

From Grass to Cow Pies to Grass

When checking cattle on pasture you need two sets of eyes.

One set watching the cattle and the other set watching where you step.

Wherever cattle graze they leave dung patties and depending on the health of your pasture these patties can stick around for a long time (poor health) or a relatively short period (healthy).



When cattle excrete dung onto the soil surface, the failure of the pats to break down can challenge the productivity of the pasture.

Cattle consume forage, any nutrients not digested are returned to the system in the form of dung and urine. The undigested plant material that comprises dung is deposited on the soil surface, smothering plant growth in that area. Pasture fouling through continuous dung deposition that fails to degrade quickly can represent a substantial problem to producers if left unmanaged.

When a dung pat is deposited on a pasture, all of the available forage underneath and approximately 3 square feet around the pat is unused by grazing cattle until the pat is incorporated into the soil.

Dung degradation rates can vary from 50–100 day depending on weather and the season (spring vs. late summer), and up to 3 y in cattle grazing systems with high insecticide use.

It takes an army of organisms feeding on those dung pats and urine spots to consume and mineralize them so they can be utilized by plants.

Without active dung insects the nutrients from the patty will leach out into the surrounding soil, over-fertilizing nearby vegetation and leaving a “green halo” effect. The forage may look green and lush, but it is not very palatable to livestock initially, which can further remove additional grazing surface area. If you take (dung) insects out of the equation, that pie could be there for years,

Initially organisms like dung beetles, flies, earthworms, and nematodes will feed on the raw feces to feed their broods in and under the pasture platters. Ultimately, though, it will be the vast array of soil bacteria, fungi, and actinomycetes consuming these organic resources that are necessary to keep a pasture healthy.

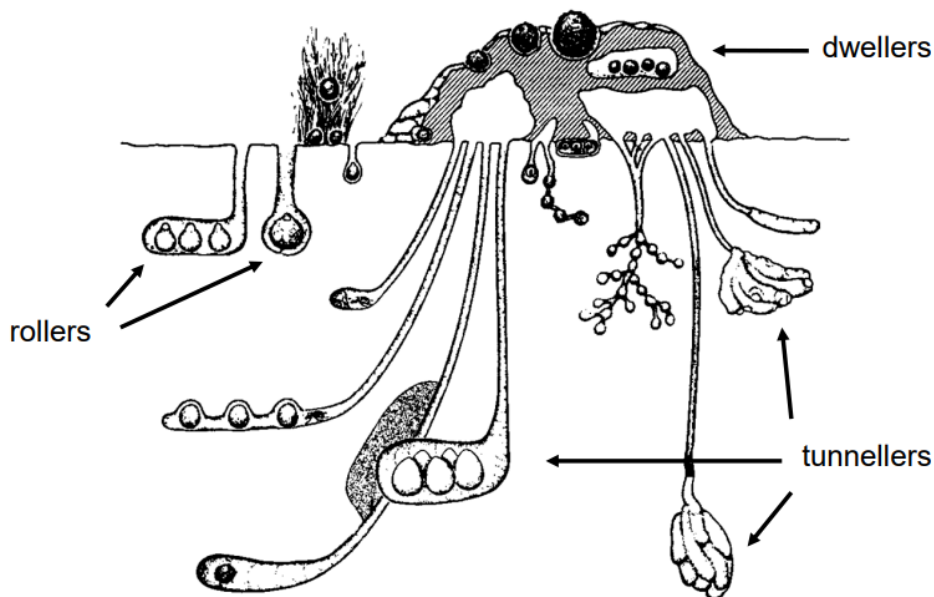


Figure 3. Dung beetles can be grouped into categories of ‘dwellers’, ‘tunnellers’ and ‘rollers’ based on their nesting behaviour. Within each category, different species of beetles may form different types of burrows. Image modified from Doube (1990) and reprinted from Floate (2011).

When insects are present, they dig holes, form tunnels. They physically remove chunks of the dung pat to accelerate the process of dung degradation. These tunnels improve the porosity for water infiltration and aeration. Plant roots can also enter these tunnels and use them as channels.

The presence of dung beetles, which eat and carve out caverns through the drying dung, means that the dung is being processed. Through their tunneling and bioturbation, they allow air to reach the center of the pat causing it to degrade faster (composting) by converting it into forms more accessible to plant roots and microbes

The tunnels also allow access to other insects that can't burrow to increase their effect on manure degradation or allow predatory beetles or spiders access while searching for prey such as pest maggots (face flies, horn flies and stable flies).

When manure has dung beetles active you start to see other creatures like maggots, earthworms and larvae in the patties. These dung insects not only help break down the manure so that the nutrients are available to bacteria, fungi and plants, they are an important source of food for small mammals and birds.

An ecosystem like this is a sign of a healthy soil.

For more on dung insects click on:

[Cow patty critters: An introduction to the ecology, biology and identification of insects in cattle dung on Canadian pastures](#)