

The effect of food sprays on pest populations

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Food sprays have been used to attract, conserve and build up natural enemies of agricultural pests. But using food sprays above the optimum rate may have adverse effect by encouraging some pests, particularly *Helicoverpa* into the crop to lay. So growers should use food sprays only at the rate that will attract beneficial insects but not encourage pests.

During the 2000–02 cotton seasons the impact of all the commercially available food sprays on pests was studied.

It is known that insects in general like sugar — they use sugar to generate energy to lay eggs. We found some of the food spray products, particularly the sugar-based ones, may increase *Helicoverpa* egg lay depending on the rate of application used.

Oviposition experiment 1

Trials were conducted in commercial cotton crops at Auscott Narrabri in the early part of the 2000–01 season. The study evaluated the effect of food sprays on densities of *Helicoverpa* spp. in cotton. Food spray products used were Envirofeast, PredFeed and AminoFeed at recommended rates.

Each food spray was applied four times at approximately seven to 10 day intervals. These treatments were compared with 'conventional' cotton sprayed with NPV and Bt.

Significantly higher numbers of eggs per metre were recorded on crops treated with AminoFeed compared with the other food sprays. The number of larvae were not significantly different among food sprayed plots, but were significantly lower than numbers recorded on the conventional NPV and Bt plots.

Oviposition experiment 2

Following the results of experiment 1, a 'free choice' study was conducted in December 2000. One hundred mated *Helicoverpa armigera* females were introduced in the mesh house at ACRI to lay on potted cotton plants treated with AminoFeed, AminoFeed UV, Mobait, Predfeed, Envirofeast and sugar solution. The number of eggs per plant was assessed for each treatment and compared to unsprayed cotton.

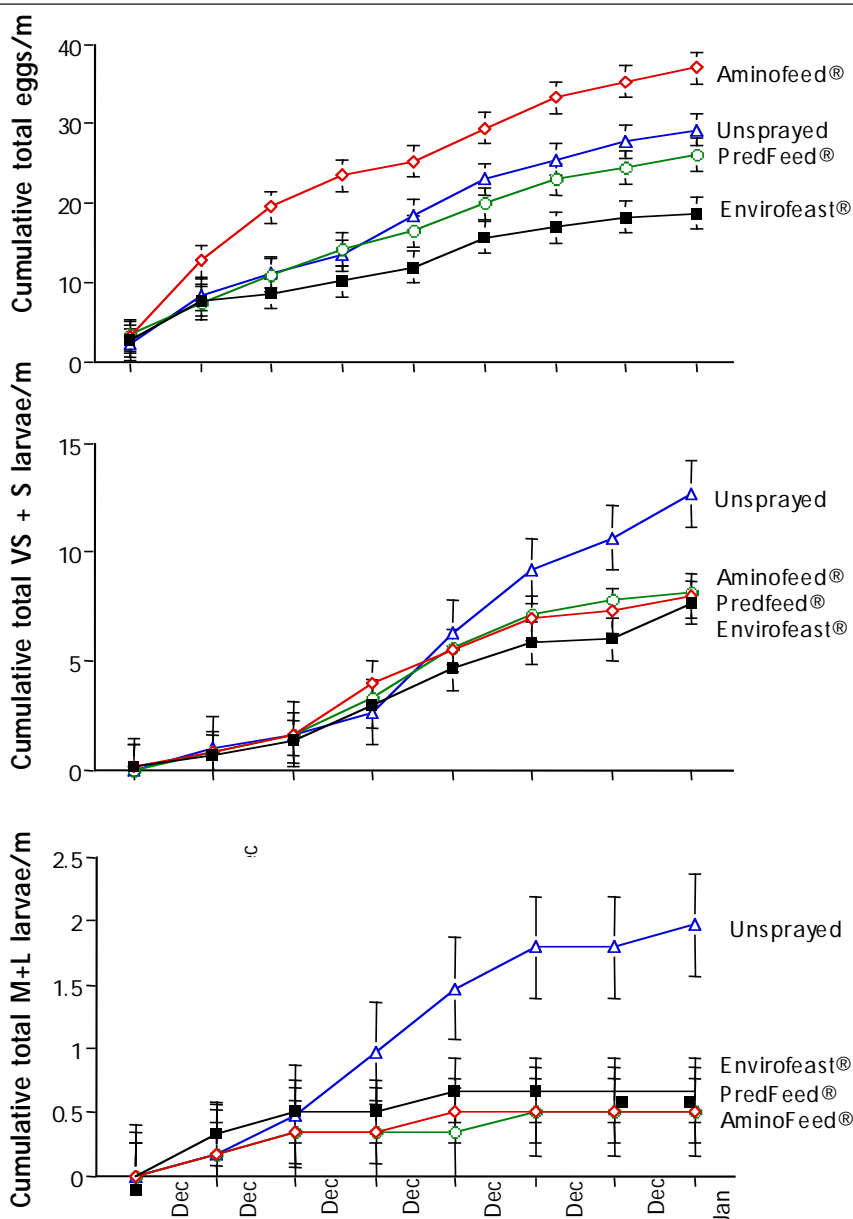
Plants treated with sugar solution had the highest number of eggs per plant. This was followed by plants treated with AminoFeed, AminoFeed UV and Mobait. The unsprayed plants and plants treated with Predfeed and Envirofeast had the lowest number of eggs per plant.

