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AN UPDATE ON SCREENING AS PART OF INSECT AND DISEASE MANAGEMENT IN THE GREENHOUSE

James R. Baker and Ronald K. Jones

This is an update on the article on screening which appeared in the North Carolina Flower Growers' Bulletin Vol. 34, No. 6, 1989. We have continued the demonstrations on screening inspired by Robb and Parrella's (1988) screening experiment in California in which they were able to grow a crop of chrysanthemums without a single application of pesticides. Most of our emphasis has been with the western flower thrips, a vector of the tomato spotted wilt virus, the sweetpotato whitefly and aphids. Details of the 1989 demonstrations are not repeated here although some of the general findings are repeated.

Resistance to pesticides has made control of insect and mite pests increasingly difficult in the greenhouse. In the case of pesticide failure, changing to a pesticide in a different chemical group may help. However, with some pests, such as the western flower thrips, the number of pesticides which are effective and labeled for use in the greenhouse is uncomfortably small. Although pesticides will remain an important tool for pest management in the greenhouse, other methods of control must be used to slow the build up of resistance in order to conserve the usefulness of legally registered pesticides.

Environmental and health problems associated with pesticides have sensitized the public and greenhouse workers to pesticide issues. Because of both dermal and respiratory exposure to pesticides, greenhouse workers have greater risk associated with pesticides than any other group of agricultural workers. An obvious way of reducing risks is to make fewer applications of pesticides by using screening to reduce numbers of pests entering a greenhouse.

Tomato spotted wilt virus was identified in peanuts, tobacco, and tomato in the field of 34 counties in North Carolina during the 1990 growing season! If the virus becomes established in perennial weeds outdoors, then some of the thrips which are sucked into greenhouses in late May and early June and later in August and September may carry the common or lettuce strain of tomato spotted wilt virus in to susceptible floral crops.

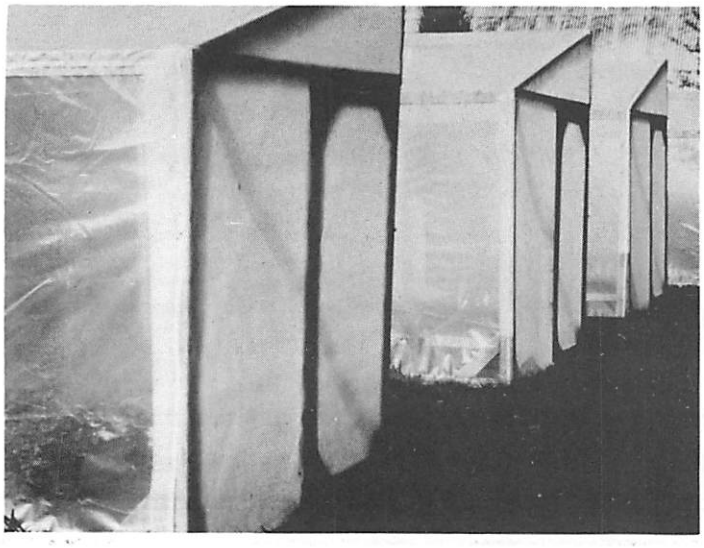

Figure 1. The screened side of the small, experimental greenhouses.

We carried out a number of caged plant demonstrations which showed that the Vispore (400 holes per square inch) and tobacco canvas were very effective in excluding thrips and whiteflies. This agrees with results reported by Mau (Baker, 1988) that a windbreak of trees between fields of lettuce retards the spread of tomato spotted wilt in Hawaii. In other words, some screening is much better than none. However, we also found that pests can be caged IN as well as out, so a grower cannot depend solely upon screening for his entire pest management program.

