

THE CONTROL OF ONION WEED BY COMPETING PASTURE PLANTS

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Field experiments at the Waite Institute (red brown earth 24.7" rainfall) and at Avon, (a mallee environment 15" rainfall) have been in progress since 1952. In each instance 5 pasture mixtures or species (including volunteer pasture) at 5 levels of nitrogen supply have been studied in relation to the density and growth of the onion weed (Asphodelus fistulosus). Striking differences in onion weed population have developed. Where a vigorous growth of a perennial species, either grass or legume, has occurred, there has almost been an elimination of onion weed; where the perennial species was weak (e.g. perennial ryegrass at the Waite Institute) only partial control was achieved. Annual species such as Wimmera ryegrass or volunteer annuals have been ineffective in the control of onion weed. Table 1 shows the influence of the various pasture mixtures in the third year of the experiments.

Table 1 - Density of Onion Weed.

May 1954.

(i) At Avon

No. of Onion Weed Plants	Volunteer Pasture	Wimmera ryegrass	Perennial Veldt Grass	Lucerne	∅ Pasture Mixture
Perennating ★ Plants	143.0	96.9	51.0	2.0	17.5
Seedlings /	82.2	51.3	52.7	13.1	10.4

★ Plants per 1/200 acre surviving from 1953

/ Seedlings per 40 cores of 2 $\frac{1}{8}$ " diam.

∅ Comprising perennial veldt grass, barrel medic, Wimmera ryegrass and lucerne.

(ii) At the Waite Institute, Adelaide

No. of Onion Weed Plants	Volunteer Pasture	Wimmera ryegrass	Perennial ryegrass	Phalaris	Pasture ∅ Mixture
Perennating ★ Plants	145.9	129.5	62.8	5.9	6.3
Seedlings /	203.6	268.0	56.2	20.8	7.2

★ Plants per 1/2 acre surviving from 1953

/ Seedlings per 40 cores of 2 $\frac{1}{8}$ " diam.

∅ Comprising Phalaris, Subterranean clover, Wimmera ryegrass and lucerne.

At Avon lucerne has been notably successful. In the mixed pasture the effectiveness of the lucerne is curtailed by the competition of the other pasture components. Perennial veldt grass, though giving only a partial reduction of population, caused a considerable reduction also in plant size.

At Adelaide, Phalaris either alone or in a mixture has been notably effective at all levels of nitrogen supply. Lucerne established poorly in the mixed pasture. It is of considerable interest that the effectiveness of perennial ryegrass was greatly enhanced by improved nitrogen status. The onion weed populations at increasing levels of nitrogen were 102, 81, 77, 38 and 15 plants per 1/200 acre. Even such a weak competitor as Wimmera ryegrass showed reduction of onion weed from 146 to 63 plants as nitrogen level was increased.

Thus, in summary, it is clear that vigorous perennial plants will largely suppress onion weed. If the competing plant is of weak or moderate effectiveness, its control of onion weed is greatly enhanced by stimulation of vigour through improved nitrogen status. Grazing was light at both centres; the commercial use of competing plants will depend on management designed to maintain the perennial species.