TABLE

Average	Average Yield Response - bus/ac (kg/ha						
	Barban oz a.i. per ac* (kg a.i. per ha)			Di-allate oz a.i. per ac (kg a.i. per ha)			
	2.5 (0.17)	5.0 (0.35)	10.0 (0.70)	8.0 (0.56) j.b.s.	16.0 (1.12) j.b.s.	8.0 (0.56) j.a.s.	16.0 (1.12) j.a.s.
Northern (4 sites)	5.1 (3.4)	1.3 (0.35)	-2.1 (1.4)	7.1 (4.8)	7.1 (4.8)	3.9 (2.6)	6.4 (4.3)
Wimmera (2 sites)	4.3 (2.9)	-1.0 (-0.7)	-3.0 (2.0)	7.6 (5.1)	7.6 (5.1)	5.7 (3.8)	9.2 (6.2)

j.b.s. = just before sowing
j.a.s. = just after sowing
* Applied at wheat 2-2½ leaf stage

Better yield improvement due to control of wild oats was obtained with di-allate, and the highest economic return was obtained from 8 oz a.i. per acre (0.56 kg a.i. per hectare) of this material applied just before sowing. The most effective barban treatment was 2.5 oz a.i. per acre (0.17 kg a.i. per hectare). The commercial recommended rate of 5 oz a.i. per acre (0.35 kg a.i. per hectare) of barban was not a payable proposition.

In nearly all experiments, di-allate at 8 oz a.i. per acre (0.56 kg a.i. per hectare) gave an economic response, but only in 7 out of 12 did barban 2.5 oz a.i. per acre (0.17 kg a.i. per hectare) prove profitable.

THE WILD OAT PROBLEM IN NEW ZEALAND

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Both *Avena fatua* L. and *A. persica* Steud.)syn. *A. ludoviciana* Dur.) are present in New Zealand and referred to collectively by the standard common name 'wild oat' though *A. persica*, first collected in 1963, is found in quantity only in a part of the Ellesmere County of Canterbury. Wild oats are important as a weed in North Otago, Canterbury and Marlborough where they are usually present on farms or in districts with a history of intensive cash cropping and absent or nearly so where cash cropping is secondary to animal production and part of a rotation including green feed crops. The area, annually, in cereals, peas, ryegrass for seed and white clover for seed which contains wild oats is estimated at under 100,000 acres (40,000 ha) with less than 2000 acres (800 ha) sufficiently heavily infested to jeopardize harvest. The significance of the balance of the area depends on the proportion at or above a density at which the value of any benefit equals the cost of control. Quality, is at present, not important in this respect as grain containing wild oats is saleable provided it meets normal trade purity requirements. Yield response is thus the determining criterion. Trials with barban indicate a threshold density for yield response of about 30 per yd^2 (35 per m^2) at the time of treatment in wheat and barley and 15 per yd^2 (18 per m^2) in garden peas, leading to an estimate of an additional 5,000 acres (2000 ha) warranting treatment.

Barban has been used for control commercially for some years while tri-allate and trifluralin have become freely available in the last 12 months. Since 1967 the Department of Agriculture has been comparing barban with alternative chemicals in barley, wheat, and garden peas.

Results indicate the value of early removal of competition. Pre-plant soil incorporated (PrePSI) treatments (tri-allate in cereals and peas, trifluralin in peas) have yielded significantly better than not-treated more frequently than have post-emergent treatments made at the 1-to 3-leaf stage of wild oats, while good control by WL 17,731 (ethyl 2-(N-benzoyl-3, 4-dichloroamilino) propionate) at the 3-to 5-leaf stage gave no yield response.

B5710 (methyl 3-(4 chlorophenyl-2-chloro) propionate) and WL 17,731 are promising post-emergence chemicals. B5710 applied at 3.75 lb per ac (4.2 kg per hectare) at the 1-to 3-leaf stage has given similar control and yield responses to barban in wheat and barley, supporting Holroyd's (1968) results. WL 17,731 at 2.0 lb per ac (2.24 kg per hectare) gave better control at the 3-to 5-leaf stage than at the 1-to3-leaf stage. Wheat was tolerant at both times but barley was severely stunted at the later time of treatment. MSMA post-emergence in barley and haloxydine post-emergence in wheat and barley have not proved sufficiently selective to warrant further evaluation.

In peas, control with tri-allate and trifluralin has been similar at equal rates of active ingredient while increasing barban from 5 oz to 10 oz per ac (0.35 to 0.7 kg per hectare) improved wild oat control but gave no further increase in yield.

No treatment eliminated seeding though B5710 at 6.0 lb per ac (6.7 kg per hectare) and WL 17,731 at 4.0 lb per ac (4.48 kg per hectare) came very close to this objective.

With control measures available for field crops, other than ryegrass seed, it seems unnecessary to treat populations unlikely to affect yield or to penalize produce from infested fields unless this offers definite prospect of preventing spread to clean land or of eradication. The implication is that our future work should be directed to determining the feasibility of eradication within acceptable cropping systems and to delimiting the variables associated with yield response from wild oat control (vide Paterson 1969). However, if cost of treatment could be reduced such decision oriented data would not be wanted since the farmer would adopt routine 'crop insurance' weed control. Broad spectrum single application treatments (and, in New Zealand, subsidies) are a step in this direction.

WIMMERA RYEGRASS AS A WEED IN CEREALS

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Wimmera ryegrass (*Lolium rigidum*) has been recommended and has flourished as a pasture species throughout the cereal-growing areas for many years in Western Australia. Its ability to survive under a wide range of conditions has demonstrated that it possesses many of the characteristics that enable weeds to persist and compete strongly with pasture species and cereals. Under conditions of moisture stress, Wimmera ryegrass loses some of its ability to reduce cereal yields, and this is probably due to the wheat plants' drought resistance.

In 1969 at Merredin, where only 520 points of rain fell during the growing season, 26 plants of Wimmera ryegrass per sq yard reduced the crop yield from 20.6 to 15.5 bus. per acre. Under normal conditions the reduction would have been greater. Because of the variation that occurs it is undesirable to try and relate the reduction in yield likely to occur with the presence of a certain number of ryegrass plants. Variation occurs not only from year to year, but also from one site to another.

The development of the seed, its maturation, and germination pattern, play an important part in the persistence of Wimmera ryegrass as a weed. Immediately after seed formation, the