

Weed response to crop stubbles

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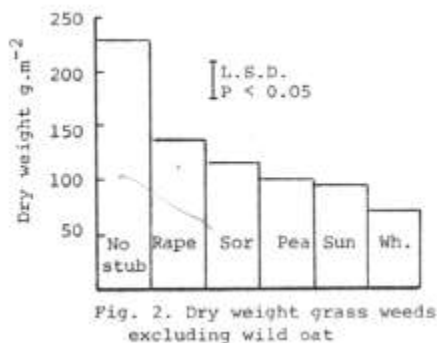
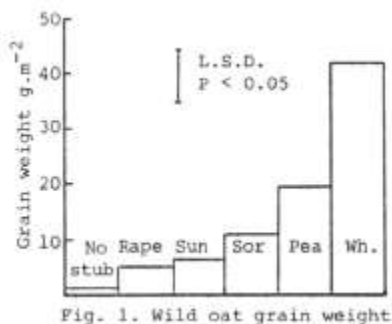
Studies have shown that the effect of crop stubbles on weed germination and growth can vary from inhibition, through no effect, to stimulation (1,2). The response is largely dependent on stubble type and quantity (or extract concentration where water extracts are used to eliminate physical influences), and the weed species tested.

Methods

A field study was conducted at the Laureldale Research Station, Armidale, to investigate the influence of stubble type on weed flora in the absence of a growing crop. No herbicide, pesticide or fertilizer was applied. All existing weed growth was removed by cultivation. Stubble residues from mature, harvested crops of sorghum, sunflower, rape, wheat and pea were applied at the rate of 5 t ha⁻¹ in a randomized block design with four replications. Control plots contained no stubble. In addition to the naturally-occurring weeds known to be present at the site, wild oats (*Avena fatua* L. and *Avena ludoviciana* Dur.) were seeded at 125 kg ha⁻¹.

Results and Discussion

Very few wild oats germinated in 'no stubble' plots in comparison to stubble plots. Of the stubbles tested, wheat stubble proved most stimulatory to wild oat germination and growth, producing a very vigorous stand. The oven-dry weight of wild oat seed, produced by the plants growing on the different stubble types, is shown in Fig. 1. Conversely, the germination and growth of other grassy weed species was inhibited by all crop stubbles in comparison to 'no stubble'. Dry matter data are presented in Fig. 2. Numbers and dry matter production of broadleaved species were reduced under wheat and pea stubbles with respect to other crop stubbles and 'no stubble' (data not shown).



Continuous monoculture can selectively promote certain weed species which, once associated with a particular crop, become increasingly difficult and more expensive to control. Of particular interest is the almost universal occurrence of wild oats in cereal crops. It is possible that biochemical influences are part of the complex of factors involved in such associations.

1. Leather, G.R. 1983. Weed Science, 31:37-42.

2. Putnam, A.R., and DeFrank, J. 1979. Proc. IX Inter. Cong. Plant Prot. pp.580-582.

