John Feehan's Dung Beetle Journey

John Feehan entomologist and renowned dung beetle expert has dedicated his life to increasing awareness to dung beetles. His objective is to have Australia fully stocked with beetles. John has 5 insects named after him, has an OAM for his service to the agricultural industry and in 2011 reached the final 14 in the highly prestigious Australian of the Year award.

John Feehan (pictured) affectionately known as the "farmers friend" is considered to be an icon of the Australian livestock industry.

From 1963 to 1991, John Feehan spent 28 years working on the CSIRO dung beetle program introducing dung beetles into Australia. After the program finished John set up SOILCAM Pty Ltd in 1993 to enable harvesting and redistribution of different dung beetle species according to their climatic and geographic limits in Australia, using CLIMEX, the climate matching program. Since that time SOILCAM Pty Ltd has relocated more than 5000 starter colonies (involving 19 different species) within Australia and has exported a number of species to five overseas countries. SOILCAM is now the largest distributor of dung beetles in the world.

In the past 25 years, John has travelled the continent attending farm field days, museums, land care events, water catchment conferences and schools promoting the environmental and soil fertility benefits dung beetles produce in Australia.

John has had articles accepted for publication by "Australian Geographic", "Outback Magazine", "Acres USA", the Sydney Morning Herald and more than 50 rural newspapers.

A regular interviewee in print, broadcast and electronic media, he has been invited to appear on rural programs such as ABC TV "Landline" twice. John has presented in New Zealand and was an invited speaker at the Natural History Museum in London and presented at 5 universities within the United States as well as the US Environmental Protection Agency in Washington DC and at the Veterinarians and Beef Producers Conference in Phoenix in 2004. He has also exported several CSIRO introduced species to the USA of which four have become well established. In addition one of these species is established in south east Canada.

John has lodged more than 1000 specimens of dung beetles in the Australian National Insect Collection (ANIC) at CSIRO for future reference.

John has been invited to speak to Members of Parliament about the benefits of dung beetles for beef producers in Australia on several occasions and is mentioned in Hansard records on 23 August 2011.

Recently John has been integral in persuading our federal government to import several more dung beetle species into Australia to add to the over 23 species we have now.

John Feehan has presented on dung beetles throughout the globe. Pictured here discussing beetles on a cattle station in the NT.

For more information on John Feehan and SOILCAM Pty Ltd including how he can assist you to establish dung beetles on your property go to dungbeetleexpert.com.au

Why do we need dung beetles?

Every day, the average cow produces 10 to 12 litres of dung per day. That means Australia's 27 million cattle produce over 270 million litres of dung each day. Left alone the dung can fowl waterways and dams leading to toxic algal blooms as well as creating rank pasture and fertile breeding sites for pests and parasites. Dung beetles in Australia either tunnel dung under the ground or roll it away in balls for burial into the ground. This activity has significant benefits for grazing systems.

Dung Beetle Benefits

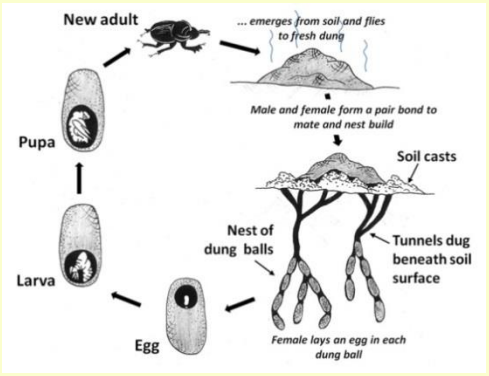
Carbon storage

- ✓ Taking organic material underground.
- ✓ Aeration of soil from the tunnelling system together with buried dung creates microbial activity which in turn stores massive amounts of carbon.
- ✓ Dung beetles are capable of tunnelling into compacted soils enabling plant root systems to penetrate more deeply locking up carbon.

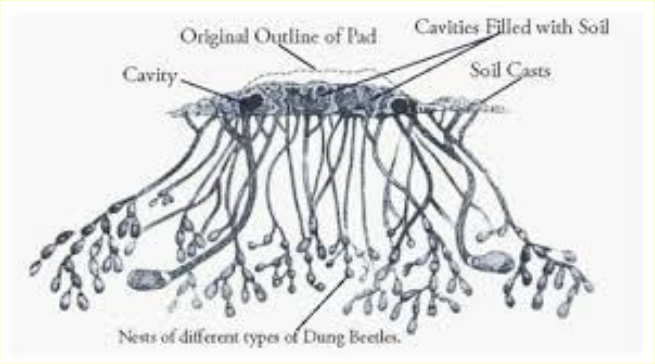
Dung removal resulting in both the soil cast (top) and where the surface has been cleared away by hand to expose the tunnels (below).

