TOLERANCE OF BARLEY TO MCPA AND DICAMBA

F. C. ALLEN*

Canterbury (N.Z.) Seed Co. Ltd., Christchurch

Summary

The trials reported indicate less tolerance of the barley varieties Kenia and Cape than of Research or Carlsberg to mixtures of MCPA and dicamba. The selectivity of a mixture of 0.75 lb MCPA and 0.125 lb dicamba active ingredient per acre is marginal for Kenia and Cape.

INTRODUCTION

DURING the past two seasons dicamba has been available for weed control in cereals either as a tank mix with MCPA or as a ready formulated mixture with 2,4-D or MCPA. Because of their greater efficiency against polygonaceous weeds, these mixtures have gained ready acceptance and widespread use, especially in wheat. Early trials indicated that they could be used in Kenia, and Research barley, but reports from America (*e.g.*, Friesen *et al.*, 1963), indicated that damage leading to reduced yield could occur. Time of application in relation to plant development and rate of application were important in this respect, but varietal differences could also occur.

To gain information on these points, a number of trials were laid down in crops of the currently grown barley varieties comparing MCUA with a mixture of MCPA and dicamba. Normal and twice normal recommended dose rates were used at somewhat past optimum and at late times of application (see footnote Table 1). Twice normal rate of an experimental MCPA/2,3,6-TBA/dicamba mixture (210/1) was also included. (All rates given in active ingredient per acre.)

The crops were relatively weed-free, the fertility was good, and soil moisture satisfactory.

Owing to adverse weather, only a "late" spraying was carried out in Cape barley (a six row feed and green manure variety). The Research had to be hand-sampled because of lodging.

RESULTS

Following treatment, all varieties other than Swallow showed some reaction to the mixtures. At the 6½-leaf stage of treatment, bending (flattening) of the crop occurred. Later the plants were slightly shorter than unsprayed and developed a bluish tinge in the foliage. A varying proportion of the spikes were slow in emerging from the flag leaf sheath and developed trampled awns as a consequence. In the later treatments, the retention of the ear in the flag leaf sheath was more marked, resulting in a large difference in appearance between the mixture plots and the MCPA or untreated plots at the 50% ear emergence stage. At header ripe stage, the difference could not be detected in Carlsberg or Re-

* Now with Department of Agriculture, Christchurch.

TABLE 1: VISIBLE EFFECTS SCORE

Treatment (lb)	Kenia	Research	Barley Varieties Carlsberg	Swallow	Cape
MCPA 1.0	1.1	1.5	1.0	1.0	
MCPA 2.0	1.0	2.2	1.0	1.0	
MCPA 0.75/Dicamba 0.125	2.1	3.0	1.6	1.0	
MCPA 1.25/Dicamba 0.25	3.5	4.7	3.0	1.0	
210/1 Double rate	2.5	4.7	1.6	1.0	
Not treated	1.0	1.0	1.0	1.0	1.0
MCPA 1.0	1.1		1.0	1.0	1.0
MCPA 2.0	1.2		1.3	1.0	1.0
MCPA 0.75/Dicamba 0.125	3.6		2.9	1.0	1.7
MCPA 1.25/Dicamba 0.25	4.8		4.0	1.0	4.3
210/1 Double rate	3.9		2.2	1.0	2.7

*A = Treated at 6- to 6½-leaf stage (fully tillered) B = Treated at 7½- to 8-leaf stage (jointing to early boot stage)
 Score: 1.0 = no effect; 5.0 = most marked effect.
 Research 8 days after first treatment. Other varieties in full ear at dough stage.

TABLE 2: YIELD BUSHELS PER ACRE
(1965-6 Season)

Treatment (lb)	Kenia	Research	Barley Varieties Carlsberg	Swallow	Cape
MCPA 1.0	88 aA	60	96	84 aAB	
MCPA 2.0	86 aA	64	98	83 abAB	
MCPA 0.75/Dicamba 0.125	80 abAB	71	91	83 abAB	
MCPA 1.25/Dicamba 0.25	68 bcBC	68	93	79 abcAB	
210/1 Double rate	78 abAB	61	95	77 abcAB	
Not treated	82 aAB	66	94	79 abcAB	49 aA
MCPA 1.0	83 aAB	75	98	79 abcAB	51 aA
MCPA 2.0	80 abAB	68	97	87 aA	50 aA
MCPA 0.75/Dicamba 0.125	58 cCD	60	96	73 cB	42 abAB
MCPA 1.25/Dicamba 0.25	38 dE	64	99	84 aAB	32 bB
210/1 Double rate	47 dDE	59	92	83 abAB	39 abAB
CV	12%	18%	7%	7%	9%

*A = Treated at 6- to 6½-leaf stage (fully tillered) B = Treated at 7½- to 8-leaf stage (jointing)

search. In Kenia and Cape the high rate at 6½-leaf stage and all rates at the later time could be distinguished easily at this stage. Cape showed awn crumpling, some growth cracks and some pinched grain. Kenia had awn crumpling, many unfilled glumes, and in addition a large amount of second growth on the high rate late treated plots. The relative effect of treatment at full ear emergence within varieties is shown in Table 1. Comparison between varieties is valid only for Carlsberg and Swallow which were grown side by side, since 5 on the comparative scale represents the maximum effect at each site and not a standard level of effect for all sites.

Carlsberg and Research showed no significant differences in yield between treatments and control. In Kenia at the 6½-leaf stage, the double rate of MCPA plus dicamba significantly reduced yield, while at the later time all mixtures seriously reduced yield. Cape also showed a drop in yield from the double rate of MCPA plus dicamba when late sprayed.

Seedlings grown in boxes showed no abnormalities and no differences in emergence or establishment between treatments and control.

DISCUSSION

Research and Carlsberg react to dicamba but yield is not impaired, while with Kenia the reaction is accompanied by yield depression. The situation with respect to Swallow is in doubt since it showed no visible reaction and the yield depression occurred at the normal and not the double rate of application.

It would seem that, had the treatments been carried out at the recommended rates and time, no effect would have been detected in the malting varieties. It is also possible that this would have been the case with Cape.

The trials indicate the need for careful attention to timing and rates of application and for precise comparative trials.

REFERENCE

- Friesen, H. A.; Baenziger, H.; Keys, C. H., 1963: *Can. J. Plant Sci.*, 44: 288.