

# **MEDIA RELEASE**

## **APHIDS USE NATURE TO BEAT CHEMICALS**

Over the past 6 years cotton aphids have shown increasing resistance to key insecticides used for their control. A question puzzling researchers was how aphids survived through winter, from one cotton season to the next. This must occur if resistance is to carry over between years. A paper presented to the 2006 Cotton Conference on the Gold Coast shows that aphids use a wide range of different hosts during spring, summer, autumn and winter.

Some clones of cotton aphid have developed resistance to organophosphates and pirimicarb, though there are some clones that are still susceptible. If resistant aphids are allowed to over-winter on farms it will increase the chance that aphid populations encountered in the next season will also be resistant. Eliminating aphid hosts will reduce resistant aphid survival and so increase the chance that aphids that enter the farm subsequently may be susceptible.

The study found that good rainfall over winter encourages growth of host material for cotton aphids. Winter rainfall can also contribute to higher abundance on young cotton and the risk of faster population growth, particularly if beneficial populations are disrupted with broad-spectrum insecticides. Aphids removed from weeds, such as deadnettle, fierce thornapple, beggar'sbeggars ticks, bladder ketmia and caltrops showed insecticide resistance, reinforcing that weed hosts may be important in maintenance of resistant aphid populations. Without hosts the aphids have no food source and will not survive.

But what happens in drought years, where there are hardly any winter crops or weeds? The researchers found that samples collected from plants in farm gardens and from some town backyards during the study period often showed high levels of insecticide resistance to insecticides used to control aphids in cotton. Aphids are flying between cotton, farm gardens, weeds and native species as a means of surviving, allowing the persistence of insecticide resistant populations.

Putting these outcomes together emphasises the importance of good farm hygiene to reduce the availability of winter hosts for aphids, and for care in selecting rotation crops to avoid those preferred by cotton aphid. Some rotation crops are useful such as lucerne, vetch or canola, because cotton aphids will not survive on these through winter.

The study noted that control of over-winter hosts is particularly important if the aphids are resistant. Under Australian conditions cotton aphids reproduce asexually, with adult female aphids giving birth to live young. As such there is no mating, so there is no opportunity for dilution of resistance by matings between susceptible and resistant individuals (as there is for instance with *Helicoverpa armigera*).

In years where rainfall promotes growth of weeds on farm, and the over-winter survival of aphids is likely to be higher, it will be important to select rotation crops carefully, control the weeds to reduce the over-winter survival of resistant clones and ensure good sampling of young cotton crops to monitor the

abundance of aphids. A quick biochemical test to establish if aphids are resistant to pirimicarb is available, and can help in selecting insecticides if control is required..

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