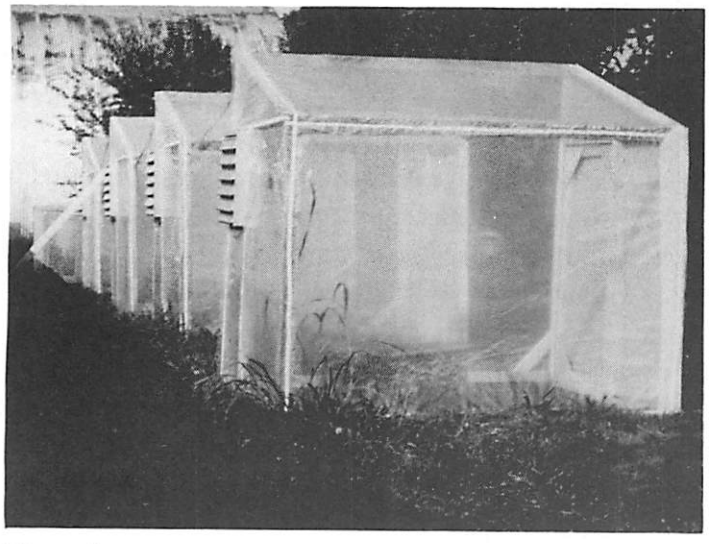

Figure 2. The vented end of the small, experimental greenhouses.

We have screened entire greenhouses at two commercial ranges. The fairly successful results at one were published in our 1989 article. Data are not yet available from the other greenhouse, but at least at both greenhouses, it was demonstrated that it is possible to grow in a screened greenhouse.

In a comparative study, four small, unheated greenhouses were fitted with Vispore (400 and 1600 holes per square inch), Remay (tobacco canvas), and Fly Bar (reinforced polyspun screening) (Fig. 1,2). Each house had an exhaust fan controlled by a thermostat so that as the days warmed up and the insects started flying the houses would be under negative pressure. We used chrysanthemums as our "crop". Using yellow pan traps filled with soapy water, we monitored for thrips and aphids inside and outside the small greenhouses. All of the screening materials were effective in our demonstration at excluding thrips (Fig. 3) and aphids (Fig. 4).

We plan to continue these exclusion experiments in hopes of formulating effective, convenient and affordable screening techniques to augment other pest management procedures for greenhouse ornamentals.

Literature Cited

Baker, J.R. 1988. Sixth ornamental workshop, October 1988. North Carolina Flower Growers' Bul. 33(6): 1–6.

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Robb, K.L. and M.P. Parrella. 1988. Chemical and non-chemical control of western flower thrips. Proc. Fourth Conf. on Insect and Disease Management on Ornamentals. 94–103.

