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The \$40 million solution is right under our feet

Te Awamutu Courier

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One dung beetle can bury 250 times its own weight in one night. Photo / Supplied

An estimated 100 million tonnes of cow and sheep manure are deposited on New Zealand pastures each year. Most sit for months on the surface as forage foul, lowering productivity owing to its repugnance and avoidance by grazing livestock. Imagine, then, that it is a sustainable goldmine of fertiliser and carbon if buried rapidly.

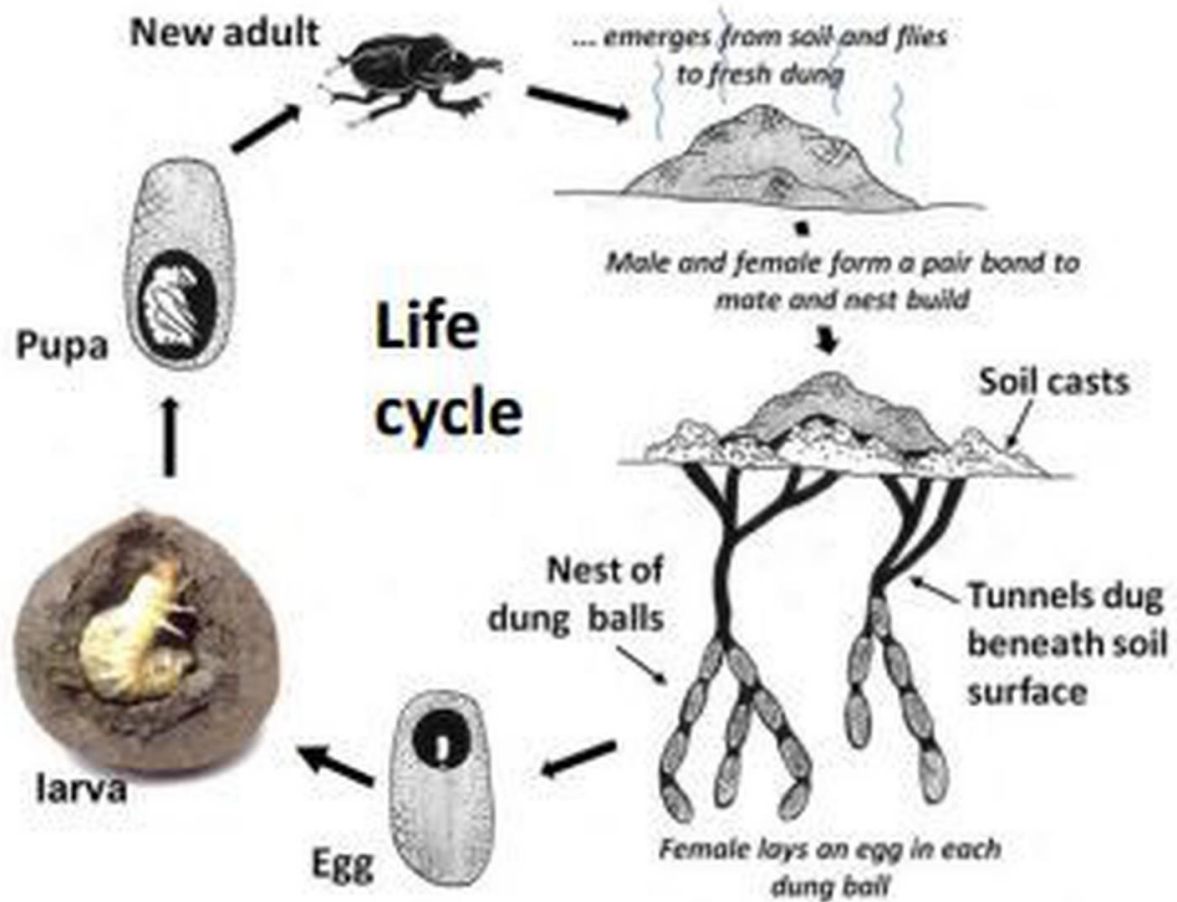
Dung Beetle Innovations (DBI) was launched in 2016, by the efforts of co-founders Dr Shaun Forgie and Andrew Barber. They are dedicated to rebalancing New Zealand's pastoral farming systems, and improving water quality and soil health — through leadership, education and the establishment of dung beetles as a sustainable farm management practice.

