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Weed dynamics in wheat as influenced by wheat establishment and weed control methods

Research Paper

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ABSTRACT : A field experiment was conducted at Varanasi to assess the weed dynamics and wheat yield as influenced by wheat establishment and weed control methods in wheat. The dominant weed species were *Chenopodium album* L., *Rumex dentatus* L., *Melilotus alba desr., Anagallis arvensis* in broad leaved weeds and *Phalaris minor Retz., Cynodon dactylon* (L.) Perr., in grassy weeds during both the years, respectively. Zero tillage recorded significantly lower density and dry weight of weeds and highest wheat grain yield, which was at par with sowing of wheat by rotavator drill and superior over other tillage treatments. Application of isoproturon + 2,4-D (1.0 + 0.5 kg/ha) significantly reduced the population and the dry weight of weeds, and also maximum wheat grain yield was obtained as compared to rest of herbicides except metribuzin (210 g ha⁻¹), during both the years of experiment. Establishment of wheat under zero tillage with isoproturon +2, 4-D was most effective in arresting weed population, and its growth, and also enhancing wheat grain yield.

Key Words : Herbicides, Wheat, Wheat establishment methods

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mong agronomical methods, manipulation of sowing method has showed suppressing effect on minimizing weeds and their growth. In our country, about 40 per cent of the wheat is grown in rotation with rice (Chauhan et al., 2000) and due to this cropping pattern productivity of rice and wheat system is declining, which is causing greater concern about the sustainability of rice wheat system. The major constraints for poor yield of wheat are poor crop stand, delay planting, poor soil physical conditions due to puddling of rice field and heavy infestation of weeds. To overcome these constraints, minimum tillage concept has been recognized as a major solution, particularly for reducing the weed infestation and minimizing cost of tillage operation and overall to sustain the wheat production in rice-wheat system. With the adaptation of dwarf wheat over extensive area in predominant rice-wheat cropping system of north India, weeds flourished luxuriantly owing to availability of moisture and nutrients in abundance, and posed serious problem for the growth and development of wheat. In general, major problem under high input wheat production system is interference of weeds which alone causes yield reduction to an extent of 15-40 per cent and sometimes even higher. Malik et al. (1989) estimated 30 per cent reduction in yield of wheat due to infestation of weeds. Weed management

is a major input in wheat production, and in present context herbicides have got prime position for better management of weeds especially in minimum tillage conditions where chemical weeding has been recognized as pre-requisite. For last two decades, continuous use of isoproturon led to the selection of resistant *Phalaris minor* biotypes and also shifts in weed flora (Malik and Singh, 1993). To overcome this problem, recently introduced herbicides like metribuzin, sulfosulfuron, metsulfuron methyl, sulfonyl urea have been recommended to control grassy and broad leaf weeds in cereals like wheat and barley. Mixture of isoproturon +2,4-D, metoxuron +2,4-D and pendimethalin + oxyfluorfen have been recommended in wheat culture. Keeping these facts in view, the present investigation was undertaken.

RESEARCH **P**ROCEDURE

A field experiment was conducted during winter seasons of 2003 and 2004 at the Agricultural Research Farm, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi. The soil was sandy clay loam with pH 7.5. It was moderate in fertility status being low in organic carbon content (0.46%) and available N (210.15 kg/ha) and medium in available P_2O_5 (20.65)