YORKSHIRE FOG IN MOUNTAIN REVEGETATION

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RAPID ESTABLISHMENT and aggressive spread of plants, normally regarded as weed qualities in lowland pastures, are desirable qualities for pioneering eroded mountain slopes.

Moore (1954), during the early stages of the study of vegetative recovery on Molesworth station, noted the ability of Yorkshire fog (*Holcus lanatus* L.) to establish and survive in sheep's sorrel (*Rumex acetosella*) communities. K. F. O'Connor (pers. comm.) noted that amongst 65 grass cultivars in an establishment experiment at Broken River in 1958 Yorkshire fog was oae of the least damaged by frost 'heaving.

Investigation of the potential of Yorkshire fog as a pioneer grass species on exposed mountain subsoils in more humid zones was begun by the Tussock Grasslands and Mountain Lands Institute in 1965. Seed of 'Massey Basyn' Yorkshire fog was available at this time in quantity sufficient for small-scale trials end this selection has been used as the standard cultivar since. In the assessment of all field trials, the emphasis has been on the provision of ground cover. The cover has been estimated visually as a percentage of plot area, or has been estimated mechanically by point frame. There has been no field measurement of dry matter production. In all trials, too, comparison has been made under conditions of heavy initial applications of nitrogen and phosphorus on subsoils of very low fertility.

The establishment and persistence of ten herbaceous species, including Yorkshire fog, was studied over a five-year period at three high-altitude sites (Dunbar, 1971). Yorkshire fog produced the most vigorous growth and the most complete ground cover at all three sites in the first season. It was less variable in production of cover throughout these sites than Chewings fescue, browntop and cocksfoot. It maintained the best cover on two sites in the second season but thereafter declined more rapidly than several other species, notably Chewings fescue and browntop. After five growing seasons, Yorkshire fog cover had fallen below the level of Chewings fescue on two of the three sites,

and below browntop on two out of three, but was still better than cocksfoot on all three sites. There was a prolific flowering and seed set by Yorkshire fog in the second year at all sites and, at the driest site, it was the most aggressive volunteer species. Browntop was a: more successful volunteer at the two wetter sites.

A similar trend in cover was shown in two trials at Black Birch and Porter's Pass where Yorkshire fog, browntop and Chewings fescue were used as base covers for tussock seeding (Dunbar, 1974a). Trends for a five-year period are shown in Fig. 1.

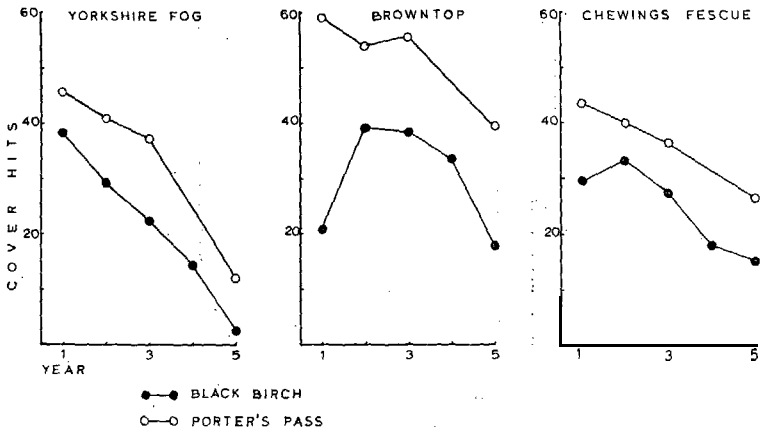

FIG. *two sites.*

In a more widespread series of trials designed principally to determine nutrient needs for high-altitude revegetation it was possible to compare Yorkshire fog and cocksfoot over three years at eight sites. Full description of these sites has been given elsewhere (Dunbar, 1974b). They were all extremely eroded, and came within an altitudinal range of 840 to 1 430 metres above sea level. Ground cover comparisons for the first and third seasons are shown in Table 1. Yorkshire fog proved better than cocksfoot in six of the eight sites, although significantly better in only three. In general, the cover advantage was maintained to the third year but by that time a larger proportion of the Yorkshire fog cover was dead material. Thus at Black Birch and Craigieburn 66% and 68% of fog cover, respectively, was dead material compared with 57% and 58% for cocksfoot.

TABLE 1: GROUND COVER COMPARISONS AT EIGHT SITES
(Percentage area estimates)

Site	First Season			Third Season		
	Yorkshire Fog	Cocksfoot	Significance of Difference	Yorkshire Fog	Cocksfoot	Significance of Difference
Black Birch	34	31	N.S.	26	15	**
Craigieburn	67	53	**	61	56	N.S.
Dogs Range	43	31	**	23	21	N.S.
Ohau	35	34	N.S.	23	18	N.S.
Dunstan	30	35	N.S.	14	15	N.S.
Carrick	16	10	**	28	9	**
Mid Dome	23	23	N.S.	16	15	N.S.
Takitimu	45	44	N.S.	17	9	**

* $P < 0.05$; ** $P < 0.01$; N.S., not significant.

The apparently shorter life span of Yorkshire fog under these conditions is no real disadvantage when a mixture of species is sown. It is outweighed by the ability of Yorkshire fog to colonize and stabilize denuded slopes rapidly, thus giving more slowly establishing, longer lived species the opportunity to succeed.

REFERENCES

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