

SELECTIVE MODE OF ACTION OF PYRAZOSULFURON-ETHYL AMONG RICE CULTIVARS AND *CYPERUS SEROTINUS*

K. Kobayashi and H. Sugiyama
National Agriculture Research Center, Tsukuba, Japan

Pyrazosulfuron-ethyl is a sulfonylurea herbicide for the control of most broadleaf and cyperaceous weeds in paddy rice. The growth of root and shoot was suppressed more strongly in *Cyperus serotinus* than in rice grown in a water culture containing pyrazosulfuron-ethyl. *In vitro*, the activity of acetolactate synthase (ALS) from each organ of both plants was highly and similarly sensitive to pyrazosulfuron-ethyl. The activity of ALS extracted from plants previously treated with the herbicide was more reduced with elapsed time in roots and shoots of *C. serotinus* after treatment. In rice the reduced activity of ALS in treated roots and shoots was remarkably recovered as a function of time after treatment. Among tested rice cultivars, *indica* type cultivars were generally more tolerant to pyrazosulfuron-ethyl than *japonica* type cultivars. Inhibition of ALS activity in each organ was similar in degree between *indica* and *japonica* type cultivars *in vitro*. The results suggest that the primary site of action of pyrazosulfuron-ethyl is ALS, and that its selectivity depends on the difference in degree of inhibition on ALS activity *in vivo*, which could be caused by the different ability in inactivation of pyrazosulfuron-ethyl.

THE MECHANISM OF ACTION OF DIMEPIPERATE ON SEVERAL OTHER HERBICIDES IN RICE SEEDLINGS

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

The interactions between the thiocarbamate herbicide, dimepiperate (S-(α , α -dimethylbenzyl) piperidine-1-carbothioate) and 7 compounds of herbicides, and the effects of dimepiperate on absorption, translocation, and metabolism of [14 C]labelled bensulfuron methyl, oxyfluorfen, clomeprop and pyributicarb simultaneously applied to the early stage of rice seedlings were examined. Their interactions were evaluated based on Colby's and/or the Isobole method. The data indicated that there were antagonistic effects between dimepiperate and all the herbicides tested except for pretilachlor. Thus, the safening effect of dimepiperate on the rice seedlings was confirmed. Dimepiperate did not affect translocation of and metabolism of all [14 C]labelled herbicides, whereas it decreased their absorption in rice plants. The decrease in the herbicide absorption seemed to contribute to the safening effect of dimepiperate.

The safening effect of dimepiperate was clearly demonstrated to a wide range of the chemicals with different modes of action.