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## Exogenous application of salicylic acid and puccinia triticina pre-inoculation reduces diuraphis noxia-induced leaf damage in wheat

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Russian wheat aphid (RWA: *Diuraphis noxia*, Kurdjumov) is an economically significant wheat (*Triticum aestivum* L.) pest. Aphid infestation can damage wheat plants and significantly reduces yield and quality. Even though pesticides and resistance breeding are practical control options, chemicals can be harmful to the environment and potentially contaminate food. On the other hand, resistance breeding is vulnerable to aphids evolving into resistance-breaking biotypes at a rate that may surpass the release of resistant cultivars. The effect of salicylic acid and *Puccinia triticina* Eriks (Pt) isolates on the resistance response of wheat cultivars with varying resistance to RWASA1 (South African biotype 1) were evaluated at the seedling and flag leaf stages. Aphid leaf damage was assessed on ten wheat plants treated with salicylic acid or inoculated with Pt isolates using rating score, and

damage analysis indicated that Pt isolates were more efficacious than salicylic acid and selectively primed wheat cultivars for increased resistance to RWASA1. Out of ten wheat cultivars, PAN 3118, PAN 3161, PAN 3111 successfully primed at the seedling stage, while at the flag leaf stage, only PAN 3111, SST 356 and Makalote were primed for increased resistance. The primed plants expressed higher antioxidative enzyme activities (superoxide dismutase, guaiacol peroxidase, and ascorbate peroxidase) than controls. The results indicate that avirulent Pt isolates could be a potential priming agent for improved resistance to RWA infestation. Further confirmation of the priming effects under field conditions could indicate the economic value of the priming strategy.

**Keywords:** Leaf damage, priming, salicylic acid, *Puccinia triticina*, Russian wheat aphid, wheat.

### Biography

Huzaifa Bilal, a promising researcher, is affiliated with the Department of Plant Sciences at the University of the Free State in Bloemfontein, South Africa. With a profound interest in plant sciences, Bilal actively engages in innovative research. His work contributes to the advancement of knowledge and solutions in the realm of plant science, showcasing his dedication to academic excellence and scientific exploration.

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