



Different Types of Pre, Post and Ready-Mix Herbicides for Weed Management Practices of Wheat Crop

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Herbicide: A phytotoxic chemical use for killing/suppress the growth of the plant. This is a broader term.

Weedicide: Indicates the chemical which is toxic to weeds. This is a narrow term.

There are numerous factors that influence crop growth and production. The initial infestation of weed is one of the important factors, which hinders its overall growth and productivity. The weeds compete with the crop plants for all resources required for growth like space, water, sunlight, and air and causes a reduction in crop yield (Verma et al. 2015). The critical period of crop weed competition is 30-35 DAS and if weeds are not controlled during this there is an identical reduction in the yield of wheat from 25-30 per cent, depending upon the types and intensity of weeds.

The major weed flora in wheat crop is, *Phalaris minor*, *Chenopodium album*, *Avena fatua*, *Avena ludoviciana*, *Cyperus rotundus*, *Convolvulus arvensis*, *Melolotus alba*, *Melolotus indica*, *Cirsium arvense*, *Lathyrus aphaca*. (Saha et al. 2006)

Weed management at right time and optimum dose of nitrogen are most important factors which may affect the wheat productivity. Manual weeding is most widely used practice of weed management. However, it is labour intensial, and costly. Besides, intra-row weeds remain uncontrolled. Chemical weed control is a preferred practice due to scarce and costly labour as well as lesser feasibility of mechanical or manual weeding (Chaudhari et al. 2017). Herbicides were largely accepted by the farmer to control this notorious weed. Continuous use of a single herbicide may shift the weed flora in favour of species that are not controlled, thus creating the problem in controlling weeds (Alemu et al. 2016). Therefore, use of herbicide in combinations which have broad-spectrum of weeds control and sometimes such combinations can give spectacularly good control at the doses considerably below to those normally applied in single application. Nowadays there are so many good ready-mix combinations of herbicides used for weed control in wheat and they were found effective in controlling broad spectrum weeds in wheat.

Approved Uses of Registered Herbicides

Herbicide name & approved Crops	Weed species	Dosage /ha		Dilution In Water (Litres)	Waiting period /PHI between last application & harvest (days)
		a.i. (gm/ Kg)	Formulation in (gm/ml /Kg/ ltr)		
Carfentrazone ethyl 40% DF (PoE)	<i>Chenopodium album</i> , <i>Melilotus</i>	20gm	50gm	400	80

	<i>Indica, Melilotus alba, Medicago denticulata, Lathyrus aphaca, Anagalis arvensis, Vicia sativa, Cirsium arvense, Rumex sp, Malwa sp.</i>				
Clodinafop-propargyl 15% WP (PoE)	<i>Phalaris minor (Canary grass)</i>	60gm	400gm	375-400	110
Clodinafop-propargyl 15% w/w DF (PoE)	<i>Phalaris minor (Canary grass)</i>	60gm	400gm	500	70
2,4-D Dimethyl Amine salt 58% SL (PoE)	<i>Chenopodium album, Fumaria parviflora, Melilotus alba, Vicia sativa, Asphodelus tenuifolius, Convolvulus arvensis,</i>	0.5-0.75 kg	0.86-1.29	500-600	-
2,4-D Sodium salt Technical (having 2,4-D acid 80 % w/w) (Earlier Registered as 80% WP) (PoE)	<i>Leucas aspera, Chenopodium album, Vicia sativa, Argemone maxicana, Fimbristylis miliacea, Anagalis arvensis, Amaranthus spinosus.</i>	0.5-0.84 kg.	0.625-1.0	500	90
2,4-D Ethyl Ester 38 % EC (having 2,4-D acid 34 % w/w) (PoE)	<i>Chenopodium album, Asphodelus tenuifolius, Fumaria parviflora, Melilotus alba, Spargula arvensis</i>	0.45-0.75 kg	1.32-2.2	450-500	-
Diclofop-Methyl 28% EC (PoE)	<i>Avena fatua, Phalaris minor</i>	0.7-1.0 kg	2.5-3.5 ltr	500	90
Fenoxaprop-p-ethyl 10% EC (PoE)	<i>Phalaris minor</i>	100-120gm	1.0-1.20kg	250-300	110
Flumioxazin 50% SC (PE)	<i>Runnax spp., Medicago denticulate, Coronopus didymus, Chenopodium album, Phalaris minor, Avena fatua</i>	125 gm a.i. /ha	250ml/ha	500	137
Isoproturon 50% WP (PE & PoE)	<i>Phalaris minor Avena fatua</i>	1.0kg	2.0	750	-