Overall benefits of dung beetle activity in grazing paddocks and catchment areas are as follows:

- ✓ *Aerates the soil*
- ✓ *Relocates nitrogen and phosphorous in the dung to the grass root zone*
- ✓ *Deepens top soil by slowly cultivating and turning it over to a depth of 300mm, encouraging microbial activity*
- ✓ *Provides habitat and food supply for earthworms*
- ✓ *Increases rain water penetration and improves ground water retention*
- ✓ *Allows more nutrients and chemicals from herbicides and pesticides to penetrate tunnels resulting in minimising unwanted run off*
- ✓ *Enables the locked up phosphate of many Australian soils to be made more available for plant utilisation via the tunnelling system*
- ✓ *USA research revealed 80% of the nitrogen in dung when left on the pastures is lost to the the atmosphere while dung that is well buried retains 80% of the nitrogen at the grass root zone.*
- ✓ *Reduces internal parasite and fly burdens by decimating their breeding sites through rapid dung burial*



Dung Beetle Life Cycle



Typical Dung Beetle tunnelling system

Did you know?

An MLA funded project demonstrated that a single species, Bubas bison, can improve pasture growth rates by up 30% with responses persistent for greater than 3 years.

Rapid removal of dung pads can reduce internal parasites 9 fold when an active healthy colony removes the dung within 48 hours.

Dung Beetles and Climatic Matching

While the introduction and dispersal of dung beetles into Australia over the past 50 years has greatly boosted dung burial our industry has a long way to go before rapid dung removal and burial can be considered widespread effective. John Feehan's aim is to have at least 10 species actively working on every farm in Australia by 2050. While there are some pockets where this has been achieved currently many regions of Australia have less than 3 to 4 species. Dung beetle species can require specific climates and temperatures. It is essential that the introduction of a new species to a new area needs to be "climatically matched". Individual dung beetle species maybe suited to a specific season such as spring, summer, autumn or winter. In turn beetles may be day or night flyers, even as activity specific as morning, midday or afternoon. Some beetles prefer wetter climates other drier.

Chemical effects on Dung Beetles

For thousands of years dung beetles have survived droughts, floods, fires and the presence of numerous predators. It is not uncommon in Australia to see foxes, birds, cane toads and others hovering over a dung pad feasting on dung beetles. While this may appear to have a significant impact upon beetle numbers in fact it is has a relatively minimal effect.

However the CSIRO have reported that some commonly used agricultural chemicals within animal husbandry particularly some drenches can have a devastating effect on beetle populations. While not all pour on and injectable drenches are dangerous to beetles it is wise to ensure the brand you are using has minimal or no effect on dung beetles.

Dung Beetle Stages	Eggs/ Larvae	Breeding Females	Young Adults	Mature Adults
Moxidectin	No Known Effect	No Known Effect	No Known Effect	No Known Effect
Doramectin	Increased Mortality	Reduced Breeding	Increased Mortality	No Known Effect
Ivermectin	Increased Mortality	Reduced Breeding	Increased Mortality	No Known Effect
Eprimectin	Increased Mortality	Reduced Breeding	Increased Mortality	No Known Effect
Abamectin	Increased Mortality	Reduced Breeding	Increased Mortality	No Known Effect

Above table adapted from information contained in CSIRO Contracted Report #56 by KG Wardhaugh (2000) and scientific papers or reports either mentioned therein or located independently.

Phosphorous a Declining Resource

Experts believe that global resources of high value phosphorous will be so depleted within the near future. Researchers in Australia, Europe and the US have given warning that the element so essential to



all living things, is at the heart of modern farming and has no synthetic alternative, is being mined, used and wasted as never before.

In 2008 Dana Cordell, a senior researcher at the University of Technology, Sydney said "Quite simply, without phosphorous we cannot produce food. At current rates, reserves will be depleted in the next 50 to 100 years".

It is known that phosphorous can be locked up in undisturbed soils never to be released until the work of a dung beetle intervenes who by tunnelling and aerating soils releases phosphorous allowing plant life to absorb the nutrient for growth.

Did you know a dung beetle can move 30 times its own body weight?

Identifying Dung Beetles

John supplies a free identification service to farmers to assist in identifying introduced and native dung beetle species found on your property.

To assist John in identifying the dung beetles please follow the steps below.

- ✓ 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
- ✓ Immerse beetles in hot water. This will euthanise them quickly.
- ✓ Dry beetles for two days on newspaper (out of sunlight)
- ✓ Select approximately 3 beetles of each different species
- ✓ Place beetles into a match box without cotton wool and without sticky tape

Please send sample to:
SOILCAM – Free Identification Service
Mr John Feehan
3 Prell Place HACKETT ACT 2602
Mobile: 0414 938 621

Please ensure your name, postal address and telephone number is attached with a road map clearly showing your location in regard to your nearest regional town.

To facilitate your free service it would be appreciated if you could send a self-addressed stamped envelope.

You will receive;

- The identified CSIRO introduced species present on your farm
- 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

If you would like to purchase dung beetles from SOILCAM or require further assistance contact John either by phone or go to his website.

SOILCAM can supply the following dung beetles:-

- Bubas bison
- Euoniticellus fulvus



- Euoniticellus africanus
- Euoniticellus intermedius
- Euoniticellus pallipes
- Geotrupes spiniger
- Liatongus militaris
- Onitis alexis
- Onitis aygulus
- Onitis caffer
- Onitis pecuarius
- Onitis viridulus
- Onthophagus binodis
- Onthophagus gazelle
- Onthophagus nigriventris
- Onthophagus sagittarius
- Onthophagus Taurus
- Sisyphus rubus
- Sisyphus spinipes
- Hister nomas (a predatory species)