

NORTHERN TABLELANDS DUNG BEETLE EXPRESS

Spring, 2005



SHEEP BUSINESS UNCOVERED

As mentioned in the previous newsletter, the Dung Beetle Express has undertaken a new project with the support of Meat and Livestock Australia. This project is looking at several areas which have not been extensively researched and asks a number of questions. The first part of the project seeks to determine whether dung beetles do utilise sheep dung and, if so, what species are involved. We then intend to use a combination of faecal egg counts and larval recovery to investigate any link between dung burial and worm numbers in sheep.

While we would obviously like to show that dung burial decreases worm numbers we have few previous studies to fall back on as very little work has been done on what is a very important issue. If burial does decrease worm numbers then dung beetles could become part of an integrated pest management system for sheep producers.

It has been theorised that dung burial might prolong the viability of worm eggs by protecting them from desiccation and extreme temperature fluctuations. Now, as any good office worker knows, it pays to hide your chocolates. Similarly dung beetles have only two reasons to bury dung - one is for the same reason we hide chocolates (food conservation) and the other is to produce brood balls. While we suspect that the removal of fluid from the pellet as the beetle feeds and the disturbance to the worm egg as the young beetle develops within the pellet or newly constructed brood ball should be sufficient to reduce egg survival we will have to wait until the study has been completed to reach any conclusion.

In the last newsletter we asked for volunteers for the project and I am pleased to say that we have selected our sites and our Co-operators are equipped to begin the trial. We thank past Site Co-operators for not warning newcomers about the commitment required until after the paperwork had been completed! Seven lucky winners were carefully selected and we now have sites at Nullamanna, Mingoola, Deepwater, Dundee, Uralla, Wellingrove and Guyra.

If this makes you feel very envious - don't despair we could still use more Site Monitors for our NLP cattle project. Please contact the Project Officer.



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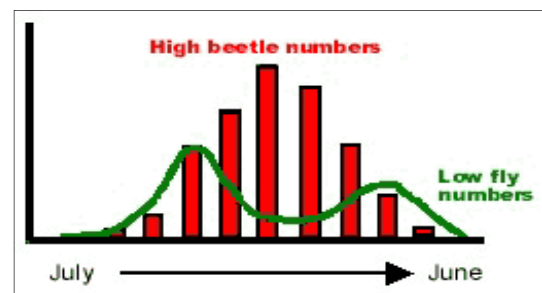
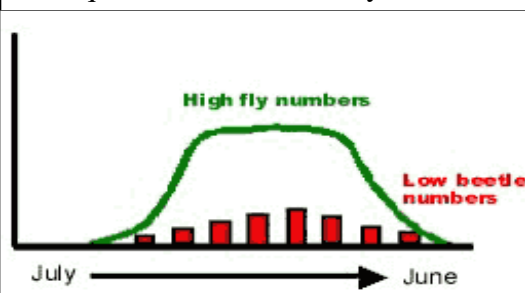
THERE AIN'T NO FLIES ON HIM

Maybe not on him, but it is now Spring and we all know what that brings! Flies, flies and more flies. Let us hope for a good dung beetle Spring (wet and warm) so that the beetles can get a good head start and take control of the situation.

The graphs below don't refer to bush flies but to another pest which is fast becoming a problem to cattle producers on the Northern Tablelands - buffalo fly.

The graphs were taken from a DPI&F note entitled "Dung beetles - controlling parasites of cattle" by David Smith (DPI) and Dr. Angus Macqueen (Retired CSIRO Scientist). The authors suggest that these two graphs show extremes and that the impact of dung beetles on buffalo fly populations is probably somewhere in between.

These graphs were produced using data gathered by CSIRO in Rockhampton during the summer period in the years from 1978 to 1983. The study showed that while dung beetle activity was high during warm wet summers buffalo fly numbers were reduced. Dry summers saw an a decrease in beetle activity and a subsequent rise in buffalo fly numbers.



The study also found that the most suitable climatic conditions for high dung beetle activity in Queensland occurred in areas which had an average rainfall of between 600 - 1000 mm. Activity declined in areas with an annual rainfall exceeding 1200 mm which may be due to mortality of beetle larvae due to high moisture content in the soil during wet seasons.

So, what can you do to maximise your beetle population? Watch what you use to control internal and external parasites and look at alternative buffalo fly control treatments. For further information contact The Project Officer or visit the DPI website www.dpi.qld.gov.au

They said she'd never do it

They were wrong! The Project Officer has finally gotten a life and has run away. Well, perhaps not, but she has decamped temporarily.

Oh - let's just forget this third person stuff which you are supposed to use so that people think you are not bragging.

Spring is here but I am not. Or at least I will not be in early October as I am going to South Africa for 8 weeks. Hurrah!

I have been awarded a Churchill Fellowship and will be spending 2 months studying the effect of grazing management systems on dung beetle populations. The majority of the study will be undertaken in Pretoria under the guidance of Dr. Adrian Davis, however, I will be making a quick diversionary trip to Cape Town to look at some winter rainfall species (and the beach - well you can't really miss a beach can you?)

While I will admit Africa was chosen because I have always wanted to say "I had a farm in Africa" there are some other very good reasons why South Africa and not the south of France.

Firstly, I don't speak French and secondly most of our introduced species were sourced from South Africa. It is therefore logical to assume that any agricultural impacts, negative or positive, will be felt more dramatically in Australia's relatively young introduced dung beetle populations.

