

# EFFECT OF CULTURAL TREATMENTS ON WILD RADISH DENSITY IN WHEAT

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*Abstract.* Wild radish (*Raphanus raphanistrum*) is a troublesome weed of cereal crops in southern Australia. It can severely reduce grain yield and also contaminate the harvested grain. Wild radish seed buried at 10 cm depth does not germinate as readily as seed near the soil surface, but it remains viable for a longer period (Piggin *et al.* 1978). Preliminary work at Rutherglen in north-eastern Victoria showed that the density of radish can be greatly reduced following deep burial of the seed by mouldboard ploughing.

To investigate the effect of various cultural treatments on the density of wild radish in the following wheat crop, trials were established at two sites in the Rutherglen area in 1979. The treatments were scarifying to a depth of 7 cm, mouldboard ploughing to 15 cm, and direct drilling of the crop following no previous cultivation or following a shallow cultivation to about 3 cm. The crop was sown in the second and third week of June.

The number of wild radish seedling  $m^{-2}$  emerging in the crop was measured just prior to an early post-emergence application of herbicide to control the wild radish (July 24) and again just prior to the application of 2,4-D to control late germinating seedlings (September 18). At both times of assessment the mouldboard ploughed plots had less wild radish than the other treatments, whilst the density was greatest on the direct drilled plots (Table 1). Where direct drilling followed shallow cultivation, seedling emergence was similar to that on the conventionally scarified plots.

Table 1. Effect of cultural treatments on the density of wild radish in the following wheat crop.

Treatment	Wild radish seedlings (no. $m^{-2}$ )			
	Site 1		Site 2	
	July 24	Sep. 18	July 24	Sep. 18
Scarified 7 cm	119 b <sup>1</sup>	13 b	39 b	7 a
Mouldboard ploughed 15 cm	41 a	3 a	14 a	1 a
Direct drilled	202 c	25 c	106 b	20 a
Scarified 3 cm + direct drilled	97 b	17 bc	32 b	6 a

<sup>1</sup> Values followed by different letters are significantly different ( $P=0.05$ ) as determined by Duncan's Multiple Range Test on  $\ln x$  or  $\ln(x+1)$  transformed data (comparisons within columns only).

Because of the high germination where the crop was direct drilled and the more rapid loss of viability of seed near the surface, successive cropping using direct drilling methods should result in a marked reduction in the number of viable seed in the soil, particularly if further seed production is prevented by the use of herbicides. This aspect is currently being investigated.

Although deep burial of the seed by mouldboard ploughing considerably reduced the density of wild radish, sufficient plants emerged to require the application of herbicide to prevent crop yield reduction. It has been shown at Rutherglen that densities of wild radish as low as 10 plants  $m^{-2}$  will reduce the yield of wheat by about 20% (unpublished data). Because deeply buried seed retain their viability for a considerable period, cultivation for subsequent crops must not be deep enough to return these seeds to the surface. Direct drilling of succeeding crops may overcome this problem. This technique is also being investigated.

Piggin, C.M., T.G. Reeves, H.D. Brooke and G.R. Code. 1978.  
Proc. of the First Conf. of the Council of Aust. Weed Sci. Soc.,  
Melbourne. p 233-240.