

Timing of application of phenoxy herbicides in wheat

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Summary Two field experiments were conducted under weed free conditions during 2000 at Avondale and Wongan Hills (in the Mediterranean environment of Western Australia) to determine optimum application times for phenoxy herbicides (MCPA and 2,4-D) on wheat. Six wheat varieties (Amery, Westonia, Karlgarin, Brookton, Camm and Calingiri) were planted in strips, and cross sprayed with amine and ester formulations of the herbicides at five different timings. The varieties were chosen because of their range in times to maturity. Five plants from each variety, at each application timing, were dissected to determine the development stage of the ear heads. Ear head deformities in terms of missing spikelets, rachis thinning and supernumerary spikelets were observed before harvest. The Wongan Hills site was drier than Avondale, with seeding two weeks later, and the season finishing more abruptly.

Ear head deformities were observed in all varieties at both sites when sprayed with phenoxy herbicides at or before the double ridge stage of ear development. Deformities caused by application of 2,4-D ester at 400 g a.i. ha⁻¹ at the four to five leaf stage translated into significant yield reductions only in Brookton at Wongan Hills. For all other varieties at both sites the deformities did not result in significant yield losses. No head deformities were observed when phenoxyes were applied after full flag leaf emergence and/or at

ear head emergence but significant yield reductions were recorded in Brookton for 2,4-D ester at 400 g a.i. ha⁻¹ at Wongan Hills.

The studies revealed that the addition of one leaf to the number of leaves present at double ridge is the time at which higher rates of 2,4-D or MCPA can be applied with minimal head deformities. For slower maturing varieties this was often later than the application timing indicated on the product label. However, visual ear head deformity symptoms caused by phenoxy herbicides were not a good indicator of yield penalty or adverse effect on grain quality parameters (screenings, hectolitre weight and protein per cent). Brookton was more sensitive to 2,4-D ester under late sown and moisture stress conditions than other varieties tested. MCPA formulations were safer than 2,4-D formulations.

Keywords Wheat, phenoxy, MCPA, 2,4-D, ear head deformities, double ridge, moisture stress.

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