours Yorkshire fog and *Poa trivialis* alike. Yorkshire fog, however, has an extremely wide habitat range in comparison with the comparatively narrow habitat range of *Poa trivialis*. It will thrive on the most fertile of soils, and under rank growth conditions may become dominant; it persists strongly on dry light soils and on stiff clay soils. In fact, this grass is to be found on almost every type in varying degree, contributing often a quota of feed that is seldom appreciated by the farmer. Under dry conditions it persists by means of crown tillering rather than stem tillering, and stimulates the tussock form rather than turf grass. This flexibility of form in Yorkshire fog would appear to govern its wide range persistency.*

As a competitor to strong-growing, well-utilized rye-grass Yorkshire fog takes second place, and this is the point we particularly wish to make in regard to the Hawke's Bay and Poverty Bay pastures. An increase of Yorkshire fog—just as in the case of *Poa trivialis*—indicates a weakness in the rye-grass brought about either by too much wet in the winter, too much rank growth in the spring, or too low a soil-fertility upkeep.

The relative position of rye-grass on the one hand and Yorkshire fog and *Poa trivialis* on the other are clearly exemplified in Fig. 6.

Suggestions for Control of the Annual.

From the foregoing matter it will be seen that an annual relies on abundant reseedling for its propagation from year to year. It has to re-establish from that seed, and for successful re-establishment competition from existing adult plants of perennial species in the pasture must not be too severe. Here is the weak link in the life-history of the annual, and it is at this weak link that the farmer's efforts must be levelled. The aim must be to so manage the pastures that the perennial plants of the sward—rye-grass, white clover, and other bottom grasses such as *Poa trivialis* and crested dogstail—shall spread or tiller out rapidly after any opening-up by whatever cause—by treading, through drought, or by smother caused by hay or seed crop. In any recovery period the sward must be tightened up so as to stifle the annual species during this initial phase of its re-establishment.

In the majority of the better-class pastures of Hawke's Bay and Poverty Bay there seems sufficient rye-grass present to effect the desired thickening-up of the existing sward with a view to preventing the establishment of the annual seedlings, but there is no doubt that to do this systematic manuring, properly applied, must be practised. From an analysis of patches which stock have manured heavily it is

* Strain selection work on Yorkshire fog now being undertaken by the writers may throw more light on the reason for the wide-persistency range of this species.