

STUDIES ON THE EFFICACY AND DURABILITY OF AZADIRACHTIN SPRAYS ON
COTTON AGAINST HELIOTHIS ARMIGERA

Chang Sheng Zhen and Martin Rice
Department of Entomology, University of Queensland
Queensland 4072

It is already well established that sprays containing the ultra-safe pesticide azadirachtin are very effective in reducing egg-laying Heliothis spp. in cotton in the field (Pyke et al. 1987; Rice 1990). Laboratory studies have shown that it is also highly effective against Heliothis larvae (Rice, Lin and Ladaha 1987 internal reports). Field trials against the same pest on sweet corn have shown that, at a concentration of 400ppm, azadirachtin is able to achieve better field control of Heliothis damage than any of the commercial toxic pesticide standards (Hargroves 1989 - reported in Rice 1990). The function of the current work is to determine the mode of action of azadirachtin against Heliothis armigera and to test various formulations, under simulated field aging conditions. This work will enable us to determine which formulations are most efficacious and have greater durability on cotton in the field.

Using cotton plants exposed to increasing numbers of days of sunshine the following survival percentages of larvae were obtained:-

<u>Treatment (basic formula)</u>	<u>% larvae surviving 1 week</u>
No spray:	86%
1 day sun aged spray (250ppm azadirachtin)	19%
2 days sun aged	37%
3 days sun aged	38%
4 days sun-aged	48%
6 days sun-aged	44%

By the use of simple additives to the formulation, it has thus been improved to a considerable extent. So that exposure to sunlight for 6 days has much less degrading effect on azadirachtin activity. For example:

<u>Treatment (simple additive formula)</u>	<u>Weight of larvae at 1 week</u>
No spray:	100%
1 day sun aged spray (250ppm azadirachtin)	12%
2 days sun aged	15%
3 days sun aged	17%
4 days sun-aged	21%
6 days sun-aged	26%

The larvae which survived ate very much less, grew very slowly, were small and sluggish in movement. It is likely that they will be particularly susceptible to predators, parasites and pathogens. Further work is continuing on the mode of action of azadirachtin and on more sophisticated formulations to extend its durability and efficacy on cotton leaves.

We thank Queensland Cotton Ltd. for their financial support and encouragement.

Pyle E., Rice M., Sabine B and Zalucki M. (1987) Australian Cotton Grower 8(2): 7-9. Rice M.J. (1990) Acres Australia 1(3): 36-40