

## ***Phalaris minor* resistance is increasing and solutions urgently needed to farmers of Punjab and Haryana**

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**Summary** Wheat is a major cereal crop in north India (Punjab and Haryana). It is grown on an area of 60 million hectare with production of around 160 metric tonnes and average yield of 4.6 metric tonne per hectare. *Phalaris minor* is the major problem weed in wheat which leads to heavy losses in wheat grain yield. Therefore, timely control measures are needed to mitigate the yield loss. The resistance in *P. minor* to herbicides of different modes of action is increasing in almost all wheat growing areas, including the rice-wheat rotation areas. A recent farmers' survey in more than 50 villages in Punjab indicated that some farmers (15%) used sulfosulfuron alone or tank-mix of sulfosulfuron and clodinafop before first irrigation. Some farmers used tank-mix of clodinafop plus metribuzin (30%), pinoxaden plus metribuzin (10%), mesosulfuron plus iodosulfuron (10%), and metribuzin

alone (5%) after first irrigation. The surveyed farmers reported that the available recommended chemicals are not effective now, which they attribute to poor quality of the herbicides or development of resistance in *P. minor* against herbicides.

Alternative solutions for the effective management of *P. minor* in the region include direct-drill of wheat into standing stubbles of rice (to reduce the weed density), improved spray technology (to enhance herbicides efficacy), rotation of different herbicidal modes of action (to extend life of herbicides) and use of new chemicals (to provide immediate relief to wheat growers). The adoption of these alternative strategies will effectively manage *P. minor* and will reduce wheat yield loss in north India.

**Keywords** India Haryana Punjab farmers, herbicides, *Phalaris minor*.