

COMPETITION BETWEEN WHEAT AND WILD OATS

O. Cartledge*, B.J. Wilson, B.J. Radford,
F.B. Watkins and S.R. Walsh
Department of Primary Industries, Queensland

A single value for the economic threshold level of wild oats (i.e. the wild oat density above which significant yield losses occur) is often sought. A single value would be very useful to farmers and extension workers, but might be very misleading. The competitive damage done by wild oats will be affected by such factors as sowing rate, soil type, soil moisture, and soil fertility (in general, crop density and vigour) as well as the phenological stage of the crop at which wild oats emerge.

In seven seasons since 1962, wheat/wild oat competition has been studied on the Darling Downs black earths, using an additive experimental design. An additive design is characterized by one species, the indicator or crop species being sown at the same density, whether in monoculture or in mixture. Mixtures are produced experimentally by the addition of plants of other species to stands of the indicator (Trenbath and Harper 1973).

The wild oat density that significantly reduced wheat dry weight or yield varied from 11 to 153 per m². There was a general tendency for this value to increase at high planting rates, thus indicating the competitive advantage that a dense crop has. These data do not take account of the time of emergence of wild oats in relation to crop emergence.

The values determined for the economic threshold level of wild oats on the deep black soils of the Darling Downs are generally higher than figures often presented for the grain belt in southern Australia. It may be that wheat and wild oats co-exist differently in the different soils of the Queensland cereal belt.

The relationship between wheat sowing rate and yield was documented for a wide range of seasonal conditions by Colwell (1963) and Fawcett (1964). They indicated that varying the seeding rate from 11-66 kg/ha had negligible effect on grain yield but when soil moisture was limited yield was reduced at higher sowing rates. The effect of weed competition on this relationship is not yet known. Our results

* Present address - Canberra College of Advanced Education