# THE NORTHERN TABLELANDS DUNG BEETLE EXPRESS

WINTER, 2006

## AND THE WINNERS ARE …….

All of you who completed the Buffalo Fly Survey! From your responses we have uncovered some interesting information which improves our understanding of the problem and the most popular solutions.

Eighty three percent of landholders who responded have experienced buffalo fly in problem numbers. The respondents' properties were located from Tenterfield to Wollomombi and west to Wallangra and it appears buffalo fly are widespread and becoming more prevalent. Most respondents said that the fly arrived between November and January, departing in April/May or after the first big frost. While some landholders said that buffalo fly had been present for between 3 and 10 years, others had only noticed them over the past 2 years.

Of those surveyed most said that they did not treat for buffalo fly at all. Those that did generally waited until they had a set number of flies ranging from 100 to 200 per beast. Control measures included the natural (buffalo fly traps) and the chemical. We were pleased to note that most producers using chemical methods were using back rubbers or ear tags which are generally considered to have less impact on dung fauna than other chemical control methods.

So, with the great dung beetle season we had this year, why were buffalo fly causing so much concern? Experts including Dr. Angus Macqueen and Lex Turner suggest that a combination of factors could be responsible. These include climatic conditions (ie prolonged dry periods or a dry spring, followed by a wet summer) which favour the buffalo fly and not the dung beetles. It should be remembered that although dung beetles do play a role in reducing buffalo fly numbers gaps in activity periods still allow buffalo fly to thrive under certain conditions. Dung beetles are not the total solution but should be regarded as an important part of an integrated fly management program.

Some producers were using "natural" (commercially available and/or home made) products in the hope that these alternative treatments might be less damaging to their dung beetle populations. While we are heartened that producers are considering their dung beetles, after consultation with DPI and RLPB staff, we felt it advisable to add a cautionary note. Natural or organic does not always mean "harmless". Nature produces some fairly strong toxins including arsenic and strychnine, indeed many commercially produced parasiticides are derived from naturally occurring substances.

If you are intending to use an alternative treatment it is advisable to contact a regulatory body to ensure that none of the ingredients in your product are likely to cause residue issues. As to the toxicity of treatments and their affect on dung beetle populations - assumptions and educated guesses can be made but the products really should be tested as we already have enough which have a negative impact on dung fauna without creating more.

More research into buffalo fly control products needed!

**Inside this issue**



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**Buffalo Fly Control**

- Tolerate a reasonable fly burden (200 per beast)
- Cull highly sensitive cattle
- Consider buffalo fly traps
- Ear tags and back rubbers deliver less chemical reducing the risk to dung fauna
- Manage your property to optimise dung beetle numbers
- Exercise caution with all products

# KEY TO THE EXPERTS

*In the Spring issue we featured Dr. Penny Edwards who is a valuable member of the Orica sponsored project "Dung Beetles for Landcare Farming". This issue we are pleased to feature another member of the committee, Keith Wardhaugh, who continues to make an enormous contribution to dung beetle issues despite his "retirement".*

My early years as a researcher were spent with the Anti-Locust Research Centre based in London. My main responsibility was to devise a way of predicting the durations of egg development in the Desert Locust, a major pest of agriculture in Africa, the Middle East and the Indian sub-continent. Such information was needed to increase the efficacy of control operations and involved prolonged periods of field work in India, Pakistan and Saudi Arabia. The work was successful and led to my transfer to Australia to undertake similar studies on the Australian Plague Locust. Initially, I was based at the Trangie Agricultural Research Station, where I chanced on the discovery that locust eggs possessed a highly specialized mechanism called diapause. Because diapause sychronised the insect's seasonal development and enhanced its chances of survival over winter, it was important to understand the environmental cues that initiated and terminated this condition. Without this knowledge, accurate predictions of egg hatch would not have been possible.