Oviposition experiment 3

Following the results of the mesh house study, the sugar-based food sprays (AminoFeed and Mobait) were selected for a further 'free choice' trial. In this study potted cotton plants were treated with AminoFeed, Mobait and molasses. One hundred mated *H. armigera* females were released in the mesh house and the num-

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FIGURE 1: Cumulative number of *Helicoverpa* eggs, very small and small (VS + S) and medium and large (M+L) larvae per metre on commercial cotton crops at Auscott Narrabri (2000–01 season)



ber of eggs per plant were recorded and compared to the control (water-treated plants).

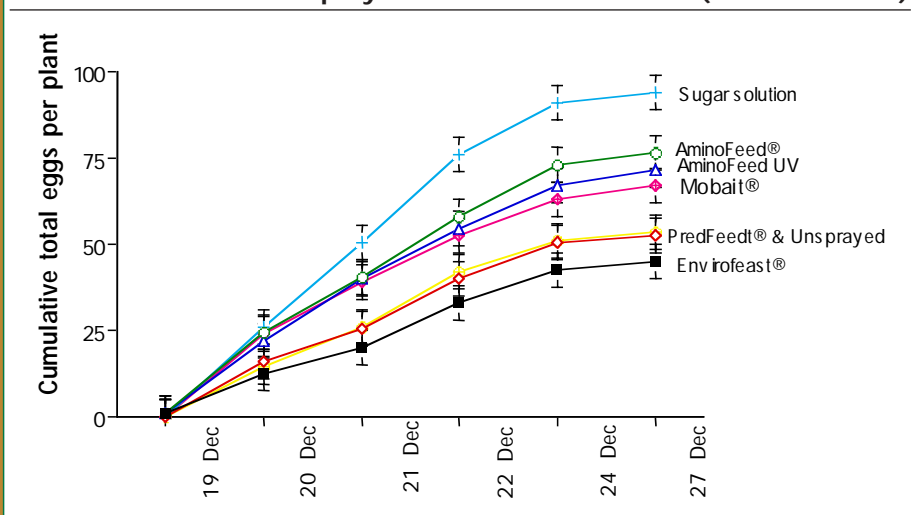
A higher number of eggs per plant were found on plants treated with Aminofeed, Mobait and molasses compared to plants treated with water.

Oviposition experiment 4

Following the results of experiment 3, a new study was conducted to determine the optimum rate of Aminofeed so *Helicoverpa* egg lay on the plant will be the same as unsprayed cotton plants. In this study, Aminofeed was applied at 3.0, 2.0 and 1.0 litres per hectare to potted cotton plants in the mesh house. One hundred mated *H. armigera* females were released in the mesh house to lay on the treated plants.

Plants treated with Aminofeed at 2.0 and 3.0 litres per hectare had significantly higher eggs per plant than plants treated with Aminofeed at 1.0 litre per hectare. Additionally, the number of eggs per plant recorded on plants treated with 1.0 litre per hectare of Aminofeed was not significantly different from plants treated with water.

FIGURE 2: Cumulative number of *Helicoverpa* eggs per metre on cotton treated with food sprays in the ACRA mesh house (December 2000)



Oviposition experiment 5

To confirm the results of the earlier field trial at Auscott Narrabri, an experiment was conducted at Norwood near Moree on Ingard cotton crops from mid November 2001 to mid January 2002. This was the period the Ingard crops were fully expressing the Bt toxin.

The food spray products evaluated were Aminofeed, Predfeed, Envirofeast, Mobait and an unsprayed control. The number of eggs per metre was recorded on each treatment and control plots every seven days.

The number of *Helicoverpa* eggs per metre on each sample date were significantly lower on Predfeed and Envirofeast treated plots than Aminofeed, Mobait and unsprayed plots.

The number of eggs per metre recorded on the Aminofeed and

Mobait treated plots were significantly higher (by 50 per cent than the control (unsprayed) plots). This confirms that these products may be increasing egg lay on the crops when used at recommended rates.

DISCUSSION

Sugar-based food sprays should be used if the farm already has enough beneficial insects and the objective is to keep them there. Sugar-based food sprays can also be used as feeding stimulants to encourage larvae to eat more. But when using these products, caution should be taken to apply the optimum rate that will not encourage pests such as *Helicoverpa* moths to lay more on the crop.

In particular, Aminofeed can increase *Helicoverpa* egg lay if applied at the recommended beneficial attractant rate of 3.0 litres per hectare. The optimum rate of application of Aminofeed is 1.0 litre per hectare. This rate is not the recommended beneficial attractant rate on the product label.

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Part three of this series — the effect of food sprays on predator populations — will be published in the next issue.

TABLE 1: Food spray products used in experiments

Aminofeed	3 L/ha
Aminofeed UV	3 L/ha
Envirofeast	2.5 kg/ha
Predfeed	2.5 kg/ha
Mobait	0.5 L/ha
Sugar solution	2 kg/ha
Molasses	3 L/ha

Note: Different rates of Aminofeed were used in experiment 4.