Research Note

THE INTERIM EVALUATION OF THE HERBICIDES CHLORTOLURON AND BROMOFENOXIM FOR WEED CONTROL IN WHEAT AND BARLEY IN THE SOUTH ISLAND

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Summary

Chlortoluron and bromofenoxim are very selective herbicides for post-emergence application to wheat and barley. This research note summarizes results from eight trials, conducted in two climatic regions over the 1971 and 1972 cereal seasons. Activity on a wide range of weeds occurring in the South Island is discussed and yield figures cited. No attempt is made to draw any definite conclusions from the data available at this early stage in the evaluation of these herbicides.

INTRODUCTION

THE WEED SPECIES, willow weed (*Polygonum persicaria*), cornbind (*P. convolvulus*), wireweed (*P. aviculare*) and spurrey (*Spergula arvensis*), have established themselves as problem weeds in wheat and barley in the South Island. Californian thistle (*Cirsium arvense*) and fathen (*Chenopodium album* agg.) are still major weeds in cereals but their control is established and remains effective.

With the advent of larger acreages of wheat and barley in Southland, the problem weeds mentioned have become accentuated in this area because of climatic factors. The weed pressure on the crop was severe in Southland as both the 1971 and 1972 seasons were damp and warm. Climatic conditions in Canterbury—usually dry in the summer—were exceptionally so in both years, this drought adversely affecting yield but making weed control relatively simple.

The herbicides were evaluated on five typical Southland sites, and three in Canterbury.

Lesser weeds occurring on the trial sites were: Chickweed (*Stellaria media*), speedwell (*Veronica* spp.), fumitory (*Fumaria officinalis*), vetch (*Vicia* spp.), and in one Southland trial a moderate infestation of cleavers (*Galium aparine*).

EXPERIMENTAL

The 8 trials were of randomized block design, containing 6 replications of each treatment. The chemicals were applied by a Drake and Fletcher mistifier unit delivering 337 l/ha at 2.11 kg/cm^2 as an overall spray. All assessment ratings were based on a 1 to 9 scale—favourable results being the higher figure. References to yield are on mean replicate figures only and have not been statistically analysed.

RESULTS AND DISCUSSION

Bromofenoxim was applied at 1.1 kg and 2.3 kg/ha. The chemical had a desiccation effect on all species of weeds, this effect being clearly visible 12 hours following application. The wheat and barley, at 4-leaf stage, were not affected at either rate. In the dry conditions experienced in Canterbury in both seasons, this immediate effect was both impressive and long-lasting—the plots remaining at a satisfactory level of weed control until harvest.

The Southland trials produced a similar initial effect with an excellent desiccation of weeds, including willow weed and cornbind at the 4-leaf stage in two trials. Weather conditions following application were warm with ample rainfall, ideal for a second germination of weeds if the chemical used was not residual. Bromofenoxim showed no residual effect under these conditions and at 4 weeks post-treatment all plots were re-infested with chickweed and spurrey. The cornbind and willow weed did not reappear.

Chlortoluron was applied at 3.4 kg and 1.7 kg/ha. In Canterbury and Southland weed control results were identical. At 3.4 kg chlortoluron controlled all weeds present and plots remained clean until harvest. Ratings on these plots gave a weed control efficiency of 95 to 100%. At 1.7 kg control of willow weed, cornbind, and cleavers was marginal. Californian thistle was not controlled by either chemical.

Chlortoluron was applied in combination with terbutryn at three rates. Chlortoluron 1.7 kg + terbutryn 0.3 kg gave acceptable control of all species, including the polygonums, but did not reach the standard of luxury control achieved by chlortoluron 3.4 kg applied alone. Chlortoluron 0.8 kg + terbutryn 0.1 kg was not active enough on the polygonums, but gave effective control of fathen, spurrey and fumitory. The higher rate of chlortoluron 3.4 kg and terbutryn 0.6 kg caused severe chlorosis and plant stunting on barley, reducing yield by 50%. On wheat in both areas this effect was not visible, weed control was excellent, and yield not affected.

The further evaluation of these herbicides alone and in combinations is planned for the 1973 season.

CLOVER SEED CROP

CHAIRMAN'S SUMMARY

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The first paper demonstrates quite clearly that, at the rates used, carbetamide controlled grasses and increased white clover seed-heads in a similar manner to paraquat at the rate normally used for grass control in white clover seed crops. However, with only two replications at each site and no statistical analysis of the results, the authors are not justified in making recommendations as to the rate of carbetamide which is equivalent to paraquat at 0.3 kg/ha. Statistical analysis will indicate differences due to treatment rather than chance, and this is most important when trying to assess the effectiveness of various rates. The relatively large number of trial sites for which results were quoted is a point in favour of the work reported, as is the idea of getting farmers to apply and evaluate the chemicals under test.

In the paper by F. C. Allen *et al.*, line 4, page 218, should read "1.65 kg/ha of pronamide". Figure 1 is somewhat confused by the "untreated" parallel, horizontal lines in the middle, which presumably indicate the composition of the untreated sward. The most important aspect is the effect of time of spraying on the rate of carbetamide or pronamide necessary for adequate control. Spraying in July and August resulted in higher yields of white clover seed, and the results quoted (Tables 1 and 2) would almost certainly have been different if spraying had taken place in winter instead of September and October. The results also emphasize the importance of choosing the right chemical in relation to species and type of weed infestation. A member suggested the use of combinations of these chemicals, and the authors replied that this has not yet been tried. It was pointed out that with the necessary early (mid-winter/mid-spring) application of carbetamide and pronamide, more pasture production was lost than with the later applied paraquat. Some members felt the terms "control" and "suppression" were not used clearly and should be defined.

R. A. French gave a concise and logical review of the case-bearer situation. Control of this insect can be obtained with chemicals but only if they are properly used. However, it is alarming to hear that some damage to bee colonies can still occur. The author emphasizes that chemicals should only be applied if the estimated crop yield is high enough to more than offset the cost. The information that first-year crops seldom have a high level of infestation is a further indication that, for really high yields, white clover seed must be produced from first-year special-purpose pure swards. White clover seed produced after ryegrass in a mixed pasture frequently has a high level of case-bearer damage. This paper provides some clear guidelines for clover case-bearer control.