Towards the end of my locust work I was offered a position in CSIRO Plant Industry. I moved to Narrabri in 1974 and joined a newly-formed team of plant breeders, agronomists and entomologists, whose goal was to develop a system of growing cotton that placed minimal reliance on the use of pesticides. In 1978, I transferred to CSIRO Entomology and moved to Canberra to work on the diapause mechanism of an important veterinary pest, the Australian Sheep Blowfly. During this time, I developed a special interest in the factors that regulate fly strike in sheep, a topic that became one of my main areas of research until my retirement in 1995. I am still actively involved with blowfly research and, at the behest of Australian Wool Innovation, I recently returned to the work force to assist with the development of a computer simulation model intended to predict the prevalence of fly strike on the basis of readily available weather data.

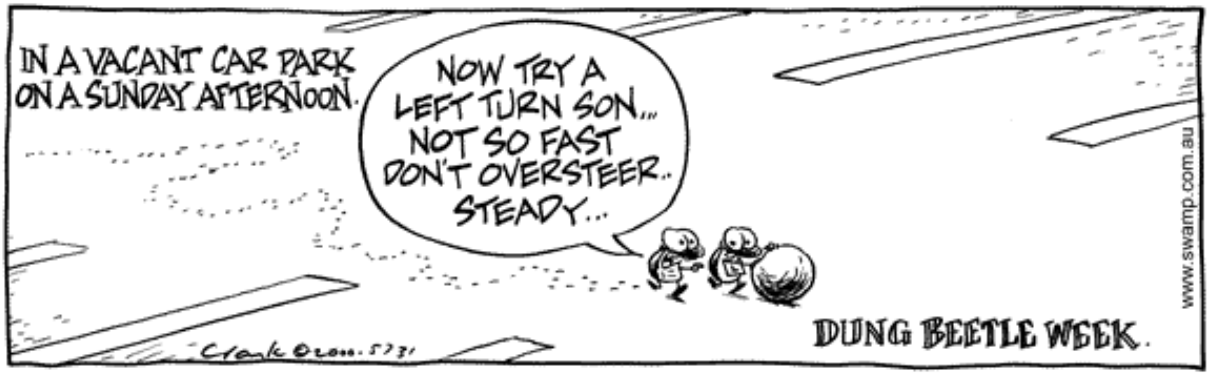
Because of my interest in the phenomenon of diapause, I also became involved in dung beetle research. Three species of beetle that had been selected for introduction into the Mediterranean climate areas of Western Australia (e.g. *Onitis belial, Copris hispanus* and *Bubas bison*) had been found to be difficult to breed because of their complex life-cycle, which was thought to include a period of diapause. Accordingly, during the mid-1980s, I moved to Spain to devise methods of breeding these insects in captivity. During this time I became aware of the need to develop new ways of importing beetles into Australia. Previously, introductions depended on the importation of beetle eggs, which were surface-sterilised in formalin prior to dispatch. Although highly successful, egg harvesting is highly labour intensive and requires access to relatively sophisticated laboratory facilities in the country of origin. It was therefore expensive. Thus, for the West Australian project, the Australian Quarantine Inspection Service was persuaded to allow the importation of adult insects so that egg harvesting could occur in Australia. This reduced the need for research personnel to spend long periods abroad and had the added advantage that adult beetles survived air travel better than beetle eggs. This pilot study, which was conducted in the Australian Animal Health Laboratory in Geelong, worked well and will provide a blue print for future importations.

My work in Spain coincided with a global revolution in the chemical control of livestock parasites and fostered my interest in documenting the impact of veterinary chemicals on the dung fauna. Many antiparasiticides introduced in the 1970s and 1980s (e.g. synthetic pyrethroids, avermectins and insect growth regulators) were excreted in faeces rather urine and often as unaltered drug. This meant that the dung of treated livestock could be toxic to dung feeding organisms for days or weeks after drug treatment. Such developments, coupled with new methods of drug formulation that were designed to extend the period of parasite protection (e.g. pour-ons, or sustained-release capsules) seemed likely to pose a threat to the success of Australia's dung beetle program which, in terms of species establishment, was then still in its infancy. Over the years since my first study on the effects of ivermectin in Spain in 1986 I have

published over 30 papers and reviews on veterinary drugs and am a founder member of DOTTS (Dung Organism Toxicity Testing Standardisation). DOTTS was first set up in 2002 and its aim is to develop standardised protocols for testing the impact of excreted chemical residues on the dung fauna. DOTTS is now a world wide organisation, involving scientists in many countries in Europe, North and South America, Africa and Australasia. An international testing program is now underway and if the experimental protocols provide repeatable results, these protocols will be adopted by Industry for the purposes of drug registration.

