

## Recent Research Work



PASTURES

INVESTIGATIONAL work with pasture species has recently been concentrated on problem soils such as peats, sands, light and droughty soils, and tussock areas. Considerable progress has been made in defining species of value under these conditions.

**DROUGHTY LAND** SOME 40 trials with pasture species were sown on light or droughty land, most being in Canterbury. In all these trials cocksfoot, Montgomery red clover, and subterranean clover (especially the Tallarook variety) have been the outstanding species both to establish and to survive. Lucerne also established well, but when sown alone it usually gave too open a sward and allowed heavy weed invasion. Other useful species were alsike clover, crested dogstail, sheep's burnet, chicory, and yarrow. Ryegrass usually established well, but dried off in summer and became coarse and unpalatable while cocksfoot at this time was still giving good food. Lespedeza was tried in one trial, but did not survive a dry summer and a cold, frosty winter. *Phalaris tuberosa* was satisfactory on light and droughty land, as it survived both drought and frost. It combined well with lucerne as also did cocksfoot. It was found that a moderate intensity of grazing gave best results on this type of land. This allowed annual plants to re-establish from seed, and the maintenance of a surface cover conserved soil moisture. Under a long period of spelling many plants dried off, whereas they maintained some growth with moderate grazing. In all trials lime and phosphate applications gave marked responses.

**COCKSFOOT AND LUCERNE** Several trials have investigated the seeding rates of cocksfoot and lucerne in a lucerne-cocksfoot mixture. Rates of cocksfoot varying from 2½lb. to 12lb. with 12lb. of lucerne were compared. All rates gave a satisfactory sward in the early life of the pasture, but later the low rates of cocksfoot resulted in a patchy, open sward, and in the heavy rates the grass dominated the lucerne. For a well-balanced lucerne-cocksfoot mixture of high productivity rates up to 5lb. of cocksfoot and 12lb. of lucerne gave best results in most localities. Methods of sowing were compared. In most trials drilling gave better establishment than broadcasting, but after the first year differences were usually small. Cover crops in trial sowings did not aid pasture establishment, as they gave too much competition for available moisture, although they tended to reduce the amount of weeds.

**PHALARIS TUBEROSA** Numerous trials have been carried out to investigate the use of *Phalaris tuberosa* in seed mixtures to be sown under a variety of conditions such as on light and droughty land and to determine its use in special-purpose pasture mixtures. In all trials the establishment was good and was followed by initial vigorous growth, especially in spring. However, this was often followed by a period of slower growth during which it appeared that the *Phalaris tuberosa* could

not compete with volunteer and weed grasses and with red clover and in which in some cases it was completely smothered. Within two seasons after sowing only a few spindly, low-producing plants remained in most trials. *Phalaris tuberosa* is more tolerant of hot, droughty conditions than perennial ryegrass, but cocksfoot is often just as good or better under these circumstances. *Phalaris tuberosa* combines well with lucerne and although this mixture in trials has not produced as well as the cocksfoot-lucerne combination, the grass-lucerne balance is more easily maintained because of the non-aggressive nature of phalaris. Because of its growth habit it does not usually persist well under hard grazing. In all trials except one the unpalatability of phalaris was very noticeable even when in a succulent condition.

—P. B. LYNCH

**CONTROL OF WEEDS IN GRASS SEED CROPS** EXPERIMENTAL work clearly showed the value of hormone weedkillers for the control of thistles, hedge mustard, and other common weeds of grass seed crops. No damage occurred to the grass crop, provided the application was made before flower head formation. The standard practice is to hard graze, spray, then shut the area up for a seed crop. Attention is now being given to the possibility of suppressing annual weed grasses such as barley grass, hair grass, and goosegrass in stands of perennial grasses. Trials have been started using the two grass killing chemicals I.P.C. and T.C.A. at low rates. The rates employed are sufficient to kill germinating annual and seedling grasses. The ultimate effect on the established perennial grasses is still to be determined, but so far no visible damage has occurred.

**TOLERANCE OF CLOVERS TO WEEDKILLERS** Numerous trials in the past have shown that clovers offer varying tolerances to weedkillers. White clover is more tolerant to hormone weedkillers than red clover or annual clovers. Clovers show a marked variation in tolerance to various formulations of weedkillers. Experimental work has proved that the sodium salt of M.C.P. is the most selective preparation, followed by the water-based preparations of 2,4-D, the water-based ester of 2,4-D, and the butyl ester of M.C.P. The oil-based esters of 2,4-D are particularly lethal, especially in the early stages of growth of the clovers. Trials have shown that, provided the area is closely grazed and spraying is conducted after 2 or 3 days of fine weather, most weeds in white clover crops can be controlled without damage to the crop. More damage occurs with red clover. A particular weed of red clover stands is docks. Trials have shown that docks may be controlled with the water-based ester of 2,4-D and with the N-butyl ester of M.C.P. Trials are being commenced to determine whether red clover will show sufficient tolerance to these chemicals to permit the eradication of docks in such crops. Further work is being carried out on the elimination of weed clovers such as suckling clovers in established perennial clovers.

—L. J. MATTHEWS