Dung beetles are suitable for all livestock farm types, from beef, dairy, sheep and deer, to alpaca, goat and horse, and all farming practices such as conventional farms that use drenches, organic farms, and biodynamic farms.

“Most of the varieties of dung beetle we mass rear in our facilities, located in Auckland, are suitable for the Waikato and King Country. A couple of species are suited for low-rainfall pastoral locations in New Zealand that rely on irrigators,” says Dr Shaun Dougie, one of the co-founders of DBI.

These critters are fast workers — scientists have observed about 4000 dung beetles converge on a fresh pile of elephant scat within 15 minutes. They work hard too; one dung beetle can bury 250 times its own weight in one night.

Research conducted abroad and locally proves that introducing dung beetles is a practical, sustainable and cost-effective way to alleviate many of the waste problems faced in farming.



Life cycle of a dung beetle. Photo / Supplied.

Dung beetles offer a remarkable natural solution to revitalise our pastures and can help to rehabilitate our waterways. The nicknamed “Underground Army” is so effective because their tunnelling reduces soil compaction and increases aeration.

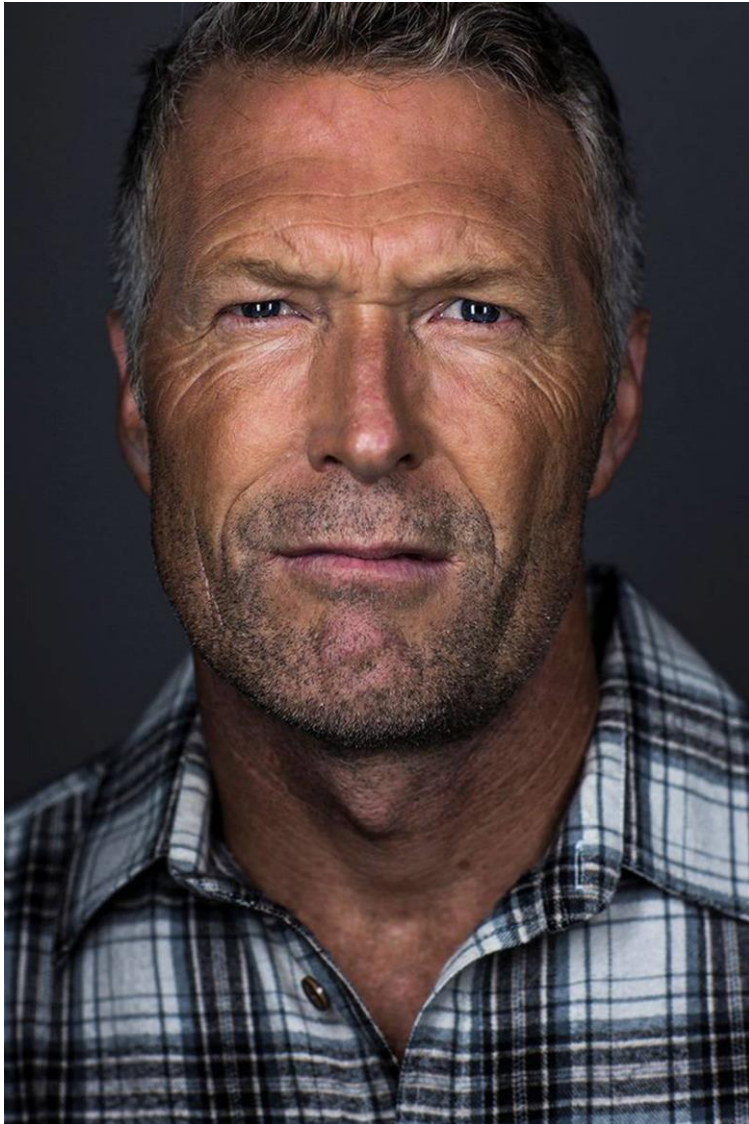
Dung burial leads to increased grass root growth, and then to better retention of dung and urine in the soil. This “virtuous cycle” reduces sediment and microbial contamination in run-off, reduces leachate pollution, improves pastoral production, and ultimately protects the quality of our waterways.

