

Implication of *Pratylenchus Thornei* in wheat yield decline in Northern New South Wales.

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Farmers have for some time reported low wheat yields but satisfactory barley yields in sections of the Liverpool Plains, near Gunnedah, northern N.S.W. The problem occurs on fields farmed for many years, but not on adjacent newer farming country. Examination of plants had not indicated leaf or root rot diseases to be a problem.

A fertilizer experiment in 1978 indicated little or no yield response in wheat to nitrogen, phosphorus, potassium, copper, magnesium, molybdenum, or boron and a marginal response to zinc. The mean yield in the experiment was 1.8 t ha⁻¹, whilst the yield of surrounding barley was 3.7 t ha⁻¹.

In 1979, fumigation of the soil with methyl bromide (800 kg ha⁻¹) increased Clipper barley yield by only 16 percent but increased Timgalen wheat yield by 78 percent to equal the yield of Clipper (Table 1). Counts of root lesion nematodes (*Pratylenchus thornei*) in soil around surface roots at harvest suggested that the disorder was similar to one reported in the Darling Downs area of Queensland (1).

Table 1. Effect of methyl bromide on the grain yield of wheat and barley at Gunnedah.

	Fumigation	Grain Yield t ha ⁻¹	<i>P. thornei</i> per 500g soil
Wheat	-	1.65	8,300
Wheat	MeBr	2.94	0
Barley	-	2.54	2,700
Barley	MeBr	2.94	30

Two experiments in 1980 and three in 1981 also indicated improvement wheat growth and yield associated with methyl bromide application where *P. thornei* was present. Ethylene dibromide at 3.7 and 7.4 L ha⁻¹ in 1980 (and 10.8 L ha⁻¹ in 1981) and Counter? (terbufos) at 4 and 8 kg ha⁻¹ had no effect on wheat growth or yield, and had no consistent effect on *P. thornei* numbers in wheat roots sampled nine weeks after sowing in the 1981 experiments.

Thompson (1 and pers. comm.) recorded improved wheat yields in the presence of *P. thornei* using 4 kg ai ha⁻¹ aldicarb with the seed. We used aldicarb at only 0.4 kg ai ha⁻¹ with no effect on yield or nematode numbers.

High *P. thornei* numbers (up to 1500 per 500 g soil) have been recorded at depth to 60 cm both in fallow and under crop, with smaller numbers to 90 cm. Experiments in 1982 were not sown due to drought, but they did indicate that methyl bromide completely controlled *P. thornei* to 45 cm in a heavy clay and to 90 cm in a clay loam soil.

P. thornei has not been proven as the cause of this wheat yield decline, but is strongly implicated. Similar problems have also been reported in the Mudgee and Leadville area, indicating a need to determine the extent of the problem.

1. Thompson, J. P., MacKenzie, J. and McCulloch, J. S. (1980). Proc. Aust. Agron. Conf. Lawes. p. 194.