Northern Tablelands Dung Beetle Express

NEWSLETTER SUMMER 2003

THERE WAS AN OLD LADY WHO SWALLOWED A FLY ....

And she isn't the only one! The bush flies are fairly buzzing about at the moment and the bad news is that they aren't likely to decline unless several other factors come into play.

Firstly, lets look at how bush flies breed. The female bush fly must have a protein source in order to become fertile. Humans are a great source of protein - in the form of tears, saliva, mucus and sometimes blood. So the majority of flies which annoy humans are female with the males just hanging around waiting for the women to stop feeding long enough to mate with them. (Sound familiar?) The average ratio is usually around 3 females to every male. Now fly sex is very interesting- well perhaps not very interesting but certainly a bit interesting. Fly sex lasts for about 1 hour and 20 minutes ! (no comment)! Anyway this marathon effort results in the female producing two hatches of eggs.

The female selects a nice fresh dung pad, feeds again, then deposits between 5 and 50 eggs into a suitable crevice.

Given an optimum temperature of 21 degrees hatching occurs incredibly quickly - in as little as 5 hours. The maggots then begin to feed on the dung pad. They need to stay moist but also need access to air so as the pad dries out and air pockets form between the crust and the moist inner part the maggots move deeper into the pad.

After a few nights the maggots leave the pad (between midnight and dawn - what a lovely thought, like coral spawning perhaps?), they then bury into the soil and between 3 to 18 days later emerge as adult flies.

Interestingly, a low soil moisture content favours pupal development. In one experiment no flies hatched when soil moisture content was 25% with the best survival rates occurring when the soil moisture content was between 8 and 14%.

Conversely dung beetles require rainfall and warm conditions to trigger larval development and emergence. The bottom line is that not only do drought conditions hinder dung beetle emergence thus allowing fly numbers to increase rapidly, drought also delivers soil conditions which assist fly pupa to develop.

The fascinating "fly facts" contained in this article were sourced from The Fly in Your Eye" by Jim Heath. For further creepy crawly books see www.viacorp.com/jim.html.

Inside this issue:

Tips for maintaining Dung Beetle Populations:

- **Eliminate Predators (Foxes, Feral Pigs, Cane Toads)**
- **Strategic use of parasiticides**
- **Improve pasture health - better quality dung = higher dung beetle fertility rates**

AND ON TO OTHER PESTS

Buffalo fly season is also complicating life for many graziers at the moment. Buffalo fly feed on cattle and buffalo blood and as they feed between 10 and 40 times per day the irritation they cause can lead to weight loss and hide damage. So the only thing to do is reach for the chemicals right? Actually, there are other solutions and there are good reasons to consider alternative control methods.

Parasiticide use can result in considerably long withholding periods, chemical resistance and often has a negative impact on beneficial dung fauna such as dung beetles.

Dung beetles can be a very effective in controlling buffalo fly numbers. The eggs, larvae and pupa of the buffalo fly all depend on dung for survival. The optimum conditions required for successful hatching from egg to adult are a temperature of 25 degrees and 75-85% dung moisture content.

By tunneling through the dung pad, removing pieces of it for food/brood balls and generally causing disruption dung beetles can reduce buffalo fly population considerably. Unfortunately, an abundant dung beetle population is required for them to have significant impact on overall buffalo fly numbers.

The problem with many chemical options available are that they are toxic to dung beetles with effects ranging from reduced fertility to direct mortality. This results in reduced survival rates and, subsequently, populations. So graziers are faced with a catch 22 situation.

Some alternatives have been suggested in an Agnote by Sally Spence and by pamphlets produced by Agforce. A buffalo fly trap originally developed by CSIRO and marketed by Range Motor Trimming (07 54999066) consists of a clear plastic tent which the cattle walk through. Flies are brushed off and die of desiccation. The trap removes 80% of flies each time cattle pass through it so even if they only enter the trap every two days good fly control can be obtained.

It is thought that a small number of cattle are "allergic" to buffalo fly and thus display a high level of fly worry. Culling of these cattle allows treatment to be delayed until a more representative proportion of the herd is being affected.

Typically, dark coated animals and bulls are the first to be targeted by buffalo fly. It might be viable to restrict treatment to these animals in the first instance. It is also advised that graziers decide on an "acceptable" level of buffalo fly activity before implementing chemical treatment. Research suggests that infestations generally need to be greater than 200 flies per animal to cause a significant reduction in milk production and weight gains.

The delivery method of the chosen parasiticide can also play an important role in reducing the amount of chemical contamination in the dung. Generally oversprays, backrubbers, dust bags and ear tags result in less chemical residue in the dung.

