

Caring For Dung Beetles

by Sharon Roberts

The Lucyvale farming community's National Landcare Program grant to establish new species of dung beetles in the isolated valley in Victoria involved education of property owners on caring for the beetles. This was undertaken prior to releasing new colonies, and included information about the effect of drenching chemicals on the lifecycle of the dung beetle.

LIFE CYCLE

Dung beetles mature quickly. There are differences in maturity time between species, but generally, the first week after hatching they are babies, the second week, they are teenagers and the third week they are breeding adults. Like the young of all living creatures, they are most susceptible to toxic chemicals (including drenches) when in their juvenile stages.

CHEMICALS

Not all drench chemicals have been tested for their effect on dung beetles. The CSIRO commissioned a report that tested the effects on four species of beetles; *Onthophagus gazella*, *O. taurus*, *Euoniticellus intermedius* and *E. fulvus*. Drugs in three chemical families were tested; Anthelmintics, Ectocides and Endectocides.

The Anthelmintics; Albendazole, Fenbendazole, Levamisole, Mebendazole, Morantel and Oxfendazole, had no known effect on any stage of dung beetle development.



The Ectocides (synthetic Pyrethroids), Cypermethrin and Deltamethrin affected all stages of development.

The Endectocides (Macrocytic Lactones), are divided into two groups. **Avermectins;** these are Abamectin, Doramectin, Iprinomectin and Ivermectin, which had no known effect on mature adults, but affected breeding females and increased the mortality rate amongst young adults, eggs and larvae. The second group, **Moxidectin** had no known effect on dung beetles, when used at the manufacturer's recommended rate for the treatment of cattle.

Reading the labels of drench chemicals and understanding how the active ingredients affect dung beetles is critical when establishing new colonies, and highly desirable for sustainable horse keeping. However, sometimes a particular parasite may need targeting with a drench that is not 'dung beetle friendly'. By understanding the beetle hatching and breeding cycle, and observing their behaviour, it is

possible to time drenching when it will be least damaging.

When dung beetles hatch, they crawl from their underground tunnels, fly to fresh manure piles (they prefer dung less than 48 hours old) and feed by sucking the juice. The dung often appears 'fluffed up' when they are in this juvenile stage. Depending on the species, maturity may only be a couple of weeks away, and is characterised by the beetles beginning to tunnel. Soil casts appear around the edges of the dung pile, and when flipped over, holes can be observed in the ground.

If you notice individual beetles hovering over a pile of manure, then flying off without landing, this doesn't mean the end of the breeding season, but quite the opposite. Just like any town on a Saturday night, these beetles are 'cruisin'. They are the 'guys' checking out the 'dung cafe' to see if there's an available female munching there. If not, they cruise on to the next one.

Avermectins exert their most harmful effects in manure for two to three weeks after drenching. Therefore, drenching as late as possible into the adult stage of beetle development, when the majority of egg-laying is completed may be the least damaging option.

Establishing and caring for dung beetles is the first step to reaping the benefits these beetles offer. 🌱

Safety Warning

As more people from non-traditional farming backgrounds move onto a few acres, the potential for accidents increases, particularly in regards to the use of machinery. Horse property owners, regardless of the acreage size, can always benefit from having their own tractor, but many are unaware that tractors are still the main cause of death on farms across Australia.

One aspect of tractors that can be extremely dangerous are the PTO (Power Take-Off) shafts. These are the drive shafts at the back of the tractor, which operates the connected machinery such as ploughs, scarifiers and slashers. Many accidents have been attributed to unshielded PTO's over the years.

John Deere, the tractor company, pioneered the development of shielding Power Take-Off (PTO) drivelines back in 1938. Since then, in the interest of safety, patents for PowerGard™ shields and hinged master shields were freely given by John Deere to help prevent accidents and injury, regardless of what model or make of machinery was used.

In 1940 John Deere began installing power take-off shields on tractors and made available retrofit programs for tractors produced after 1932.

SAFETY

When working around the PTO, it pays to keep the following precautions in mind:

Keep the tractor master-shield in place at all times, and do not use the shield as a step.

Stop the engine and make sure the PTO driveline is stopped before making adjustments, connections, or cleaning PTO driven equipment.

Entanglement in rotating driveline can cause serious injury or death. Keep PTO shield and driveline shields in place at all times. Make sure rotating shields turn freely. If they don't, immediately replace them with new ones.

Keep away from PTO and rotating shafts while in operation.

Tie long hair back and wear close fitting clothing. Avoid shirts and



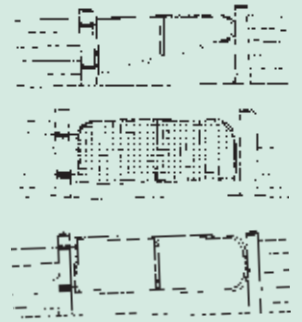
Users should exercise extreme caution when operating tractors with a PTO shaft.

pants with draw strings or dangling 'bits'.

Young children are especially vulnerable because they tend to play in work areas, around equipment and animals. Keep them safe by warning them of potential danger and keeping them in mind as you work on the property.

A free copy of the John Deere Safety Collection CD-ROM, is available by emailing info@deere.com or contacting free call 1800 800 981. 🌱

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