

Waste management specialists finally arrive

New Zealand's early pioneers were remiss in not bringing 'waste management specialists' with them when they introduced farm animals to this country.

"Sheep and cattle have been brought to New Zealand without the associated beetles which evolved to process their dung," says Dr Shaun Forgie, director of Dung Beetle Innovations.

Early farmers brought worms to help improve soil fertility, but overlooked the vital role dung beetles play in pastoral systems, he says.

So now, more than 170 years since pastoral farming began in this country, dung beetles to process farm animal waste have finally arrived and Shaun says they have the potential to make a significant differ-

ence to the environment and farm systems. New Zealand does have native dung beetles which play a key role in decomposition in forests, but they are not able to utilise dung in open pasture.

11 species approved

Unlike the days of early colonisation, bringing new species to New Zealand is no longer easy. The first steps towards introducing dung beetles began in 2008 when the Dung Beetle Release Strategy Group was established by farmers and other interested parties with the objective of importing and releasing dung beetles to assist with the removal of pastoral dung of agricultural livestock.

The group's application to release 11 species of dung beetles in New Zealand was approved by the Environmental Risk Management Authority in February 2011, and a project to import and breed these beneficial insects was funded through the Ministry for Primary Industries' Sustainable Farming Fund and industry partners. Landcare Research provided the science and technical support to the programme.

Increased pasture

Now farmers are able to buy dung beetles from Dung Beetle Innovations, which breed them in a special facility in Northland for release on farms.

Shaun says research trials have shown that dung burial by the beetles increases pasture growth by up to 30 per cent and responses continue for more than two years after burial.

"At any one time in New Zealand, five per cent of all grazing farmland is covered in dung. Roughly 600,000ha is wasted due to cattle dung." Livestock avoid foraging around the dung in

an area about five times the size of the dung pat because it is repugnant to them. However, if dung beetles are present, they will fly to fresh dung, where males and females mate and build nests of dung balls in tunnels they form beneath the soil. The female lays eggs in each dung ball and between six weeks and six month later (depending on the insect species), a new adult dung beetle will emerge from the dung ball to begin the cycle all over again. The actions of dung beetles in burying dung increases soil nutrients such as nitrogen and phosphorus and may reduce leaching and volatilisation of

nitrogen from animal manure. Infection of livestock by parasitic nematodes has also been shown to reduce by 70 per cent as beetles aerate the dung which desiccates nematode eggs. Eggs and larvae are also damaged or destroyed by physical abrasion during dung manipulation and consumption by beetles. Shaun says the introduction of dung beetles is based on sound ecological science and controlled by stringent regulations, so they are unlikely to become pests. To find out more visit www.dungbeetleinnovatiob.com

Elaine Fisher



Dr Shaun Forgie, director of Dung Beetle Innovations, with beetles and their rather large dung balls at Fieldays 2017.