

DYNAMICS OF WEED SEEDLING EMERGENCE IN WHEAT GROWING SOILS

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Abstract. The aim of the experiments is to measure the effect of field factors on weed seedling emergence and the decline of soil seed populations with time, in situations with no fresh seed added. This is being done using 240 mm diameter plastic pots set in the ground with plastic mesh across the top, and mesh in the soil in the pots to mark seed location. The mesh on top holds stubble in place and prevents soil disturbance (e.g. by birds). Field trials are in progress with zero, tyne and sweep cultivation treatments. Some results are presented elsewhere in these proceedings (Medd and Wilson 1984).

The effect of soil disturbance, seed depth (1 to 2 cm vs. 7 to 8 cm) and stubble (3 t ha⁻¹) on paradoxa grass (*Phalaris paradoxa*) and wireweed (*Polygonum aviculare*) was measured in in-ground pot experiments. Emergence of wireweed from the 7 to 8 cm depth was much less than from 1 to 2 cm, whereas for paradoxa grass depth of the seeds in the soil had little effect on emergence. The effects of soil disturbance and stubble were not consistent. Duplicate experiments were commenced in 1979 and in 1980. Emergence in the first year was higher in the experiment started in 1980 indicating a year effect.

The emergence of ten weed species, black bindweed (or climbing buckwheat) (*Polygonum convolvulus*), wireweed, turnip weed (*Rapistrum rugosum*), Indian hedge mustard (*Sisymbrium orientale*), London rocket (*S. irio*), New Zealand spinach (*Tetragonia tetragonoides*), paradoxa grass, wild oats (*Avena fatua*), mintweed (*Salvia reflexa*) and urochloa grass (*Urochloa panicoides*), was measured in in-ground pot experiments. Seed of all species was distributed in the 0 to 8 cm layer and is disturbed four times per year. Emergence in the first year (1979) ranged from 5 to 40% and in the first year of the duplicate experiment (1980) ranged from 8 to 70%. Emergence declined in the second and third years except for that of London rocket, New Zealand spinach and mintweed, where emergence was highest in the second year in one of the duplicate experiments. Emergence of New Zealand spinach in the fourth year was higher (at 4%) than for all other species (<1%); this result was confirmed in the field trials.

At two sites, weeds were allowed to produce seed for one year before the field experiments were established. At Mt. Emlyn, there was no effect of the cultivation treatments whereas at Westbrook there was (Table 1).

Although the difference between the uncultivated and cultivated treatments was not significant for black bindweed in 1981 and 1982, it was significant for the total of the two years.

For the other three species, the effect of cultivation was not consistent; it varied between years, from no effect to reduced emergence in the uncultivated treatment (or alternatively, increased emergence in the cultivated treatments). The change in treatment effects between years may be a year effect, or may be due to emergence being from increasingly older seed, or a combination of both factors.

TABLE 1: Weed emergence in a continuous fallow with no seed production after 1980, Westbrook, Darling Downs.

Weed species	Year	Seedlings (No. m ⁻²)			
		Cultivation			LSD (P=0.05)
		None	Sweep	Tyne	
Black bindweed	1981	56	130	112	N.S.
	1982	24	45	51	N.S.
	1983	3	5	7	1.8
Paradoxa grass	1981	112	370	314	130
	1982	12	11	9	N.S.
	1983	25	11	11	9
Mintweed	1981-82	1283	1023	1000	N.S.
	1982-83	131	182	272	85
	1983-84	11	35	35	9
Turnip weed	1981	123	112	113	N.S.
	1982	22	27	26	N.S.
	1983	5	23	25	6

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LITERATURE CITED

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