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Fertiliser and Water Regime Influence Preference of *Solanum scabrum* (Solanaceae) by Tomato Red Spider Mite

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Abstract

Fertiliser and water supply are important agronomic practices in crop production that have profound impact on plant quality and may influence host selection by herbivorous arthropods. According to the preference–performance hypothesis adults should prefer traits that maximise fitness, i.e. provide best performance for offspring. One of the most serious pests, the tomato red spider mite, *Tetranychus evansi* (Acari: Tetranychidae) is an invasive pest in Africa that causes severe damage to solanaceous plants including African nightshades, i.e. economically and nutritionally important indigenous leafy vegetables. In the context of the HORTINLEA project (www.hortinlea.org) effects of fertiliser and water supply to African nightshades, *Solanum scabrum* var. Olevolosi, on host plant preference by the tomato red spider mite were investigated in laboratory and greenhouse experiments with the aim to develop integrated pest management of African leafy vegetables. A petri-dish assay with leaf discs obtained from plants receiving different fertiliser and water treatment combinations was used. The fertiliser treatments were full (1), 1/2 and 1/4 strength concentration of Hoagland nutrient solution and watering regimes at 40, 60, and 80 % field capacity. Greenhouse experiments were laid out as a complete block design with plants receiving six different fertiliser rates positioned on a circle (1 m diameter) with a donor plant placed at the centre. Laboratory bioassays showed that *T. evansi* preferred leaf discs supplied with high rates of fertiliser and water. In greenhouse studies, mites on nightshade plants treated with full strength of the nutrient solution were 5 times more than the other treatments. The indication that *T. evansi* prefers plants that are highly nourished suggests implications for management of water and fertiliser against this pest in smallholder vegetable farming systems in Africa.

Keywords: Host selection, leafy vegetables, plant nutrition, *Tetranychus evansi*