

## Getting started with dung beetle releases on your farm

There are some simple pre-requisites needed before you seed your farm with a starter colony of dung beetles. These are listed below and should be put into practice 24-48 hours prior to receiving dung beetles.

Please note dung beetles are for all livestock farms types (i.e., beef, dairy, sheep, deer, alpaca, goat, horse), and all farming practices (i.e., conventional farms that use drenches, organic farms, biodynamic farms).

Most information regarding dung beetles, what they do with the dung, their long term benefits and management are provided on the following website: <http://dungbeetle.org.nz/>

### *The aim is to maximise establishment success with the following:*

1. **Where to seed beetles on your farm (try to adhere to as many of the following as possible).**
  - a. **Sun.** Choose a sunny paddock. On hilly farms or farms with sloping paddocks, aim for a north facing slope that gets maximum sunshine.
  - b. **Shelter.** Not essential, but if possible choose a sheltered paddock which has natural contour shelter or shelter belt protecting the paddock or the part of the paddock, where the dung beetles will be seeded, from prevailing winds and bad weather. Beetles should be seeded on the leeward side of shelter.
  - c. **Ponding/surface flooding.** Avoid paddocks prone to ponding or surface flooding as this will inhibit or prevent dung beetle establishment and may adversely affect development of the eggs and grubs developing in dung balls buried beneath the ground by adult beetles.
  - d. **Central location.** Choose if possible the most central paddock on your farm to seed your dung beetles on. Alternatively choose one that is in the middle of your rotational grazing plan or located where the beetles can follow. Dung beetles detect the smell of fresh dung carried on wind currents and fly to the nearest fresh new dung supply.
  
2. **Making the chosen paddock a 'Dung Island'.**
  - a. **A dung island ensures there is ample fresh dung available in the paddock where dung beetles are seeded.** Do this by setting stock in the chosen paddock 24 hours prior to receiving dung beetles. Ideally, setting a few cows in the chosen paddock for a week or more would ensure a fresh supply of manure for the beetles as they settle down. In the event this isn't possible then choose a paddock that is within easy reach of nearby cattle. The aim is to prevent dispersal of the dung beetles, as dilution makes it harder for them to find one another and multiply. By keeping a good fresh supply of dung in the chosen paddock will mean dung beetles won't need to travel too far to seek out fresh dung and thereby disperse too soon
  - b. **Maintain the 'dung island' when the next generation of new adults emerge from the ground.** Mark on your calendar the day your beetles are seeded in your chosen paddock. Mark also the dung beetle species. Make sure there is fresh dung available with rotating stock or a small number of drench-free set-stock when the next generation of beetles are likely to emerge, or have cattle nearby so new beetles can locate the manure. Refer to the image below as a guide (time from egg to adult).
  - c. **Drenched stock should be kept in paddocks as far away as possible from the 'dung island' for at least a few weeks after drenching.** There are many active chemical ingredients in drenches that are passed in the dung shortly after its application to the livestock that are lethal to dung beetles (and earthworms and other dung feeders), see: <http://dungbeetle.org.nz/management-practices/>. There are a number of "dung beetle" friendly drenches available that can be used in conjunction with dung beetles. Alternatively there are a number of management practices that can be employed if drenching is continued in the presence of growing

populations of dung beetles (see link above). Studies have shown significant reductions (more than 70%) in gut nematode survival and reinfection of livestock in the presence of dung beetles. An integrated approach with dung friendly drenches and dung beetles will lead to better sustainable management of nematodes and nematode resistance.

### 3. Dung for seeding dung beetles

- a. **Use fresh dung that is no more than 24 hours old.**
- b. **Firm dung is better than sloppy or liquid dung.** Firm dung holds its shape and volume allowing for easier colonisation and formation of brood balls which the adult beetles make underground. Older dung has lost its chemical properties that attract dung beetles and has begun to degrade thus reducing its quality for feeding on by adult beetles and their developing young.
- c. **Avoid dung that has come from cattle that have been drenched within the last 6 weeks.**

### 4. How to seed dung beetles

Seed each manure pile by opening the manure with a trowel or spade and tip some beetles in, then cover over or close the opening you made with the manure. This will prevent their escape response. Beetles are especially active when it is hot in the middle of the day so watch they don't fly when you open the container lid and cover them over quickly once added to the pile! **For *G. spiniger* (paua beetle) add up to 10 beetles per manure pile. For *C. incertus* or *O. alexis* add 15-20 beetles per pile. For *O. binodis* and *O. taurus* add more than 20 per pile.** Seed manure piles in as close a proximity to one another as possible with all beetles of each species provided. You may choose to utilise different seeding paddocks for different dung beetle species if you are receiving multiple species. Just make sure all individuals of a species are located together. For example, don't put half of your *O. binodis* beetles in one location and the other half in a different location on the farm (see 2. Making the chosen paddock a dung island).

If you have any queries or need further elaboration on preparing your farm for releases please do not hesitate to contact: **Dr Shaun Forgie** 021 040 86 85; e-mail: [shaun@dungbeetleinnovations.com](mailto:shaun@dungbeetleinnovations.com), or visit the dung beetle website: <http://dungbeetle.org.nz/>.



#### *Onthophagus binodis*

- Size: < 12 mm
- Day active: spring – autumn
- generations per season: multiple
- Egg-adult: 6-8 weeks
- Burial depth: 15-30 cm
- Soil preference: all soils

#### *Onitis alexis alexis*

- Size: < 20 mm
- Dusk and dawn active: spring – autumn
- generations per season: 2+
- Egg-adult: 8-12 weeks
- Burial depth: 15-30 cm
- Soil preference: all soils

#### *Geotrupes spiniger*

- Size: < 25 mm
- Night active: Summer – winter
- generations per season: 1+
- Egg-adult: 4-6 months
- Burial depth: 20-40+cm
- Soil preference: all soils

#### *Copris incertus*

- Size: < 17 mm
- Night active: spring – autumn
- generations per season: 2+
- Egg-adult: 8-12 weeks
- Burial depth: 15-30 cm
- Soil preference: all soils

#### *Onthophagus taurus*

- Size: < 10mm
- Day active: spring – autumn
- generations per season: multiple
- Egg-adult: 6-8 weeks
- Burial depth: 10-20 cm
- Soil preference: all soils