

I am trying to calculate the volume of water inside my boots. It has been raining for the past several days, and the narrow path winding through the gorse and heather has transformed into a muddy river. Despite my best waterproofing efforts, I am completely saturated. Wearing a pair of fluorescent green rubber gloves and armed with a silicon spatula, teaspoon, butter knife, and a fish food container, I look more like an animated kitchen drawer than a scientist.

As an agricultural ecologist, I am interested in understanding how agricultural intensification impacts diversity of farmland invertebrates along with the services they provide. Today, I am collecting dung beetles for an experiment that will attempt to measure their sensitivity to soil cultivation. I scan my surroundings, scoping out my next target.

Suddenly I spot it. Just meters away, positioned innocuously within small patch of tightly grazed sward: the perfect cow pat. From where I stand, it looks to be about a week old. The structure of the dung is indicative of the diverse diet of the cattle grazing the rough commons. The land slopes gently to the south, and a portion of the dung is shaded by an overhanging branch. After poking through thousands of dung pats, one begins to get an eye for what makes an ideal habitat. To me, this pile of digested herbage looked like a dung beetle mecca.

Step 1: Have no shame

Gingerly stepping through the heath, I crouch down to get a closer look. Suddenly I slip and fall forward, just managing to catch myself with my forearm - my face is inches from the dung pat. I raise my head to see if anyone has witnessed this spectacle; a pony stares blankly back. Laughing quietly, I discard any shred of dignity I had remaining and roll onto my side, folding into the snug space between the dung pat and the spiny gorse.

Step 2: Make the most of your toolkit

I remove the butter knife from my pocket. Gingerly, I make a shallow cross-shaped incision along the top of the dung pat. Slipping the knife-edge under the crust, I peel back the first layer. Within this unlikely habitat is a diverse and active insect community. Dozens of water beetles quickly retreat into the dung in a brilliant wave of scuttling mahogany. I am not here for them today.

Observing the dung, I notice a small movement. A slow, clumsy twitch of a leg that can only mean one thing: a dung beetle. Using my teaspoon, I carefully remove the beetle from its home. I know this species to be *Aphodius ater* – a dwelling dung beetle measuring approximately 4-mm in length that is often found just below the dung crust. It's difficult to hold back a smile when looking at this beautiful little scarab. I place it in my container along with others collected earlier.

Step 3: Think like a dung beetle

I move deeper into the dung pat. Using my spatula, I sieve down through the layers soon finding an orange dung beetle recently revealed to be two cryptic species: *Aphodius pedellus/fimetarius*. Eventually, soil and yellowed vegetation begins to peek through the dung. A familiar bulbous black shape appears half buried within the soil and gently I pry it up: *Aphodius fossor*. This one is a female, but the male usually isn't very far. I use my spoon and carefully scrape below where I found the first. Three males appear... looks like trouble in paradise. I hold them in my hand, watching as they lumber along with a bodybuilder-like gait. Had I have not been as thorough, I would have missed these fellows.

Step 4: Be patient

The rain has subsided and the sun has appeared for the first time in several days. A faltering buzz answers the intermittent silence between the gentle 'chink' of stonechats conversing from the undergrowth. Suddenly something large whirs past my head and crashes into the dung pat,

capsized by a forceful landing. I am delighted to see that *Geotrupes stercorarius* has decided to pay a visit. Her underside gleams a mesmerising iridescent blue. Clubbed antennae waving, she rights herself and tunnels methodically into the dung. This species is scarce, and I won't find sufficient numbers for my experiments. Instead I watch in silent awe, imagining her excavating tunnels, burying dung deep within the soil.

I pause to shoo a yellow dung fly which has landed on my cheek – confirming my suspicion that despite torrential rain, I am in desperate need of a shower. Beetles in tow, I make my way back to the farmhouse. Pausing at the door, lost in thoughts of scarabs and experimental design - I pull off my boots and tip approximately 400-mL of water into the garden.