Some products have been shown to have little or no impact on dung fauna - obviously this factor should be a consideration when choosing the best method of buffalo fly control.

Further information can be found in the Agforce Pamphlet "Consider your Dung Beetles when using parasiticides" and Agnote DAI/140 (2000) "Buffalo Flies and their control" by Sally Spence.

And now the carnival is over .....

And while it's been fun the aims of the original Dung Beetle Project have been achieved and it is time to move on to the next stage. The focus for the project over the coming months will be to monitor the releases made over the 2002/2003 period to see if all the extra effort was worthwhile. This may be difficult to quantify as prolonged drought conditions are expected to have had a detrimental effect on adults in diapause and the eggs and larvae waiting for rain and warm temperatures to trigger development and emergence.

The project also plans to make several harvests and to undertake more re-distributions. Several sites have been identified as having populations which are abundant and, therefore, harvestable.

There are still a number of beetle species we haven't been able to locate. If any of you notice an interesting (or unusual) beetle species please contact the Project Officer as it may be that you have just the thing we're looking for.

HI HONEY, I'M HOME!

While we are aware that this offering from "Insanity Streak" (Sunday, 23/11/03) is not about dung beetles it was too funny to resist! Puts a real twist on the definition of a "love bite" in the mantis world doesn't it?

Will I, won't I, should I join the dance? (apologies to Lewis Carroll and the Lobster Quadrille)

And do I have a choice? If you're the introduced ball roller, *Sisyphus spinipes*, you probably don't. This species is commonly found in large numbers in single dung pads (a recent trapping recording over 2,700), however an adjacent pad may have no rollers at all. This strange phenomenon is likely the result of another P word. The word is Pheromone and refers to chemical emissions which influence the behaviour of others. Pheromones are a useful communication tool, particularly in the insect world, and can be used to repel or attract others of the same species or completely different species. In this case the pheromone probably signals availability of a food source or potential partners. So the colonised pad has the same attraction as the local fine restaurant or singles bar - everyone else is there so it must be good, musn't it? As ball rollers remove the dung from the pad the pressure to avoid competition is not as intense as it can be for tunneling species who remain in, or dependent on, the pad for longer periods.

This species can remove an entire pad in a few hours. A pair working together remove nearly 400 balls. The balls are rolled to a safer area (away from stock movement) and are often found attached to fence posts etc. They may be found up to 30 meters from the original pad. The dung ball weighs almost 30 times more than the beetle giving a weight ratio similar to a human rolling a Holden car over and over.

Thanks to Dr. Penny Edward and Dr. Angus Macqueen whose interesting field discussion yielded the "pheromone connection" and to John Feehan (Soilcam) for the interesting facts pertaining to the ball rolling effort.

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Field Days

Just a reminder to get in early if your group or organisation is planning on holding a dung beetle field day. While some that were planned for late spring were postponed due to lack of rain, other days have been tentatively arranged.

The majority of these will be held in January/ February 2004. Please contact the Project Officer for details.

BEN LOMOND - Proposed date 6/1/04 - Please contact the Project Officer or Sarah Harding (Ben Lomond Landcare Group - 67332065) for further information

www.dungbeetles.com.au

DO WHAT YOU "DOO DOO" WELL - But don't send it to me!

In all seriousness, as much as I truly enjoy getting little parcels of beetles (and related products) in the post, there are exceptions. In the interest of continued cordial relations between myself, other staff and beetle enthusiasts I thought I'd clarify a few points of etiquette which, while not mentioned by Emily Post, certainly should be.

Firstly, all beetles sent in the post must be dead! Live beetles dig out of their containers and cause distress to postal workers and other users of Australia Post. Dead beetles should not be put in plastic containers, they sweat, decay and quite frankly - they stink ! This leads to dodgy identifications to say the least.

Please label all dung beetle related postings clearly. Other staff can be a bit squidgy if they open a parcel containing dead beetles, fox scats, Ibis gizzards etc. (Actually NOT posting the Ibis gizzards would be appreciated).

Another small gesture that would be appreciated is if you could make a note (a LARGE note) on the container if the beetles you found were not in cattle dung. I have no objection to handling dead beetles which were discovered in the dung of herbivores (ie horses, sheep, goats etc) but I like forewarning if the specimens in question were found in carnivore or omnivore dung (dog, human etc.). This distinction has little (no) scientific merit but allows me to decide not to handle the beetles ungloved. I realise this is slightly discriminatory but, hey, we professional "dung handlers" need to maintain some standards.

Having said all that please continue to send in your thrilling finds - they are often very interesting and with a little practice I'm sure the rules of etiquette for "Dung Beetle Related Stuff" will come quite naturally.

Cheers,

Pam