	<i>Poa annua</i>				
Isoproturon 75% WP (PE & PoE)	<i>Phalaris minor</i> <i>Avena fatua</i> <i>Poa annua</i>	1.0kg	1.33kg	750	60days
Methabenzthiazuron 70% WP (PE -2DAS)	<i>Phalaris minor</i> , <i>Avena fatua</i> , <i>Avena ludoviciana</i> , <i>Poa annua</i> ,	1.05-1.4kg	1.5-2.0 kg.	700-1000	100
Metribuzin 70% WP (PE & PoE)	<i>Phalaris minor</i> <i>Chenopodium album</i> <i>Melilotus spp</i>	Medium soil-0.175kg Heavy soil - 0.21kg	0.25 kg 0.30 kg.	500-750	120
Metsulfuron Methyl 20% WP (PoE)	<i>Chenopodium album</i> , <i>Melilotus indica</i> , <i>Lathyrus aphaca</i> , <i>Anagallis arvensis</i> , <i>Vicia sativa</i> , <i>Cirsium arvense</i> .	4gm	20gm	500-600 + Surfactant (Iso-Octyl PhenoxyPoloxethanol 12.5%) @ 500 ml/ha	80
Metsulfuron Methyl 20% WG (PoE)	<i>Chenopodium album</i> <i>Melilotus indioca</i> <i>Melilotus alba</i> <i>Lathyrus aphaca</i> <i>Anagallis arvensis</i> <i>Vicia sativa</i> <i>Rumex denticulate</i> <i>Convolvulus arvensis</i> <i>Meedicago denticulate</i>	4gm	20gm	500-600 + Surfactant (IsoOctyl Phenoxy - Poloxethanol 12.5%) @0.2%	76
Sulfosulfuron 75% WG (PoE)	<i>Phalaris minor</i> <i>Chenopodium sp.</i> <i>Melilotus alba</i>	25	33.3	200-250 + Cationic surfactant 1250ml/h a	110
HERBICIDE COMBINATIONS					
Carfentrazone ethyl 20% + Sulfosulfuron 25% WG (PoE)	<i>Phalaris minor</i> <i>Avena ludoviciana</i> <i>Chenopodium album</i> <i>Medilotos alba</i> <i>Rumex spp</i>	20+25 +750 ml Surfactant	100	300	110
Clodinafop Propargyl 15% + Metsulfuron Methyl 1% WP (PoE)	<i>Phalaris minor</i> , <i>Avena fatua</i> , <i>Chenopodium album</i> , <i>Melilotus sp.</i> , <i>Fumaria parviflora</i> , <i>Vicia sativa</i> , <i>Rumex sp.</i> , <i>Anagallis arvensis</i> , <i>Coronopus didymus</i> , <i>Lathyrus sp.</i> , <i>Convolvulus arvensis</i>	60+4	400	375 (Add 1250 ml surfactant at the time of sparying)	100

Fenoxaprop-p-ethyl 7.77% w/w + Metribuzin 13.6% w/w EC (PoE)	<i>Phalaris minor</i> (Little seed canary grass) <i>Chenopodium album</i> (Lambs quarter) <i>Lathyrus aphaca</i> (Meadow Pea) <i>Rumex Sp.</i> (Golden dock) <i>Melilotus spp.</i> (Sweet clover) <i>Avena ludoviciana.</i>	100+175	1250	375	110
Metribuzin 42% + Clodinafop propargyl 12% WG (PoE)	<i>Phalaris minor</i> (Canary grass), <i>Avena spp.</i> (Wild oat), <i>Chenopodium album</i> (Fat hen), <i>Melilotus sp.</i> (Sweet clover), <i>Medicago denticulate</i> (Toothed medic),	210+60	500	375	92
Sulfosulfuran 75%+ Metsulfuron Methyl 5% WG (30-35 DAS)	<i>Phalaris minor</i> , <i>Chenopodium sp.</i> , <i>Medicago denticulata</i> , <i>Coronopos dedymus</i> , <i>Rumex spp.</i> <i>Melilotus alba</i> , <i>Anagallis arvensis</i>	(30+2)	40	250-500 + surfactant 1250 ml/ha	110

References

1. Government of India, Ministry of Agriculture & Farmers Welfare, Directorate of Plant Protection, Quarantine & Storage, Central Insecticides Board & Registration Committee, N. H. IV, Faridabad (Haryana), 2023.