

Getting dung beetles to work for you

Dung beetles were introduced to Australia by Dr George Bornemissza of the CSIRO to bury dung dropped by introduced herbivores and they have done a remarkable job. But according to dung beetle expert John Feehan OAM, livestock managers could be making much better use of dung beetles than most are at present by introducing more species to their grazing systems. By **Jill Griffiths**



John Feehan has been working on dung beetles for more than 50 years and is passionate about ensuring farmers make the best use of them. Photo: Jill Griffiths.



Active dung beetles can completely bury dung beneath the soil surface, making nutrients more available to plants. Photo courtesy John Feehan

AT A GLANCE

- ▶ Native Australian species of dung beetle are not adapted to the dung of introduced herbivores such as sheep and cattle
- ▶ It is possible to have dung beetles working for 9-10 months of the year in most agricultural areas of Australia
- ▶ In the process of burying dung, dung beetles help incorporate nutrients into the soil and control parasitic worms

Feehan explained that from 1969 until the mid-1990s, the CSIRO dung beetle program released 53 introduced dung beetle species in Australia.

“In most areas of Australia, it is possible to have dung beetles actively working for up to 10 months of the year,” Feehan said. “At the present time, the two species that will be active in the two month gap are not yet established. But you need different species to work at different times as each species works for three or four months and then goes into hibernation.”

Feehan spent 31 years working at CSIRO on the dung beetle program and since leaving CSIRO has run a consultancy service which has supplied 5000 starter colonies of dung beetles and advising about their use in agriculture. He has, of his own admission, spent “52 years in the crap”.

Feehan speaks with contagious enthusiasm about the many benefits dung beetles bring to livestock, pasture and catchment management.

“Dung sitting on the surface of the soil is wasted,” he said. “When it rains, the nutrients run off into waterways and cause

nutrient enrichment problems and algal blooms, and rob the productive land of valuable nutrients. Not only that, but it gives bush flies and buffalo flies places to breed, and enables internal parasites to complete part of their life-cycle.

“When dung beetles are active, they process and bury the dung underground. The species that have been introduced to Australia, bury dung in the top 20-30cm of soil, which is where most plant roots grow.”

MULTIPLE BENEFITS

Dung beetles are attracted to dung and nothing else, so present no danger to crop or pasture plants; they will not switch over to feeding off plants if there is no dung available. They roll dung into balls in which the female beetle lays eggs and the larvae develop. In the process of forming the balls, the beetles kill any existing parasitic worms or larvae in the dung. The dung balls, which are actually brood balls for the dung beetle larvae, are placed in the tunnel system under dung. These tunnels aerate the soil, and provide easy routes for water and roots to penetrate the soil.

When very active, dung beetles will bury a cow pad is a matter of hours; at times of lower activity, it may take up to three days. Either way, burying the dung will break the breeding cycle of bush flies and buffalo flies, with consequent benefits to livestock.

“Buffalo fly can reduce weight gain in cattle by 30-40kg over a season. They are also known vectors of pink eye in sheep and cattle. Dung beetles can reduce the fly population by 99%,” Feehan said.

“When dung sits on the surface, 80% of the nitrogen from it goes up into the atmosphere; when the dung is buried, that figure is reversed and 80% goes into the soil, and is made available to plants.

“You couldn’t manufacture a machine that was more efficient at burying dung.”

LONG TERM GAINS

Feehan’s only word of caution on dung beetles is that the results don’t happen overnight.

“I’ve had fellows buy dung beetles from me and they’ll release the colony into their paddock on a Saturday and by Sunday night they ring me up and say there’s still dung all over the paddock,” Feehan said.

“It doesn’t happen overnight. The beetles need time to breed up and get working. You could put beetles out this year and see nothing at all happening, but in three years’ time, you may be amazed. There’s no reason why a species you release onto your farm this year won’t still be working out in your paddocks when your grandkids take over your farm. They’re incredibly tough –

there is no need to change a single farming practice other than making sure you use a dung beetle-friendly drench. Dung beetles tend not to be attracted to dung when animals are fed grain due to fermentation in dung. Dung beetles have evolved with animals grazing on pasture grasses.”

The literature indicates that it is best to check active ingredients in drenches before using them, and also check dung beetle activity in the paddock.

Abermectin is the most damaging active ingredient for dung beetles, followed by doramectin, ivermectin and eprinomectin. Moxidectin is less toxic to dung beetles. Drenching when beetles are dormant will also help them survive.

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Dung beetle activity varies throughout the seasons, depending on which species are present in the area. Photo courtesy John Feehan.

IDENTIFYING YOUR DUNG BEETLES

John Feehan supplies a free service to farmers to identify introduced and native dung beetle species.

- To find out what species you have:
- Select dung pads which have a margin of fresh soil around them.
 - Approach the dung pads quietly so that the beetles do not crash dive down their tunnels.
 - Use a long-handled shovel to scoop up the dung and 2cm of soil underneath the dung pad.
 - Place soil, grass and dung into a bucket.
 - Fill the bucket with cold water and stir gently.
 - Collect beetles as they float to the surface.
 - Kill the beetles in hot water.
 - Dry beetles for two days on newspaper (out of direct sunlight).
 - Select approximately three beetles of each different species.
 - Place beetles into a match box without cotton wool and without sticky tape.

Send the sample, along with your name, postal address, phone number, and a map clearly showing your property location to:
SOILCAM – Free Identification Service
Mr John Feehan
3 Prell Place
HACKETT ACT 2602
Phone: 02 6248 0376

This is a free service but it is appreciated if you provide a stamped, self-addressed envelope. You will receive a list of:

- The identified CSIRO-introduced species present on your farm;
- A list of additional introduced dung beetle species suitable for your climate; and a list of those species which SOILCAM can supply and the approximate cost, which will depend on availability and ease of harvesting.
- A new species of dung beetle costs approximately as one single ton of phosphate fertiliser.