“There are huge economic benefits to the farmer and to the country. The farmer gets at least a 30 per cent increase in above-ground biomass, and nutrient content, reduced forage fouling, less-costly pasture management, and higher productivity. And using all that sustainable manure supply is a nutrient gold mine for free if it is buried. This will cut the farmer’s costs on expensive, unsustainable solid fertiliser inputs,” says Shaun.

This can also lead towards reduced disease transmission. Dung on the surface has been identified as a risk, due to the ability of organisms to survive in the dung. Dung beetles can minimise the possibility of spreading disease by rapidly burying fresh dung.

“We recently published studies in an international peer-reviewed journal showing that dung beetle activity on several soils in New Zealand on 11-degree slopes can reduce the surface flow of suspended contaminants by 80 per cent following severe rainfall events,

“That’s a significant improvement in water quality with 80 per cent fewer contaminants entering the waterways from livestock farms. We can now actually stop lying when we promote NZ as 100% Pure when 90 per cent of its fresh waterways are contaminated with E.coli as an indicator. Dung beetles are the missing silver bullet on our farmlands,” says Shaun.



Dr Shaun Forgie, co-founder of Dung Beetle Innovations. Photo / Supplied.

Shaun adds that he is a “dung beetle aficionado” who got involved with dung beetles back in 1991 when he was a technician working for Dr Jenny Dymock back in the Department of Scientific and Industrial Research days.

“I ended up completing an MSC Hons on dung beetles here in NZ. I could see then this country needed more-efficient pastoral varieties like every other agricultural country. NZ is the last to get on with it. I set about improving my qualifications gaining a PhD in dung beetle research in South Africa.

“Through the support of Manaaki Whenua Landcare Research where I was employed as a scientist, and an end-user group called the Dung Beetle Release Strategy Group, we applied to the government (Environmental Protection Authority formerly ERMA) for the importation and full release of 11 kinds of dung beetles suitable for NZ,” says Shaun.

Through the Environmental Protection Authority’s support, DBI gained permission to import the 11 varieties of dung beetles to NZ. Each one was imported directly to a PC2 containment

facility for disease testing. Once cleared and approved to release from containment, they were transferred to a mass-rearing facility. This facility now has eight varieties it mass rears, and boasts the world's largest mass-rearing facility for insects.

The Ministry for Primary Industries has supported two Sustainable Farming Funds in the formative years of the application and early release process. Environmental Protection Authority has helped regional councils. Wanaaki Whenua Landcare Research, Pomu, Ngati Whatua Nga rima o Kaipara, Federated Farmers supported the application and subsequent releaser trials etc. An array of NGOs including Southern Pastures, Landcare Trust and many farmers out there understand the common sense in establishing dung beetles for long-term sustained benefits both economically and environmentally.

DBI is proud to share that after years of laying the foundations for better animal agriculture in New Zealand, it was 2017 finalist in the prestigious NZI Sustainable Business Awards in the Transforming Food category. In 2019, it made the finals in these awards for two categories: Restoring Nature and Partnering for Good.

Looking to its future goals, DBI is aiming to release dung beetles throughout the NZ pastoral landscape to improve water quality and sustainable farming with improved soil health and productivity.

It hopes the Government finally creates a national dung beetle release programme or makes money available specifically for releasing beetles. "It will only take \$33 million over 10 years. We suggest a strategic more economical approach to improving water quality. Seed beetles across the pastoral landscape at \$10-40/ha. These will take about 80 per cent pressure off the riparian plantings once self-sustainable populations are flourishing from 9-10 years post-release. This means buffer strips don't need to be 10-plus metres wide costing \$,500-4000+/ha including 8-wire fencing and excluding four years of ongoing weed management.

"Instead, they can be 2m wide costing less and not have to retire so much productive pasture. So dung beetles plus fencing plus planting is the only sustainable solution to improving water quality because fencing and planting aren't doing it alone," says Shaun.

To get started in establishing your own beetle colony, head over to <https://dungbeetles.co.nz/get-started/#orde-form>