

PHYTOTOXIC EFFECTS OF GLYPHOSATE AND
DIQUAT PLUS PARAQUAT ON LANDSCAPE TREES

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Abstract. Glyphosate and diquat/paraquat are used extensively by the Department of Territories and Local Government in Canberra for the control of weeds around the base of newly established landscape trees. Usually, the trees are less than 1 metre high with tall weeds growing right up to their trunks. Spray equipment is fitted with pressure control valves, low-drift nozzles and hoods over the nozzles to minimize herbicides contacting the desired plants. In certain circumstances, however, it is difficult to prevent some herbicide contact with trees whilst providing effective weed control.

A trial was established to study the effects of glyphosate and diquat/paraquat applied to the foliage and/or young bark on trunks of 1.5 year-old red spotted gum (*Eucalyptus mannifera* ssp. *maculosa*) and Cootamunda wattle (*Acacia baileyana*) which are commonly used landscape trees in the A.C.T.

Herbicides were applied to the lower 100mm of tree trunk, lower half of the tree (foliage and trunk) and the entire tree at normal application rates.

Applications of the herbicides onto the foliage of both tree species caused plant death usually within one month of application. Applications of the herbicides to the basal trunk area gave varying results. Glyphosate was rapidly translocated from the young bark to the foliage of both tree species, and all treated trees exhibited slight leaf chlorosis and necrosis within one month of treatment.

Eighty percent of Cootamunda wattle trees had recovered from this damage within 6 months. Red spotted gum trees were more adversely affected with the majority of trees being severely damaged or dead within 6 months of treatment, and only 40 percent recovered from the phytotoxicity.

Diquat/paraquat showed no signs of translocation from the trunk to the foliage. Both tree species developed slight necrotic areas on the trunk within one month of application. With Cootamunda wattle there was a 60 percent recovery from this damage within 6 months. There was only 20 percent recovery with red spotted gum, and trunk damage deteriorated to a virtual 'ring-barking' of the tree causing defoliation or death to 80 percent of trees.

With both tree species and both herbicide treatments a significant number of the trunk treatment trees developed a constricted stem diameter or depressed necrotic lesions within the treated area. The normal strength of the trunk was reduced by this damage, and plants were observed to be more prone to stem breakage during strong wind conditions.

Trained operators provided with suitable equipment are unlikely to apply these herbicides onto tree foliage, but these results highlight the need to also avoid herbicide application to the young bark of landscape trees.