

## Investigation of herbicide resistance in Indian hedge mustard (*Sisymbrium orientale* L.)

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**Summary** Indian hedge mustard (*Sisymbrium orientale* L.) (IHM) is a problematic broadleaf weed in southern Australia, which has become more difficult to control in field crops due to the evolution of herbicide resistance. Despite several previous studies, there is little information available on resistance in IHM to some herbicide groups.

This study investigated the extent of resistance and multiple resistance to different herbicide groups. Fifty five populations were screened for herbicide resistance in 2014 and 2015. Resistance was confirmed to group B, C, F and I herbicides. Resistance was more common to group B (n = 24, 44%) followed by resistance to group F (n = 11, 20%); seven populations were resistant to group C and four populations were resistant to group I herbicides. Several populations exhibited

multiple resistance to more than one herbicide mode of action with four populations resistant to group B, C and F; four populations resistant to group B and I and one population resistant to group F and I herbicides. Representative resistant populations for each herbicide group and one known susceptible population were used in dose response experiments to quantify the level of herbicide resistance.

The resistance level of all populations was generally high and varied depending on the herbicide from 20 to 1940-fold compared to the susceptible control. The most resistant populations were selected for the study of genetics of herbicide resistance to group I, C and F.

**Keywords** Herbicide resistance, Indian hedge mustard, diflufenican, atrazine, 2,4-D.