Although I am no longer attached to CSIRO, I still keep abreast of the veterinary chemical debate and would be happy to respond to any queries in this area of research.

## SWAMP




# I WANNA KNOW IF YOU'VE EVER .....

seen the rain? Certainly not near Toowoomba lately! While we hate to be self focused our job is to harvest beetles and the persistent dry conditions resulted in a greatly reduced *Onitis caffer* recovery this season. We did harvest enough beetles for two releases but this was well below our target figure.

Still, we are getting there and if these colonies establish successfully everyone is a little bit closer to having a species which works well in the cooler months. The colonies were harvested as part of the "Dung Beetles for Landcare Farming" project which is supported by the Orica Community Foundation. One colony of beetles was released at the Summit and the other at Colinton.

The Northern Tablelands Dung Beetle Express has now harvested 22 colonies of *Onitis caffer*, with 15 of these released within the project area. Other releases were made on properties close to the harvest site in the hope that these beetles would establish thus providing future harvest sites. Some colonies from the 2004 harvest were sold to other Landcare groups to partially cover costs involved.

While the species is touted as a "winter active" beetle this is not supported by data from the Queensland Dung Beetle project which recorded activity as beginning in March and being most abundant between April and June, with no beetles recovered from August to February. Obviously any beetle that works in late autumn, early winter is a valuable addition to existing dung beetle communities but the search for a truly "winter active" species continues.

John Feehan has been harvesting and releasing *Bubas bison* over the past few years. This species appears to become active in late May and is well established in areas of Western Australia. Valued for its rapid dung burial this beetle could be worthy of serious consideration by those seeking to extend the dung beetle activity period on their properties. While it is considered to be best suited to a Mediterranean climate one colony was released at Tenterfield in 2004 and a single specimen was recovered last year.

Landowners who have had releases of *Onitis caffer* are reminded of the importance of monitoring over the next few months. Meanwhile, everyone should keep a watch out for dung beetle activity over winter and give the Project Officer a call if activity is occurring.

**Contact the Project Officer:**

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**Glen Innes. NSW 2370**

**Ph: 02 67321200**
**0427686185**
**Fax: 02 67321420**

**Email: dungbeetles@northnet.com.au**

## OUT AND ABOUT

***Winter is no time to hold a dung beetle field day but with a bit of forward planning your group could be having one in Spring. It really isn't that far away. Why not phone the Project Officer today?***

**www.dungbeetles.com.au**

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## YOU DO WHAT?

If you think you have a weird job spare a thought for Karen Chin whose job is so unusual it doesn't even have a title. Karen works with coprolites. Still got no idea? Karen works with fossilised dung otherwise known as a coprolite. According to "Discover" (Vol. 7 No. 6, June 1996) Karen could describe herself as the world's leading Paleoscatologist. In truth she was then the world's only Paleoscatologist.

Karen's work involves analysing fossilised dung in the hope of discovering more about the diets and habits of prehistoric animals. It also helps to determine what plant/animal species were present at the time the scat was formed. Her specimens range from 300 million year old fish faeces to a sloth stool from the last ice age. Unfortunately it is sometimes difficult to determine whether the fossil is dung or some other object.

While working at a duck-billed dinosaur (Maiasaura) nesting ground in Montana Karen noticed the coprolite was similar in shape to cattle dung but much larger. She also discovered some tunnels in the dung which looked like dung beetle tunnels. On showing the fossil to a noted dung beetle expert in Ontario (Bruce Gill) she had confirmation. In the black rock beneath the fossilised dung sand-coloured sediments filled the tunnels. This was evidence of "back filling". Bruce says "Any number of invertebrates can tunnel through dung but only dung beetles fill their tunnels back up".

So what does all this mean? For a start this was proof that the coprolite was in fact a coprolite, not just a pile of fossilised, rotted vegetation. It further showed that the animal that deposited the dung did not bury it but left it where it landed. It was also the first evidence of dinosaur-insect interactions. The discovery was also the first step in developing a picture of the Mesozoic food chain.