

Weed Management in Wheat Crop

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SUMMARY

The productivity of any crop may also be decided by the weeds grown along with the crop. Weeds are gifted with more resistance to abiotic stresses and with better nutrient absorption capacity than crops. Integrated weed management practices need to be focused to effectively manage the weeds in any crop. Weeds are also common in wheat crop like any other crops. Herbicides usage in wheat crop is an effective option for control of certain weeds in wheat if used properly. However, only using herbicides may not solve all weed problems. Some herbicides are approved for use on wheat crop on different weed species. Weeds seeds emerge out along with emerging crop seedlings. If weeds are not controlled from early stages of crop growth, depending upon the intensity and type of weeds these may cause reduction in yield of the crop up to 40 %.

INTRODUCTION

Wheat is an important cereal crop. The pre-dominant weeds associated with wheat crop are *Anagallis arvensis*, *Argemone Mexicana*, *Asphodelus tenuifolius*, *Avena ludoviciana*, *Cannabis sativa*, *Carthamus oxycantha*, *Chenopodium album*, *Cirsium arvense*, *Convolvulus arvensis*, *Cornopus didymus*, *Euphorbia jelioscopia*, *Fumaria parviflora*, *Lathyrus aphaca*, *Malva parviflora*, *Medicago denticulata*, *Malilotus alba*, *Phalaris minor*, *Poa annua*, *Polygonum plebejum*, *Polypogon monspeliensis*, *Rumex retroflex*, *Spergula arvensis*, *Vicia sativa*. *Phalaris minor* is the major weed of wheat crop in rice - wheat cropping system. Sometimes its population is so high (2000-3000 plants m²) that farmers are forced to harvest the wheat crop as fodder. Isoproturon (Arelon) was recommended for the control of *Phalaris minor* in 1980s. It remained effective for almost a decade. However, sole dependence on this herbicide resulted in the development of resistance to Isoproturon in *Phalaris minor*. In zero tillage fields, the intensity of *Rumex* and *Malwa parviflora* is increasing and may become a problem in the coming years. Therefore, we must remain vigilant regarding weed flora shift due to changes in tillage practices.



Weed Management Practices in Wheat

Various practices of weed management can be grouped into three broad categories namely cultural and preventive; physical or mechanical; and chemical weed control. These practices are discussed below;

Cultural and Preventive

Cultural practices such as time and method of sowing, crop density and geometry, crop varieties, dose, method and time of fertilizer application, time and method of irrigation have pronounced effect on crop-weed interference. Some of these factors are listed below:

- Use clean wheat seed that is free from weed seeds.
- Go in for early sowing of wheat (before 15 Nov.).
- Adopt closer row spacing (18 cm).
- Adopt criss-cross sowing to increase population density of the wheat plants.
- Place basal dose of fertilizer 2-3 cm below the seed.
- Sowing of wheat on FIRBS reduces weed population.
- Pull out weeds before seed setting.
- Keep blinds & irrigation channels free from weeds.
- Introduce either berseem or oat for fodder, as a crop rotation, sown once in three years.
- Stimulate emergence of Phalaris by giving light irrigation followed by weed control with non-selective herbicides like glyphosate or cultivation followed by sowing of wheat.
- Zero tillage offer a way to manage Phalaris but continuously practising zero tillage invites problem from other weeds.
- Grow fast growing and robust varieties of wheat.

Mechanical Control

It involves the removal of weeds by various tools & implements including hand weeding & pulling. It is not feasible where weeds resemble morphologically to crop e.g. P. minor & Avena ludoviciana before flowering in wheat. Also, mechanical weed control becomes difficult in broadcast sown wheat. However, mechanical control can be practiced effectively when wheat is sown on FIRBS as this system facilitates tractor mounted implements usage.

Chemical Control

Chemical weed control is preferred because of less labor involvement and no mechanical damage to the crop that happens during manual weeding. Moreover, the control is more effective as the weeds even within the rows are killed which invariably escape, because of morphological similarity to wheat, during mechanical control. The following weedicide schedule has been found effective in controlling the Isoproturon resistant population of Phalaris minor.

Pre-emergence

As pre-emergence, only Stomp 30EC (Pendimethalin) is available which can be applied @ 3300 ml/ha (1000 g a.i./ha) at 0-3 days after sowing in 500 liters of water /ha. Care must be taken to have fine tilth for better performance of pendimethalin. It controls both grasses and broadleaved weeds.

Post-emergence

During the last few years a number of herbicides were found effective against even the resistant biotypes of Phalaris minor. Out of the four new herbicides found effective against Phalaris, two namely Sulfosulfuran and Metribuzin were effective against both grassy and non-grassy weeds, whereas clodinafop and fenoxaprop were specific to grassy weeds. Application of Metribuzin should be done carefully as this chemical is not safe at double the recommended dose. Also, its application is risky if hot and windy weather prevails and rainfall occurs immediately after its spray application.

The herbicides that are to be applied as post emergence after first irrigation at 30-35 days of sowing or 2-3 leaf stage of Phalaris minor are;

Both Grassy and Broad Leaved

1. Sulfosulfuran @ 25.0g a.i./ha in 250-300 liters of water /ha.
2. Metribuzin @ 175 g a.i./ha in at least 500 liters of water /ha.
3. A mixture of Sulfosulfuran at 25g/ha and metsulfuron methyl @ 4 g/ha in 250-300 liters water /ha.

4. Combination of 2,4-0 and isoproturon can also be used for the control of mixed weed population in resistance free area.

Only Grassy Weeds

1. Clodinafop @ 400 g/ha (60g a.i./ha) in 250-300 liters of water / ha.
2. Fenoxaprop-ethyl @ 80-120g a.i./ha in 250-300 liters of water / ha.

Only Broadleaf Weeds

1. 2,4-0 @ 500 g a.i./ha in 250-300 liters of water /ha.
2. Metsulfuron methyl @ 4 g a.i. / ha 250-300 liters of water /ha.

Some Useful Hints

Do's

- Spray the herbicides, both pre and post emergence, when there is sufficient moisture in the soil.
- Spray the post-emergence herbicides when Phalaris minor is at 2-3 leaf stage.
- Spray on clear and sunny days only when the leaves are dry.
- Use only flat fan nozzle especially for Fenoxaprop.
- Remove Phalaris minor before seed setting and use as fodder.
- Ensure complete coverage of the field.

Don'ts

- Do not use Sulfosulfuran in mixed cropping system of wheat and mustard or other crops.
- Never apply these post emergence herbicides by mixing with sand, urea or soil.
- Do not mix Clodinafop and Fenoxaprop with 2,4-D

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