

THE USE OF CHEMICALS IN A SUMMER FALLOW SYSTEM

A.R. Badley

ICIANZ North West Wheat Research Institute, New South Wales

W.C. Stonebridge

ICIANZ 'Merrindale' Research Station, Victoria

STUBBLE RETENTION

The northern New South Wales wheat belt receives the bulk of its annual rainfall during the summer fallow, and fallow moisture conservation is important for the following crop. Current fallow practices of burning or ploughing to remove stubble and cultivation for subsequent weed control leave soil exposed to heavy raindrop action and high temperatures occurring from December to February. Retaining a stubble cover can prevent moisture losses caused by run off in sloping country and by evaporation. The efficiency of a stubble cover depends upon the amount and form in which it is retained.

Fawcett (pers. comm.) showed that stubble retention can, in some situations, increase both fallow moisture accumulation and subsequent wheat yields in the region.

WEED CONTROL

Fallow weed growth causes further moisture losses. Where stubble is retained, chemical weed control is more effective than cultivation; also, by disturbing soil, cultivation encourages further germinations of summer weeds and wild oats (*Avena ludoviciana*). In our trials weeds were controlled in undisturbed stubble until sowing by two spray applications, one after harvest in December, the other in February. A spray-tank mixture of paraquat (3 oz a.i. per acre, or 210 gramme per hectare) and 2,4-D ester (24 oz a.i. per acre, or 1,662 ~~gms~~ gramme per hectare). On a conventional stubble-free area five cultivations were required. Although wild oat incidence was reduced by 75% in the absence of cultivation, an additional application of 2 oz paraquat was needed to kill wild oats before sowing. Alternatively, fallow weeds were controlled by one spray application in stubble retained until February, and thereafter by cultivation.

The rapid herbicidal activity of paraquat is an advantage where young summer weeds are growing away vigorously; adding 2,4-D ester enables a wider range of broadleaved weeds to be controlled. Paraquat is inactivated on contact with soil and

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 phytotoxicity 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 applied 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