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Effectiveness of biopesticides for aphid pest management in wheat

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Abstract

Wheat is a potential crop that could meet the country's food requirements. Insect pests are a key source of yield losses in the wheat crop. Aphids are among the economic yield reducing major pests of wheat. Aphid management is an essential aspect of increasing wheat yields. The cherry oat aphid, *Rhopalosiphum padi* Linnaeus, green bug, *Schizaphis graminum* Rondani, and corn leaf aphid, *Rhopalosiphum maidis* Fitch (Hemiptera: Aphididae) are all recorded to damage the wheat crop. Insecticides are used exclusively to control pests. Additionally, increasing applications of synthetic insecticides have resulted in higher resistance and pest resurgence. Alternatively, the use of botanicals along with insecticides can affect the activity of the aphid. The current research has been planned keeping in view the importance of managing aphid pests. The study evaluated the effectiveness of botanicals i.e., Neem, *Azadirachta indica* A. Juss, Kortuma, *Citrullus colocynthis* Linnaeus, Tobacco, *Nicotiana tabacum* Linnaeus, silver nanoparticle spray, S1 bacteria (S1B), Biopesticide (Bio-N), one insecticide Advantage, and Control on wheat aphid and their biological control i.e., ladybird beetle, Syrphid fly, and *Chrysoperla carnea* Stephens. Field experiments were done on wheat crops in the MNS-University of Agriculture, Multan experimental areas. Randomised complete block design under factorial was followed with three replications. Data was recorded before and after 24, 48, 72 and 168 hours. Research on the population dynamics of different species of aphids revealed significant differences in the treatments of kortuma, Ag nanoparticle, and Bio-N treatments. There was a significant population of ladybird beetle/plant found in the case of kortuma and silver nanoparticle treatments during 2nd week of spray ($p < 0.05$). The data showed that the effect of biopesticide like Ag nanoparticle, Bio-N and kortuma was relatively better as compared to all other treatments because of less resistance. Aphid populations were higher in the control case and certain other biopesticide treatments like neem, tobacco and S1 bacteria after particular hours. The data obtained revealed that biopesticides had a considerably better effect than conventional treatments because of reduced resistance and the fact that it was produced under natural conditions.

Keywords: Aphid, biological control, biopesticides, botanicals, management, wheat