I will be studying dung beetle communities in natural and transformed pastures and also looking at the effects of parasiticide use.

In the meantime the day to day activities of the Dung Beetle Express will be handled ably by several people. For advice on who to contact please phone GBLC on 02 67363500 or the Northern New England Rural Lands Protection Board on 02 67321200. The email address remains unchanged.



KEY TO THE EXPERTS

This new section of the newsletter is designed to allow readers to meet some of the people we have been referring to for years. We are pleased to print this informative profile by Dr. Penny Edwards which, very briefly, describes her work and her passion for dung beetles.

I first became involved with dung beetles in 1980, when I joined the CSIRO Dung Beetle Research Unit in Pretoria, South Africa. The Unit had been set up in 1970 by Dr. George Bornemissza with the aim of selecting, collecting and exporting dung beetle species suitable for Australia. My role was to study the ecology and breeding biology of species that were difficult to rear in captivity.

One species I studied in detail was *Onitis caffer*. It was of interest because it is one of the few species in summer-rainfall areas that is active in autumn and early winter. This species has since established well in Australia and is now the subject of an active redistribution program. Another of the species I investigated in South Africa was *Kheper nigroaeneus*, a large ball-rolling species. It is remarkable in that the female rears a single offspring from egg to adult, a level of parental investment unparalleled in the insect world. In spite of this apparently low reproductive rate, survival is good and the species can attain high population levels and remove large amounts of dung very rapidly. Unfortunately it proved impossible to rear this species in the laboratory without the help of the dung beetle mothers, so it could not be introduced into Australia. Much of my research in South Africa was undertaken in the Mkuzi Game Reserve in Natal (Well, someone had to do it)

I returned to Canberra in 1985, where I studied the effect of dung 'quality' on the performance of dung beetles and dung-breeding flies. Although this may sound slightly bizarre, the quality of dung (particularly its nitrogen and water content) has a significant impact on the breeding success and survival of dung-breeding insects. This was important for interpreting the population dynamics and interactions of dung beetles and pest flies, as well as improving rearing techniques of dung beetles.

From 1987 to 1998 I was involved in other areas of research including a project on eucalypt insects and a project on biological control of Bitou Bush and Bridal Creeper. This latter project involved another 5 years in South Africa, based in Cape Town and traveling through much of South Africa (Yes, someone had to do it)

Then from 1998 to 2000 I was based in Darwin doing research on the biological control of the Giant Sensitive Plant, *Mimosa pigra*. This involved frequent field trips to mosquito-infested, croc-infested, muddy, steamy floodplains of the Top End. (I know, but why me)

I left CSIRO at the end of 2000 and became the Technical Co-ordinator of the 2001-2002 Queensland Dung Beetle Project. It was wonderful to return to the world of dung beetles, and to find out which of those species introduced by CSIRO between the late 60s and mid 80s had established, where they had spread to and what impact they were having. It was also exciting to be part of a revival of interest in dung beetles and witness the widespread appreciation and increasing understanding of the benefits of these fascinating creatures.

Contact us:

Pam Wilson,
Project Officer,
Northern Tablelands Dung Beetle
Express,
Northern New England Rural Lands
Protection Board,
P.O. Box 108,
GLEN INNES. NSW 2370

Ph: 0267321200

Fax: 67321420

Mobile: 04276868185

Email: dungbeetles@northnet.com.au

DON'T MISS

13/09/05 - Dung Beetles and internal parasites of sheep. "Lakeview" Uralla. Contact the Project Officer (Pam Wilson) 67321200

26/9/05 - Delungra's Pasture Roadshow - Contact Jess Harrison on 67211241

27/9/05 - Dung Beetle Monitoring Field Day - Manilla - Contact Brenda Shepherd 67850091 for details.



A HEALTHY CHOICE MEANS eating more insects

As the summer months approach we tend to shed a few layers of clothing and are often amazed at the human body's propensity to store nutrients. Oh, alright - fat.

As a service to readers and a follow up to the popular series on the Plague Locust Diet we offer the following information on an economical way to fly, crawl or hop into summer.

Insects for a protein diet include termites (36%), beetle larvae (23.1%), beetles (13.4%) and water bugs (38.1%). Those looking for a low carb diet can also use the above insects as those high in protein tend to be low in fat and carbohydrates. For those who are avoiding "fad" diets but needing an extra snack between meals, larvae may be the answer as, although quite filling, larvae contain 60.7% water (on average) making them the perfect "between meals" treat.

Of course a balanced diet is always the best idea so why not try a combination? Mixed insects may be prepared in a number of interesting ways. They may be boiled in water to form a stock, simmered in soy sauce to create an asian style soup, dried and ground into a flour, sautéed in butter and garlic (yummy), broiled in a mixture of preferred vegetables and insect stock to form a nutritious stew or chopped finely, mixed with egg, flour, onion and seasoning to form patties which may be grilled or fried.

Of course this diet has additional benefits as does the Plague Locust Diet - it includes a compulsory fitness component which we like to call "the snatch and catch" movement - great for trimming the tummy and toning hips and thighs.

Just a cautionary note - it is wise not to eat insects which sting or have an unpleasant odour as these characteristics can persist even after careful preparation. These are best left to the experts.