

# Biodegradable plastics pollute agricultural land too

Biodegradable agricultural plastics are not the solution for plastic pollution in agriculture, according to PhD research by Yueling Qi.

Qi has provided experimental evidence for the first time that both conventional and biodegradable farm plastics affect the physiological, chemical and biological processes in the soil.

Agricultural plastics are the main source of microplastics in farm soil. When the consequences of microplastics became clear, biodegradable agricultural plastics were developed to halt the accumulation of plastics in the soil. But to date it was not known what ecological effects the biodegradable plastics have on that soil.

Yueling Qi carried out lab tests and greenhouse experiments to measure the effects of these plastics on wheat plants and soil life.

## Microplastics

In a four-month-long experiment with pots, Qi used soil with 1 per cent microplastics, from either polyethylene or a biodegradable bioplastic consisting of Pullulan, PET and PBT. The trials showed that the presence of microplastics adversely affected

---

Biodegradable plastic had a bigger negative effect on growth than traditional plastic

---

the growth and development of the wheat plants. And biodegradable plastic had a bigger negative effect than traditional plastic.

In a following experiment, Qi discovered that the presence of plastic led to a big change in the bacterial community around the plant roots. The biodegradable plastics in particular had a large effect on the soil bacteria. The plastics also affected abiotic soil properties such as the acidity and the electrical conductivity, while the microplastics restricted the uptake and storage of water in the soil.

Lengthier experiments are needed to figure out the long-term effects of the plastics on soil life, says Qi. Her supervisor was Violette Geissen, professor holding a personal chair in Soil Degradation & Land Management. AS



Photo Shutterstock