## Suppression of Iolium rigidum in wheat by cultural means

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Agronomy "packages" for broadacre wheat production are mostly derived from experiments done under weed-free conditions. Yet cultural operations which give maximal grain yield may not necessarily be optimal under weedy conditions. The experiments reported compared wheat grain yields when *L. rigidum* was grown with wheat sown in varying densities and spatial arrangements.

## Methods

Four field experiments located near Manildra N.S.W. were conducted over the climatically contrasting seasons 1978 to 1980. Wheat cv. Condor was sown in poisson (traditional), precisely square and rectangular<sub>2</sub>arrangements using drilled boards at densities of 40, 74 and 200 plants m . *L. rigidum* was oversown into the top 40 mm of plots to give populations of from zero to 300 plants m Data presented here are for wheat grain yields.

## **Results and Discussion**

Mean weed-free wheat grain yields varied between years from 1.3 to 5.4 t ha<sup>-1</sup> but the proportional effects of *L. rigidum* competition were similar across experiments. The results from each experiment have been combined as given in Table 1.

## Table 1. Effect of *L. rigidum* on wheat grain yield: figures are means across experiments of grin yield as percent of highest yielding treatment within each experiment (- SE of mean).

Wheat density (plants m <sup>-2</sup> )	L. rigidum density (plants m <sup>-2</sup> )	Sowing Arrangement		
		Square	Rectangular <sup>1</sup>	Poisson
40 and 74	0 50 to 100 101 to 300	$\begin{array}{r} 89 \\ + \\ 60 \\ + \\ 41 \\ - \\ 7.8 \end{array}$	75 + 8.2 58 + 9.9 40 - 9.2	$\begin{array}{r} 92 \\ 40 \\ 28 \\ 28 \\ -2.7 \end{array} + \begin{array}{r} 4.8 \\ 3.6 \\ 2.7 \end{array}$
200 "	0 50 to 100 101 to 300	$ \begin{array}{c} 86 \\ 73 \\ 72 \\ 72 \\ 5.9 \end{array} $	$90 \pm 5.9$ 77 $\pm 16.7$ 57 $\pm 5.5$	87 + 17.4 77 + 16.3 67 + 11.9

1 Ratio of between plant to between row distances of 1:6.4

As the density of *L. rigidum* increased, wheat grain yields in low density crops decreased to a similar extent in square and rectangular arrangements. The depression of wheat yields was significantly greater in the poisson arrangement.

Wheat grain yield in crops at 200 plants m<sup>-2</sup> was less affected by L. rigidum and grain yield was significantly reduced only by 101 to 300 plants m in the rectangular arrangement.

The highest wheat density tested also greatly reduced the mean plant weight of *L*. rigidum (1). It therefore seems advisable to increase crop density, rather than vary arrangement, to reduce the competitive effects of *L*. rigidum.

1. Medd, R.W, Auld, B.A. and Kemp D.R. 1981. Proc. 6th Aust. Weeds Conf. 1:39-43.