Roger Adams from Darling Downs Fresh Eggs

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Contents

HEALTH FEATURE

A new product to beat Litter Beetle

By WARWICK MADDEN, Further Research & Consulting. www.further.net.au

Litter beetle (*Alphitobius diaperinus*) is a common pest of broiler sheds in much of Australia especially in sheds with earthen floors.

As a matter of course sheds are normally treated for litter beetle after clean-out and sanitising. Litter beetles are well known as vectors of various poultry diseases so it is imperative that they be controlled.

Tapeworm in particular can be a problem in Australian chickens and litter beetle larvae are the most likely vector. In addition, litter beetles are also known to damage insulation in sheds, reducing its effectiveness.

Traditionally sheds were sprayed after clean out using fenitrothion. Fenitrothion, an organophosphate chemical, was used for many years and over time resistance built up rendering it less effective.

In addition, worker safety issues became a growing concern with the move away from organophosphate and carbamate chemicals in the 1990s.

The introduction of a cyfluthrin wettable powder formulation (Tugon WP, now known as Prolong) in the late 90s saw a major move away from the old chemistry. Cyfluthrin is a synthetic pyrethroid, a class of chemicals noted for its fast knockdown, quick kill and relatively low mammalian toxicity. Tugon/Prolong became the product of choice for the control of litter beetle in broiler sheds.

Cyfluthrin use became widespread and with few alternatives being used it was inevitable that some resistance in beetle populations would occur.

Lambkin and Rice (2006) noted resistance to cyfluthrin in litter beetle populations in broiler sheds in south east Queensland as early as 2001. In the study it appeared that the level of resistance was related to the number of cyfluthrin applications.

Betacyfluthrin was developed as a second generation pyrethroid by Bayer. Cyfluthrin is made up of four different isomers, or forms, of the active ingredient. Studies showed that two of these isomers had very much reduced insecticidal activity and were removed from the formulation creating betacyfluthrin.

One of the first crops it was used in was cotton where there was a high level of pyrethroid resistance in the cotton bollworm (*Helicoverpa armigera*).

Betacyfluthrin was one of the few products to show improved control of resistant populations.

A study by Tomberlin *et al* (2008) showed high resistance levels in litter beetles in the USA to first generation pyrethroid, permethrin.

However they showed vastly improved control using betacyfluthrin and another newer generation pyrethroid. This would indicate that the newer pyrethroids are effective in suppressing resistant populations of litter beetle.

A trial using new BeetleBETA SC (betacyfluthrin 125g/L) insecticide was carried out on a broiler farm in western Sydney to generate registration data.

BeetleBETA has been developed by Sundew Solutions Pty Ltd, a new R&D based pest control technology company.

In the trial, three earthen floor broiler sheds with high populations of litter beetles were divided in two. Before spraying, litter had been removed and the sheds had been sanitised. Pre-treatment beetle counts were taken when the previous broilers were still present not long before their removal.

Half of each shed was sprayed with BeetleBETA (80mL per 50L) and the other half with Prolong 10 WP (100g per 50L).

The application rate for both products was 10L of spray per 100 m2.

Spray was applied to all floor areas plus one metre up the wall of the sheds on all sides. Where the two treatments merged in the middle of the shed a sampling buffer zone was left to avoid potential overlap. No beetle samples were taken from these zones.

The sheds were sampled regularly for beetles and larvae. Four sampling positions were established and marked out in each replicate.

A 100mL scoop of litter was taken from each position along the feeder line. Samples were taken at the end of the previous batch then at 2, 3, 5, 6 and 7 weeks covering the whole cycle.

The numbers of live beetles and larvae were counted manually in the laboratory within 24 hours of each sampling. Larvae less than 10mm long were not counted.

Results

The results were statistically analysed by Dr John Rogers of Research Connections and Consulting (RCAC). The results indicated that BeetleBETA was more efficacious than Prolong especially against litter beetle larvae.

This is shown clearly in the chart. Numbers of adult beetles in both treatments remained relatively low throughout.

A distinct peak in larvae numbers can be seen at six weeks for Prolong. Larvae numbers appear to drop at seven weeks probably due to pupation. Larvae numbers for BeetleBETA remained low throughout.

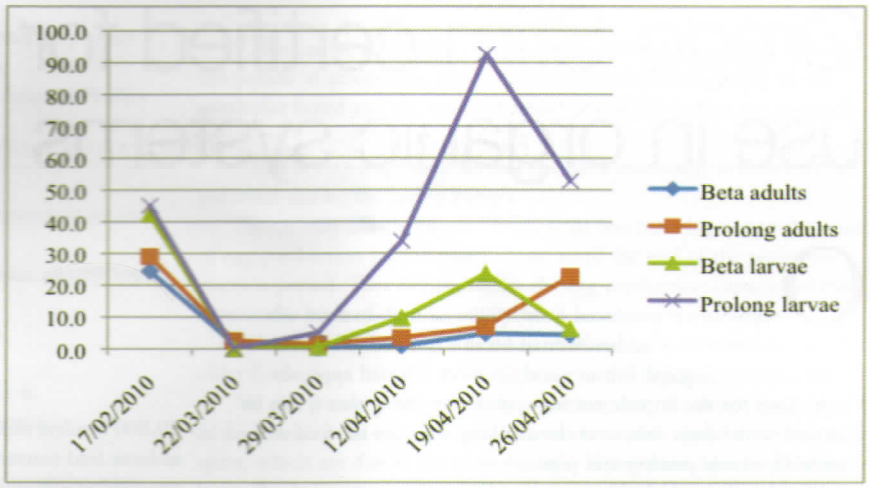

Chart: the average number of litter beetle adults and larvae per treatment at each sampling date. Treatment was carried out on 01/03/10.

The grower commented that the product was easy to measure and mix, being a liquid rather than a wettable powder. He also noticed higher numbers of dead beetles in the BeetleBETA treated plots of the sheds.

BeetleBETA was recently registered (under the name MaxumPRO 125 SC) by the APVMA for the control of litter beetle along with a range of other general pests such as spiders, ants and cockroaches. The product, in 1L measure packs, will be available through poultry distribution channels in August 2011.

BeetleBETA offers growers an effective litter beetle management tool alternative. For more information contact Sundew Solutions on 1800 786 339 or email info@sundewsolutions.com.au for pre-launch commercial trial samples. Visit the website at www.sundewsolutions.com.au

References

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