

Nature's Free Labourers

The dung beetle and the earth worm.

by Sharon Roberts

Earthworms are well known for converting vegie scraps, green waste and animal manure into fertilizer in the form of nutritious worm castings. So, with their appetite for horse manure well documented in the vegie garden or worm farm, why do we still have those fossilised piles of horse dung in the paddocks and yards, that are sometimes evident even twelve months after being deposited?

It's tough, being an earthworm. Ever tried digging a hole through compacted earth in the middle of summer? Earthworms don't carry jackhammers, nor can they work and breathe in an airless soil, and, if the soil is puggy and waterlogged, they drown. A well structured, aerobic, healthy soil contains lots of tiny air pockets and attracts earthworms like a magnet.

Commercial farmers use a combination of rotational grazing/cropping, machinery, soil testing and fertilizer/soil additives to build and maintain a healthy soil. However, running a couple of horses on a few acres doesn't give you the luxury of economy of scale available to large landholders. Grazing pressure and soil testing are the priorities to begin with, then if your

soil structure is still like concrete, the earthworms need a helping hand.

The earthworm's friend is feared by airport managers the world over for their ability to tunnel through the hardest, most compacted soil. The enemy of airstrips ... the dung beetle!

Australia has 250 native species of dung beetle. Most of these evolved to break down pelletised dung such as kangaroo. When the First Fleet landed on our shores with cattle, sheep and horses, it was another 170 years before somebody realised they forgot to import the dung beetles capable of breaking down the manure from these animals.

The CSIRO introduced over 40 varieties of beetle from Africa and Europe, and of these, thirty became established. Only one species, however, has reached its climatic limits as government funding ran out before the project was completed. It is now up to landholders and environmental groups to continue this work.

There are two types of dung beetle. The dung roller, like the Egyptian scarab, who roll their ball of dung away to hide or bury; and the tunneler, the most beneficial for our environment. Unlike the cane toad and other imported ecological



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disasters, dung beetles have no chomping mouth parts, so they can't eat any of our lovely little native critters and plants. All they can do is suck the juice from dung.

Their life cycle starts with finding a mate. The female excavates a tunnel under a nice fresh manure pile - these guys they don't bother with the fossilised specimens. The male passes the dung down to her and she lines the tunnel, places a dung ball at the end and lays her eggs in it. One and a half litres of soil are brought to the surface for every litre of dung buried.

When the eggs hatch, the larvae feed on the stored dung. They can hibernate underground in either the

larval or young adult stage until seasonal conditions are right for them to take flight. Beetles can smell fresh manure 500 metres away and fly upwind to reach the pat so they can have a feed, find a mate and begin the cycle again. The smaller species of beetles breed several generations each season, whilst the larger beetles breed less often.

Once dung beetles have been active in a pasture, they open the gate for earthworms and a host of beneficial micro-organisms, who can now penetrate much deeper into the soil. Manure is more readily broken down and recycled, plants grow deeper root systems and become healthier as do our equine companions who graze this improved pasture. 🌱