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Effect of water deficit stress on aphid (*Acyrthosiphon pisum*) population in lucerne (*Medicago sativa* L.)

Sateesh Kumar[1*], M. Vignesh[1], N.S. Kulkarni[2], M.B. Doddamani[1], K. Sridhar[2], S. Karthigeyan[3] and Edna Antony[2]
[1]University of Agricultural Sciences, Dharwad-580005, India
[2]Southern Regional Research Station, ICAR-IGFRI, Dharwad-580005, India
[3]ICAR-Sugarcane Breeding Institute, Coimbatore-641007, India
*Corresponding author e-mail: sathishvs200@gmail.com
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Abstract
Water deficit stress occurs in lucerne during the non-rainy season when the gap between irrigation exceeds 20 days. Water deficit stress reduces the biomass as well as exposes the lucerne to several insect pests. Aphids are the major sucking pests of lucerne, which causes significant economic damage by feeding on phloem sap. The stress due to water deficit could alter the phloem sap constituents, turgor pressure, and other biochemical constituents in lucerne compared to non-stressed plants. In this study, it was observed that levels of water deficit attracted or deterred the aphid population. At 4.8% soil moisture, insect population was higher compared to 2% soil moisture. Concomitantly there were variations in phenol fractions and sugar fractions. Benzoic acid fractions and monosaccharides were high at 4.8% soil moisture, whereas cinnamic acid derivatives and disaccharides were high at 2% soil moisture. Weather parameters order the appearance of aphids, and the soil moisture status dictates biochemical constituents like phenols and sugars within plants that attract or deter aphids that feed on phloem sap in lucerne.

Keywords: Aphids, Irrigation, Lucerne, Moisture stress, Phenols, Sugars