Molybdenum deficiency on lighter soils

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and when once established it is only a matter of time before seeds from the new plants are being deposited still further afield.

The Cape gooseberry for instance, is widely established along the creeks of the south coast, having been brought to the area by this means. Several other species of the gooseberry type are also naturalised in the State and could become widely dispersed because of their edible fruits.

The most successful and most widely distributed weed of this type is probably black nightshade. The fruit of this plant is a small black berry containing six or eight seeds, and these fruit are readily eaten by many types of birds and animals. Plants are to be seen in abundance in favoured spots such as damp depressions or along watercourses far to the east of Kalgoorlie and in similar areas in otherwise most inhospitable country.

Swamp Plants
As compared with these special adaptations, certain types of plants are effectively distributed without having any particular modifications. These are the swamp or marsh plants, most of which produce very small or light seeds. The agents of dispersal are aquatic birds which nest and feed near water, and which are capable of carrying mud and seeds on their feet from one swamp to another. Loop grass, typha, and many species of sedge have undoubtedly been spread, at least to a certain extent, by this means. It is possible too that birds have been responsible for the introduction of the recently recorded grass *Crypsis niliaca* in the swamps of the Coolup area.

These are but a few of the many aspects of seed dispersal which contribute to the importance of certain plants as weeds. I hope that these thoughts will also lend emphasis to the oft-repeated statement that one of the first principles in preventing the spread of weeds is to prevent the formation of flowers and seeds on established plants.

### MOLYBDENUM DEFICIENCY ON LIGHTER SOILS

By E. N. FITZPATRICK, Research Officer, Plant Research Division

WIDESPREAD occurrences of molybdenum deficiency of subterranean clover have been observed on sandy and gravelly surfaced soils in recent years, and present indications are that molybdenum will join copper and zinc as a major trace element deficiency of many of these soils.

Until molybdenum deficiency was observed on a gravelly soil at Mt. Barker in 1958, it was thought that it was restricted to the red brown and brown soils derived from granites, schists and gneisses in the Bridgetown, Nannup, Donnybrook and Balingup Districts, and along the Darling Scarp.

Today we know that it is very much more widespread.

Districts Affected
Thousands of acres of molybdenum deficient clover have been observed in the West Kojonup, West Arthur, Upper Blackwood, Cranbrook and Plantagenet Shire Council districts.

This deficiency is causing very serious losses in pasture production, particularly winter production, on sandy and gravelly surfaced soils which often overlie a red or yellow grey mottled friable clay and carry redgum and whitegum, or redgum and jarrah, in the virgin state.

Also, since molybdenum is necessary in the process of nitrogen fixation by the bacteria associated with the plant roots the rate of fertility build-up under leguminous pastures is slowed down, or even stopped. In the districts mentioned the deficiency is so widespread that all new pastures sown down should receive molybdenum as well as copper and zinc.

At present we do not know how extensive this problem is, but deficient areas have also been observed as far north as the Williams district, and as far east as Hope-town and the Esperance Downs Research