

## DEVELOPMENT OF IMMUNOCHEMICAL ASSAYS FOR CHLORSULFURON

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*Abstract.* Chlorsulfuron and other sulfonylurea herbicides are used at very low application rates (10-20 g/ha) to control both broad-leaved and grass weeds in cereal crops. Under certain conditions (e.g. alkaline soils and low rainfall), chlorsulfuron can persist long enough to affect the growth of subsequent crops. The problem can be particularly serious when broad-leaved crops such as rapeseed, sunflower, or grain legumes are sown in rotation with cereals. Field experiments have shown that crop growth can be severely reduced by chlorsulfuron residues as low as 0.5 ppb in soil solution. This concentration is at the very limit of detection of the most sensitive chemical and bioassay systems presently available for this herbicide. Consequently, chlorsulfuron residues are not measured routinely in Australia.

We are currently developing enzyme linked immunosorbent assay (ELISA) test kits for chlorsulfuron and metsulfuron. Specific antibodies of high sensitivity against chlorsulfuron have been raised. The methodology of the chlorsulfuron immunoassay is described in the accompanying poster. The development of simple, rapid, accurate and inexpensive immunochemical assays capable of detecting 0.1 ppb of herbicide residues of soil would have two immediate applications to Australian agriculture. Firstly, it would enable consultants and farmers to measure residual chlorsulfuron in the field. This could be used to identify potential toxicity problems, or to help determine appropriate re-application rates, thereby avoiding a build-up of dangerously high levels which may cause problems for a subsequent crop. Secondly, this test would enable agricultural scientists to develop better predictive models of the persistence of chlorsulfuron and related herbicides, thereby supplying the farmer with a means to predict the likely extent of chlorsulfuron persistence from simple observations on climate, crop management history and soil type.

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