

# Fields with wide range of crops 'don't need fertiliser'

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Farmers could stop using fertilisers and grow healthier produce from healthier soils if they mixed up their crops in a single field, according to leading ecologists.

Cows would also grow larger and their meat would be more nutritious if they grazed in pastures of more than 20 types of plant, rather than monocultures of grass.

"Diversity will replace fertiliser and diversify insecticide and fungicide and build soils much faster," Christine Jones, an Australian ecologist, predicted at the Groundswell soil conference in Hertfordshire.

British industrial farming relies on vast amounts of fertilisers, made of nitrogen and phosphorus, which are usually sprayed on pastures for grazing or arable fields of a single crop.

Dr Jones said that the chemicals inhibited natural interactions between plants and microscopic fungi in

the soil, which needed each other to thrive. Damaging the microbes was like "shooting the waitress" in a restaurant because plants could not then obtain the food they needed.

"We have created nitrogen deficiencies by using nitrogen fertilisers," she said. "I have never seen nitrogen-deficient plants anywhere but in a farmer's fields. I haven't seen them in a rainforest, I haven't seen them on the side of the road. I have only seen them in farmers' fields where they have been using nitrogen on the soils, which inhibits the capacity of nitrogen-fixing processes," she added.

Even though fertilisers could increase yields of crops in terms of weight, she said the plants were less nutritious, which meant cattle grazing on them gained less weight.

"If you apply inorganic nitrogen or phosphorus fertilisers, soil-forming processes are going to deteriorate, your live weight gains [on animals] are going to be lower," she added.

Fields with more species were also

more resilient to dry weather and natural pests such as insects, she said, because a range of deep root systems connected by a web of invisible fungi meant the soil was much healthier and the plants could draw on a wider range of minerals.

"Ninety-five per cent of the life on your land is in the soil ... and most of the life in the soil is microscopic," Dr Jones told farmers on Lannock Manor Farm, near Stevenage.

Amir Kassam, from the European Conservation Agriculture Federation, said pre-industrial farmers understood the benefits of planting crops together. "In un-mechanised and less mechanised farming systems mixed cropping was very common," he said. "Cereals and legumes is a classic combination. In South America it was maize and beans."

Combine harvesters have made it harder to harvest different crops at the same time, but beef and dairy farmers were well placed to cultivate better pasture, the conference heard.

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