

MECHANISM OF SELECTIVITY OF DIPHENYL ETHER HERBICIDE OXYFLUORFEN

J.J. Lee, H. Matsumoto and K. Usui
Institute of Applied Biochemistry, University of Tsukuba, Ibaraki, Japan

The selectivity mechanism of oxyfluorfen [2-chloro-1-(3-ethoxy-4-nitrophenoxy)-4-trifluoromethylbenzene] among several plant species was studied. Rice and corn were tolerant and absorbed less oxyfluorfen than tomato, cucumber and buckwheat. Degradation of ¹⁴C-oxyfluorfen in the susceptible plants was very limited. Large amounts of protoporphyrin IX (Proto IX) accumulated in the herbicide-treated plants, however, the profile of the accumulation was different among the species. Protoporphyrinogen IX oxidase (Protox) was very susceptible to oxyfluorfen. I50 concentration of Protox activity from different plant species ranged from 1.4 nM to 30 nM. The activity of endogenous antioxidative enzymes was also different among the tested plants and rice had a higher activity than the others.

TOLERANCES OF OAT AND TRITICALE CULTIVARS TO HERBICIDE

D. Lemerle and R.B. Hinkley
NSW Agriculture, Agricultural Research Institute, Wagga Wagga NSW 2650, Australia

The tolerances of cultivars of oat (Cooba, Coolabah, Dalyup, Echidna, Bandicoot and Mortlock) and triticale (Muir, Madonna, Currency and Tahara) to post-emergence herbicides under weed-free conditions were examined in the field in 1991 and 1992 at Wagga Wagga. Herbicides were applied at standard recommended (1XR) and twice recommended (2XR) rates and grain yield was used as a measure of tolerance.

At both rates of application, diuron, chlorsulfuron and dicamba plus MCPA were safe on all oat cultivars. Grain yields were reduced 10% in Mortlock and Dalyup in 1991 by 1XR of bromoxynil, diflufenican plus MCPA and diflufenican plus bromoxynil. Dalyup was also sensitive to terbutryne plus metsulfuron.

In 1991, triticale cvs Muir and Tahara had grain yields reduced 12% from the 1XR of diclofop-methyl, and by 19% (Tahara) and 38% (Muir) from 1XR of metsulfuron-methyl. Currency and Madonna were both sensitive to terbutryne plus triasulfuron at 1XR in 1992. All triticale cultivars were tolerant of tralkoxydim, chlorsulfuron, dicamba plus MCPA, bromoxynil, diflufenican plus bromoxynil, diflufenican plus MCPA, and terbutryne plus MCPA.

Significant differences in the tolerances of oat and triticale cultivars to recommended rates of herbicides was demonstrated and further studies are in progress on a wider range of cultivars and herbicides.