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Factors influencing
selection of
settling sites within plants
and oviposition
by greenhouse whitefly
(*Trialeurodes vaporariorum*
Westwood)

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requirements for the degree of Doctor of Philosophy in
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Abstract

Orientation by adult greenhouse whitefly (*Trialeurodes vaporariorum* Westwood) to younger leaves is induced by negative geotaxis and positive phototaxis but there is a minor effect of features of the leaves. The selection of the lower leaf surface is predominantly the result of a preference for being upside-down (ie. a response to gravity) but leaf characteristics also play a role. Negative phototaxis has a minor effect. Adult females lay more eggs on the younger leaves and on the lower leaf surface of some plant species but not others. Leaf hairiness and leaf angle are not significant factors in selection by adults of either 1) younger leaves or 2) the lower leaf surface nor are they significant factors in the number of eggs/female/day laid on either 1) leaves of different ages or 2) the lower or upper leaf surfaces.

Adult survival on sucrose sachets (aqueous sucrose solution sandwiched between two layers of Nescofilm) was optimum for 15-20% sucrose and eggs/female/day laid on the sucrose sachets was independent of sucrose concentration when it was between 10% and 30%. Eggs/female/day reached a maximum after 2-3 days and thereafter dropped sharply. The number of larvae that hatched was independent of sucrose concentration but higher concentrations appear to induce later hatch. Percent egg hatch varied from 40% to 77%. The number of eggs laid on 20% sucrose sachets in complete darkness was nearly twice that of any other light intensity. There was no graded relationship between light intensity and oviposition. More eggs were laid on 15% sucrose sachets in light/dark regimes of 8/16, 4/20 and 0/24 than of 12/12, 16/8 and 24/0 hours. No diurnal fluctuation in egg-laying occurred nor were more eggs laid in either light or dark periods. The sucrose sachet technique is a suitable tool for further studies on greenhouse whitefly behaviour.

The results provide further information for incorporation into integrated pest management research.

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The final version of this thesis is at last final. The checking has been checked - again. The last mistake been found (or has it?). The protracted process of producing a properly presented thesis is finished. It but remains to acknowledge and thank those who made a contribution towards its completion.

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Greenhouse whiteflies may now rest in peace - on someone else's plants!

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