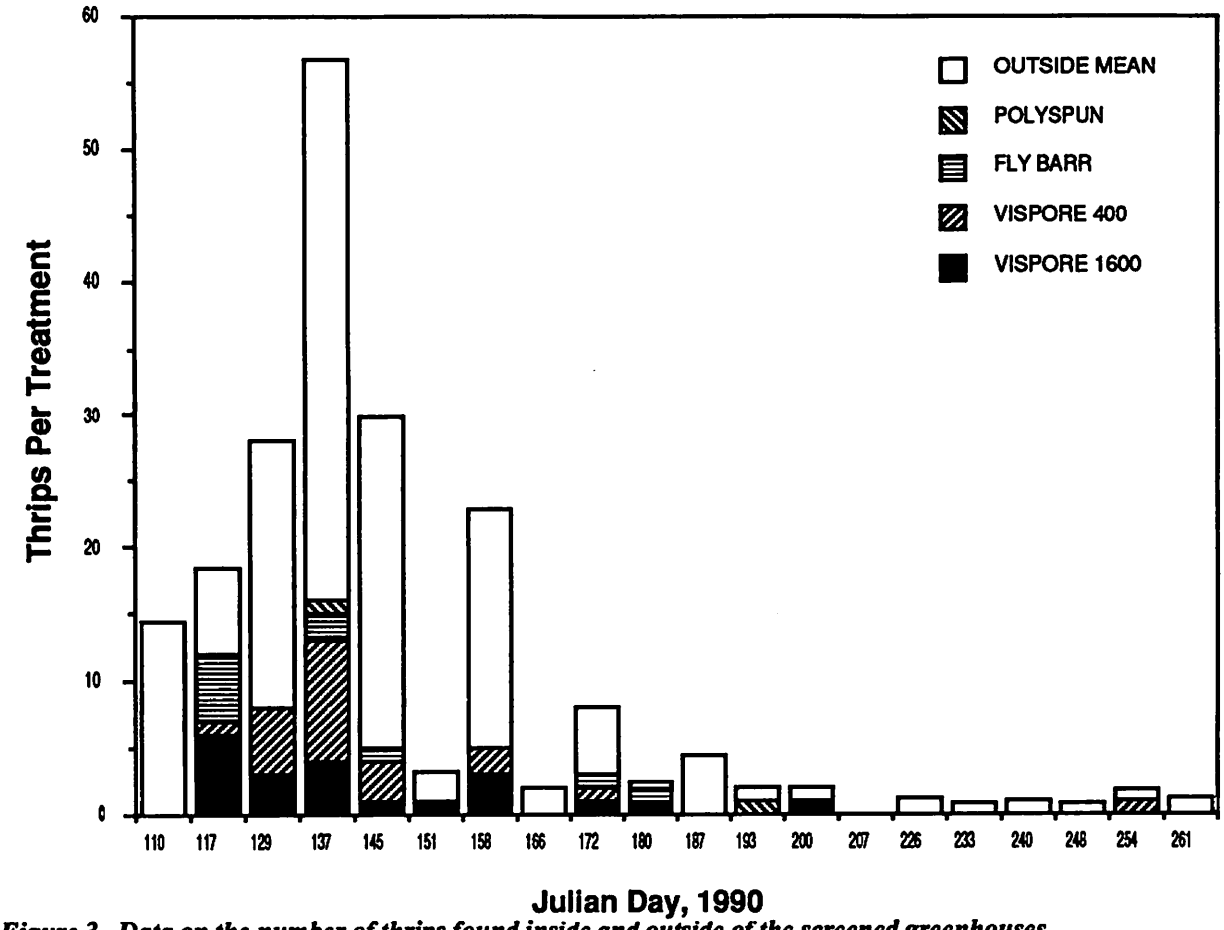

Figure 3. Data on the number of thrips found inside and outside of the screened greenhouses.

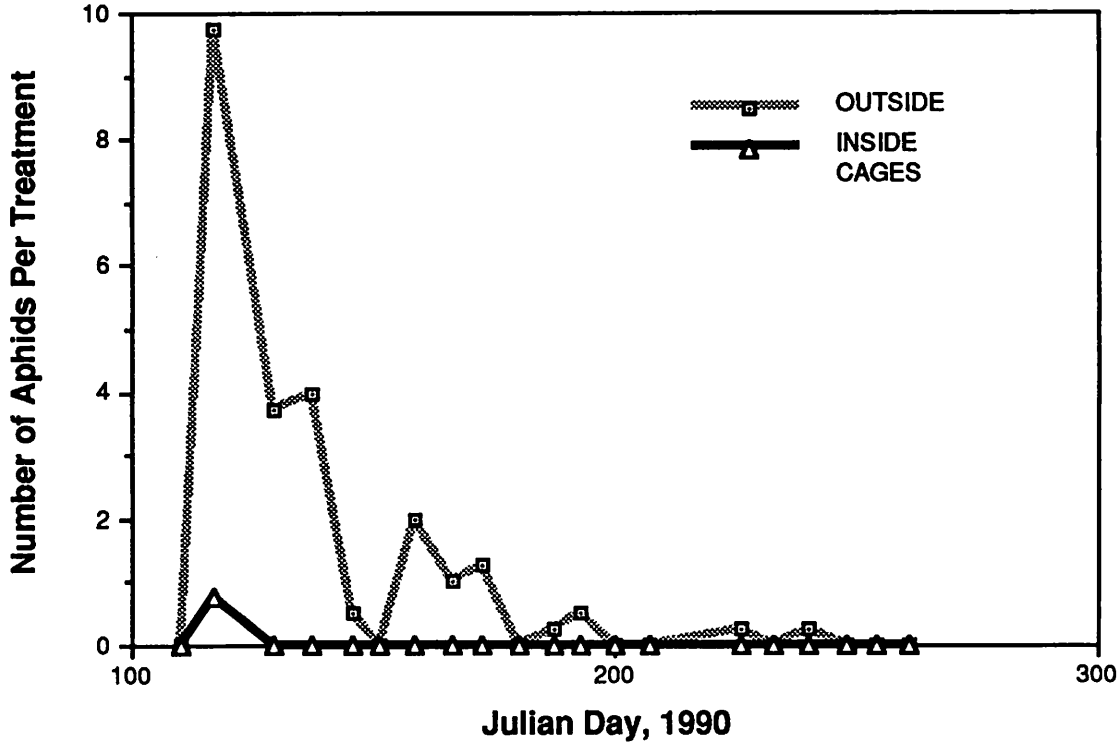

Figure 4. Data on the number of aphids found inside and outside of the screened greenhouses. The number of aphids found inside the greenhouses was so small, the data were pooled to make the numbers show more clearly.