

Dung Beetle Inquiry

The aim of introducing new species of Dung Beetles is to increase both soil production and water quality. As a class we have formed a social inquiry to ask students, teachers and the wider community what their views are on the introduction of the Dung Beetle into New Zealand and its effects on farming within the country. ①

The Dung Beetles that are being introduced are Tunnellers. Tunnellers are a type of dung beetle that disposes dung sitting on the surface into tunnels underneath. Creating tunnels for the dung to be pocketed in helps decompose it faster as it is more spread out and it also means that the nutrient rich dung is more available to the root systems of pasture. Creating tunnels in the soil also allows water easier access to root systems as well, allowing more water to the plants. ①

As a class we conducted various surveys in groups of 3-4. These surveys were sent out to people we thought would have a relevant opinion about the introduction of dung beetles into New Zealand. These groups included Teachers, students, parents and scientists.

As we can see above (**figure removed**), the question “Do you think NZ farms have too much effluent waste?” the number of people stating yes is 60%. This shows us that the majority of people think there does need to be changes on New Zealand farms to improve effluent waste. ③

Another point of interest comes from the question “Do you think bringing foreign organisms into New Zealand is a good idea?”. From the data collected, on average 66.7% of people think it is a good idea. This means that people do agree that if foreign organisms, such as the dung beetle. The main problem with introducing new species is if they carry diseases or if they interfere with the already stable ecosystems in place. Research conducted by Dung Beetle innovations states that there is no risk of human health or animal health connected with the introduction of dung beetles. ③

There was also support for the question “Do you think Dung Beetles will be good for our environment”. As the results state, 60.9% of people think they will be good for the environment.

Dung beetles being introduced could have both positive and negative effects on the environment. With dung beetles creating tunnels that allows water in that usually sits on top of the soil, runoff is reduced as a result. The nitrogen sitting on top of the soil is no longer carried into the rivers reducing nitrogen leaching. This ultimately increases the water quality of New Zealand rivers. ②

In the short term, introducing Dung beetles would obviously increase the number of dung beetles in the pasture, as a life cycle of the typical tunnelling dung beetle is 1-4 weeks. With the significant increase in dung beetles, dung building up on top of pasture would decrease as more and more dung beetles are available to decompose the dung. This results in a significant decrease in livestock parasites that hatch in dung. This is done when the dung beetles are rolling and burying dung beneath the surface, killing parasite eggs in the process. There would also see a decrease in flies such as the blowfly, stable biting fly and common house fly. The faster burying of dung helps achieve this in the same way as the parasite, by killing the eggs. However, if Dung beetles are introduced with diseases and bacteria that could affect the already stable ecosystem in New Zealand. If this was the case, it could affect not just livestock but also humans as well. ② ④

In the long term, the reduced nitrogen leaching into New Zealand streams would boost water quality. This would be an adequate step by the New Zealand Government to achieve their goal of making 90% of waterways in New Zealand swimmable by 2040. In the environments case, cleaner waterways would see an increase in native freshwater species such as the various species of Kokopu, whitebait, and Koaro, helping them become a more stable species. When dung is buried below the soil, it reduces the production of methane and nitrogen. This helps the environment by reducing greenhouse emissions from animal waste. ② ④

The application of tunnelling dung beetles will help increase soil productivity and water quality on the various farms around New Zealand. The tunnels that they provide help the root systems have easier access to water sitting on top of the soil. **Runoff is also reduced as a result of this, meaning that fertilizers applied to pasture will reach the roots rather than becoming runoff.** This is a positive because it will decrease the amount of nitrogen leaching off a farm, improving water quality.

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Rather than dung sitting on top of the pasture for days, it is stored in the tunnels beneath the surface speeding up decomposing time. **An average of 11% of pastures can be unusable due to it being covered by dung. The rich nutrients that dung can provide to soil and pasture is better used as it is beneath the soil, boosting pasture productivity.**

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In the short term, dung beetles being bought by farmers in New Zealand would increase the costs of production. **However, in the long term, dung beetles being rapid reproduces (approximately 1-4 weeks for a complete cycle) the pasture (depending on farm size) will be dung beetle rich. This will mean that most of the dung will be turned into tunnels. As a result, pasture will be more productive and grazing recovery time will decrease. Ultimately, more animals will be able to be farmed boosting profit and creating economic growth.**

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However, a long term negative impact of introducing new species of dung beetles into New Zealand is diseases and bacteria. **If the exotic dung beetles do end up having bacteria or diseases attached, they could have detrimental effects on the ecosystems already in place that have been here for hundreds of years. This could mean that farms may become completely unavailable for farming or other agriculture/horticulture businesses. The New Zealand economy being so reliable on the Agriculture and Horticulture businesses could experience catastrophic consequences.** The lack of supply would drive prices through the roof for the limited products that are available due to the high demand. Jobs would be lost and businesses may have to be shut down.

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So in conclusion, after researching through various reports and site, in my opinion I think bringing exotic tunnelling Dung Beetles into New Zealand is a good idea. **My main concern was if the introduction of Dung Beetles would cause negative environmental effect on the ecosystems here. However, the research conducted by Dan Tompkins reassured me that our quarantine systems are good enough to prevent this.**

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As Dung Beetles are claimed to increase water quality and pasture growth, I think it would be a good step towards increasing our economic growth within New Zealand. Water quality increasing also not only promote our clean green image but for the local population to have swimmable waterways by 2040 would be fantastic. Dung Beetles would not only add economic but also environmental value to New Zealand. It is these key ideas that have led me to believe it is a good idea to introduce exotic dung beetles into New Zealand.

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