



# Persatuan Pengguna Pulau Pinang Consumers Association of Penang

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**Letter to the Editor**

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## **Synthetic fertilisers are killing the microorganisms in the soil!**

Consumers Association of Penang (CAP) calls on farmers and consumers to avoid using synthetic fertilisers. It is because they can indeed have negative impacts on soil biodiversity, including the suppression of the activity of beneficial nitrogen-fixing bacteria, thereby negatively affecting the very crops people are trying to plant.

While synthetic fertilisers are able to enhance crop productivity in the short-term, their overuse and misuse can lead to long-term degradation of soil biodiversity and ecosystem health.

Synthetic fertilizers can alter the pH of the soil. Some fertilisers, especially those high in nitrogen, can make the soil more acidic over time. This change in pH can affect the microbial community in the soil, including nitrogen-fixing bacteria, which often prefer neutral to slightly acidic conditions.

Microorganisms are often misunderstood being the cause of diseases but on the contrary many of them are beneficial such as those thriving in the human gut and in the soil. Beneficial bacteria in the human gut, for example, helps in digestion and nutrient absorption, synthesis of certain vitamins, immune system regulation, protection against pathogens, and even metabolism and weight regulation.

In the case of soil, microorganisms comprising bacteria and fungi share a symbiotic relationship in enriching the soil. It is important to maintain the symbiotic relationship without resorting to synthetic fertilisers that destroys this delicate microorganism environment.

When plants have access to abundant nitrogen from synthetic sources, they may rely less on symbiotic relationships with nitrogen-fixing bacteria. As a result, the populations of nitrogen-fixing bacteria may decrease due to reduced demand from plants for their services.

Moreover, excessive use of synthetic fertilizers can lead to nutrient imbalances and toxicity in the soil, which can harm not only nitrogen-fixing bacteria but also other soil organisms. This toxicity can disrupt the delicate balance of soil microbial communities, leading to a decline in biodiversity.

Continuous reliance on synthetic fertilizers can create a dependency cycle where plants become less capable of utilizing naturally occurring nitrogen from the soil and increasingly reliant on external inputs. This can further suppress the activity of nitrogen-fixing bacteria and other beneficial soil microbes.

Synthetic fertilizers can also indirectly impact soil biodiversity by altering plant communities. Certain plant species that rely on nitrogen-fixing bacteria for nitrogen supply may decline in abundance, affecting the overall diversity of plant species in the ecosystem. This, in turn, can have cascading effects on other organisms that depend on these plants for food or habitat.

Overall, while synthetic fertilizers can enhance crop productivity in the short term, their overuse and misuse can lead to long-term degradation of soil biodiversity and ecosystem health. It is on this basis that CAP has been advocating over past decades for sustainable agricultural practices that incorporate organic amendments, crop rotation, and reduced fertilizer inputs which can help mitigate these negative effects and promote healthier soil ecosystems.

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