

Pellets which fertilise plants and repel pests

A Norwegian company along with researchers in Germany and Hungary have engineered a new type of pellet from cyanobacteria and fermentation residues from biogas facilities. They are a sustainable combined fertiliser and insect repellent which is suitable for organic farming, particularly brassicas. They are very good for the soil and cause no harm to bees and earthworms.

The demand for organic vegetables is continuing to grow. Many consumers are turning towards products which have not been treated with pesticides or chemicals. So the challenge for organic farmers is how to keep their plants safe from pests without chemical inputs. This challenge is far from simple, when cabbage root flies, for instance, lay their eggs in spring and autumn on freshly planted greens, an entire harvest can be lost.



In an EU funded project, scientists from the Fraunhofer Institute for Interfacial Engineering and Biotechnology (IGB) in Germany worked in collaboration with researchers from the University of West Hungary in Mosonmagyaróvár and on behalf of several organic agriculture associations. The results of their research were taken up by Norwegian company Bioskiva and developed into a product. Since the company also initiated the EU project they received patents in the EU in 2015.

New pellets as a solution

The product is a combined fertiliser and insect repellent which is suitable for organic farming.

"The pellets primarily consist of fermentation residues from biogas production, but they also contain 0.1 % cyanobacteria" says Dr Ulrike Schmid-Staiger, group manager at IGB.

When the pellets are placed around the vegetable plants, the soil flora degrade the cyanobacteria, which release a scent that repels cabbage root flies. The fermentation residues, which are rich in nutrients, also fertilise the plants.

Fermentation residues

The fermentation residues used are from organic farms. Liquid manure is decomposed into biogas, generating 300 litres of biogas per kilogram of organic dry mass in 2 weeks. Residues that cannot be further fermented are dried and used for the pellets.

Cyanobacteria

Cyanobacteria is a type of bacteria which is aquatic and photosynthetic. The research team used a flat-panel airlift reactor, originally developed for micro algae, to cultivate the cyanobacteria. They only used light, carbon dioxide and mineral nutrients to cultivate the bacteria. The researchers regulated the air

inflow to allow the mass to be thoroughly mixed without damaging the bacteria. They later used super-heated steam to dry the cyanobacteria, which was then mixed with the fermentation residues and pressed into pellets.

The pellets have been tested in open-field studies in Spain and Hungary. The researchers found that the cabbage root flies did not attack any of the growing cabbage or kohlrabi, and that the pellets had a significant fertilising effect.

The next phase

As the use of dead Cyanobacteria as a repellent to the cabbage root fly (*Delia Radicum*) is brand new approach, it has got to be approved by the European Commission. The company Bioskiva is now seeking partners to get this product out on the market

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