



LONG DISTANCE INSECTS RAISE THE HYGIENE BAR

New insights into the ecology of three major insect pests of stored grain have implications for farm hygiene practices

By Dr Greg Daglish, Dr Andrew Ridley and Philip Burrill

THE LESSER GRAIN borer (*Rhyzopertha dominica*), red flour beetle (*Tribolium castaneum*) and rusty grain beetle (*Cryptolestes ferrugineus*) are among the most common pests on farms; however, not much is known about how and when they travel through cropping areas.

A lack of relevant information on the ecology of these pests prompted a national research effort coordinated by the Queensland Department of

Flying beetles can infest grain located at least 2km away, so burn or bury waste grain.

Agriculture and Fisheries (DAF) and supported by the Plant Biosecurity Cooperative Research Centre, of which the GRDC is a partner.

Trapping studies show these beetles fly more than was previously thought.

All three species have been trapped away from stored grain, sometimes more than 10 kilometres from the nearest farms. This means that beetles resistant to the fumigant phosphine or grain protectant insecticides can fly between farms.

Flying beetles pose a threat for much of the year, highlighting the need to minimise the chances of infestation by eliminating places to breed. These beetles are long-lived and females can produce many offspring in small amounts of grain.

There is strong seasonality in flight activity, with little or no flight occurring during the coldest months of the year. Limited flight during these months provides an opportunity for growers to get on top of infestations early. By undertaking their main storage facility clean-up during winter, growers can eliminate residual populations before rapid breeding and flight activity gets underway in spring.

Another study investigated the risk of newly harvested grain becoming infested on farms. The study showed that when there is an existing infestation in nearby silos, the risk of infestation is greatly increased. The risk is low on farms with no detectable infestations, emphasising the importance of managing pests in all storage areas.

Grain located 2km from farm silos was also at risk of infestation, but much less so than facilities located close to farm silos (especially infested silos).

The fact that flying beetles are not limited to the immediate storage environment and can infest grain located at least 2km away has implications for disposal of waste grain.

It is common practice for many growers to dump badly infested grain by the road near their properties. The results of the field studies show that there may be no safe distance from farm silos to dump waste grain.

Although the risk of infestation from waste grain will be reduced with distance, the safest option will be to bury or burn the waste to reduce the risk to nil. □

GRDC Research Code NPB00013

Plant Biosecurity CRC Codes 3039, 50089, 50149

More information: Dr Greg Daglish, greg.daglish@daf.qld.gov.au;

Dr Andrew Ridley, andrew.ridley@daf.qld.gov.au;

Philip Burrill, philip.burrill@daf.qld.gov.au;

Queensland DAF, 13 25 23, www.daf.qld.gov.au

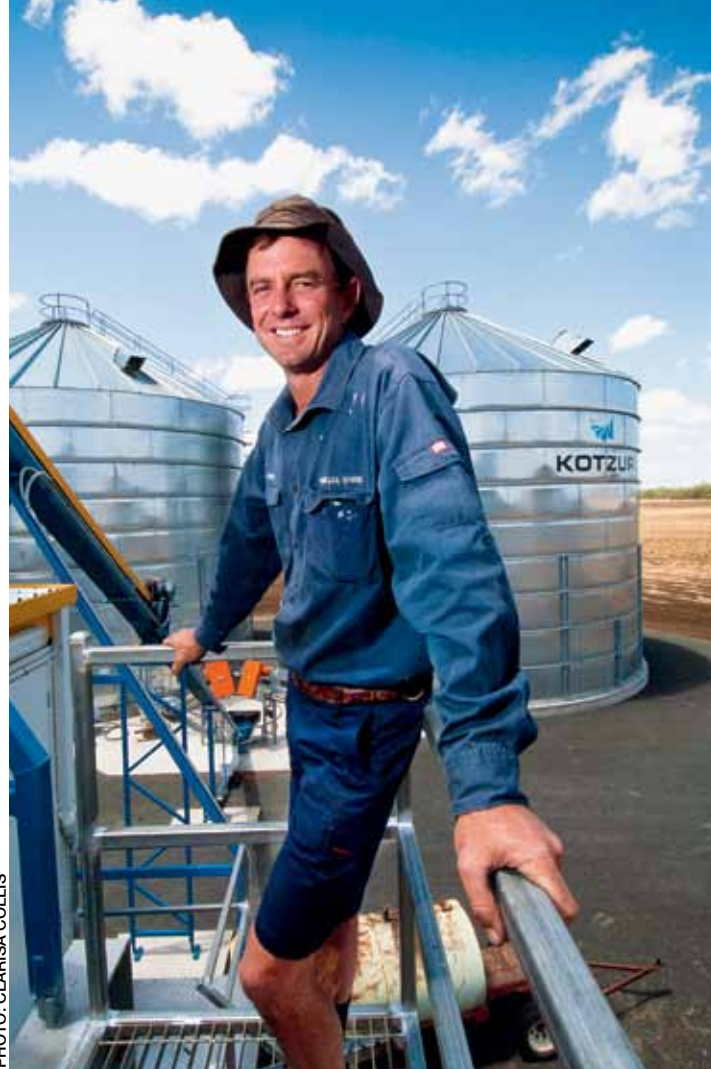


PHOTO: CLARISA COLLIS

Storage hygiene clips flying pests

Central Queensland growers Phillip (pictured) and Janelle Otto completed a new grain-handling system for their Clermont cropping operation in 2013, and the investment is paying off.

Their system includes 3000-tonne storage capacity plus a certified weighbridge with a 38t elevated quick-fill silo.

Phillip says the ability to sell all their grain ex-farm has reduced costs by \$10/t in cartage costs to the local depot, \$2.50/t a month in warehousing fees and \$16/t on the depot's in-and-out fees.

The Ottos' grain marketing is underpinned by storage hygiene. Phillip ensures all spilled grain is cleaned up from the ground and he spends time ensuring his harvester, chaser bins and mother bins are clean. The Ottos have also invested in aeration cooling and an automatic controller to prevent insects infesting storage.

The Ottos' 2800-hectare property was one of 10 Central Queensland enterprises involved in a Plant Biosecurity Cooperative Research Centre insect ecology research project run by Dr Greg Daglish, who is a principal research scientist with the post-harvest grain protection team at the Queensland Department of Agriculture and Fisheries.

Phillip says the research, which measured how far storage pest species can fly to infest clean grain and the times of year they are active, reinforced the need for best-practice grain hygiene as it showed that insects such as flying beetles are not limited to the immediate storage environment and can infest grain located at least two kilometres away.