2,4-D ester broken down within a few weeks; however, although a paraquat/2,4-D ester mixture has minimal soil activity, this is not a disadvantage if weed germination is reduced by not disturbing the soil. The use of a suitable, more prolonged residual herbicide may reduce spraying to one application in a wholly retained stubble but there is a danger of phytotoxicty to the following crop and build-up of residues in the soil.

PRACTICAL PROBLEMS

Stubble must be removed in order to sow with existing equipment. However, a triple disc drill being used in our trials is capable of directly drilling wheat into standing stubble. Although stubble need not be removed, undisturbed soil may cap, and prevent water penetration even under stubble. Hence red-brown earths may need cultivation while black soils, which crack when dry, are likely to benefit from minimum soil disturbance and give better wheat establishment.

Adopting a chemical fallowing system involves high chemical costs but machinery, labour, and contouring costs may be saved and the technique can reduce soil erosion and cultivation; as well, spraying effectively controls weeds in retained stubble giving additional moisture accumulation for the following wheat crop.

ALACHLOR - A NEW PRE-EMERGENCE HERBICIDE FOR *LOLIUM RIGIDUM* CONTROL IN CEREALS

J.M. Allen
Monsanto Australia, Western Australia

INTRODUCTION

Pre-emergence control of weeds in cereals with a surface-applied chemical treatment is impossible at the present time. A chemical that can be applised in this manner would extend the use of pre-emergence herbicides to aerial application and to application on wet or poorly textured soils not suited to

incorporation.

The need to meet these requirements is probably more pronounced for *Lolium rigidum* than for any other weed in cereal crops.

Alachlor has shown promise in selectively controlling *L. rigidum* in wheat and barley when applied to the surface after seeding.

PERFORMANCE

Evaluations prior to 1969 had shown that the performance of Alachlor is directly proportional to the quantity and timing of the first rainfall. Northern New South Wales and Queensland were therefore excluded from the major testing programme in 1969. The chemical was evaluated at from 0.5 lb a.i. per acre (0.56 kg per hectare) to 2 lb a.i. per acre (2.24 kg per hectare) applied after seeding. At most sites surface application of alachlor was compared with a soil-incorporated treatment. Alachlor at 1 lb a.i. per acre (1.12 kg per hectare) applied to the surface gave good *L. rigidum* control. At 0.5 lb a.i. (0.56 kg per hectare) promising results were obtained on sandy soils.

Alachlor activity is reduced by high (more than 5%) organic matter content.

Promising results were also obtained where the herbicide was applied by air at the higher rate to heavy soils. Unacceptable *L rigidum* control (50-75%) resulted where extremely dry conditions followed application. The direct relationship of alachlor effectiveness on *L.rigidum* and rainfall in the 2 weeks following application was very apparent in the widespread drought experienced in Western Australia. Results varied from 50% control in dry conditions to over 90% control where adequate rain was recorded. Activation and movement into the soil requires a minimum of 30 points (0.762 cm) of rain within 14 days of application. Where application is onto a dry surface 50 points (1.27 cm) is required within 14 days. Where sufficient rain was not received a shallow soil incorporation proved to be superior. Deep incorporation will not give satisfactory results.

CROP SELECTIVITY

Crop selectivity has generally been good at 1 lb a.i. per acre (1.12 kg per hectare). Occasional slight damage has resulted from 2 lb a.i. per acre (2.24 kg per hectare). Crop injury may occur where shallow seeding is practised in high-rainfall areas.

SUMMARY

Alachlor has shown promise in controlling *L. rigidum* in cereals when applied to the surface after seeding. Consistent results can only be expected in areas where long-term meteorological records show there is a high probability of adequate rainfall in the early post-seeding period. Soil incorporation of alachlor is likely to extend the areas of possible useage into the lower-rainfall regions.

DOES KARMEX(R) HAVE A PLACE AS A SELECTIVE POST-EMERGENT ANNUAL WIMMERA RYEGRASS HERBICIDE IN WHEAT IN SOUTH AUSTRALIA

G.B. Baldwin
Department of Agriculture, South Australia

During 1968 diuron (3-3,4 dichlorophenyl)-1, 1-dimethylurea) was applied as an early post-emergent spray treatment to wheat, for the control of seedling annual Wimmera ryegrass (*Lolium rigidum*, Gaudin). Treatment of the crop (*Triticum aestivum* L., var. Insignia) using a Chesterford mini-logarithmic experimental sprayer took place one month after sowing.

Visual assessments indicated that:

(1) Complete control of annual Wimmera ryegrass was achieved at rates of diuron in excess of 1.44 lb active/acre (1.61 kg/ha).

(2) Heavy suppression (estimated 80% reduction in oven dry weight) was achieved at rates in excess of 0.81 lb active/acre (0.91 kg/ha).

(3) Although transient yellowing of the crop took place, there was no apparent visual damage remaining some 4-5 weeks after treatment.

Sedgley and Boersma (1969) reported that the rate of photosynthesis in wheat plants declined for at least 5-6 days after