

STUDIES WITH A DIQUAT-RESISTANT BIOTYPE OF CAPEWEED, *ARCTOTHECA CALENDULA*, THAT HAS RECENTLY APPEARED IN AUSTRALIA

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Abstract. A biotype of a common weed in southern Australia, capeweed, *Arctotheca calendula* L. Levyns, that is resistant to bipyridyl herbicides was found in 1986 at Elmhurst, near Ararat, Victoria. This resistant biotype of capeweed infests a field in which paraquat resistant barley grass, *Hordeum glaucum*, has been found. This field had been sown to lucerne, *Medicago sativa*, in 1958 and since then only bipyridyl herbicide has been used for weed control. Nineteen applications of diquat were made on this field over twenty-two years, with concomitant paraquat applications in all but three of these years.

In field trials we found that capeweed in this population was resistant to diquat. Results of glasshouse and laboratory experiments will be presented, confirming that this biotype is resistant to diquat and paraquat. The resistant biotype has an LD₅₀ for diquat approximately 6 times higher than that of the susceptible biotype. There appears to be no cross-resistance to non-bipyridyl herbicides. The resistant biotype suffers localised damage and a check in growth rate, but does not die at rates of diquat sufficient to kill all susceptible plants.

Results of experiments on the degree of resistance at various stages of plant development, and results of preliminary experiments studying photosynthesis and diquat movement in the resistant and susceptible biotypes, will also be presented.