

Experiments with mini-ecosystems show that exotic plants accelerate carbon loss from soils

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A team of researchers affiliated with multiple institutions in New Zealand has found evidence that shows exotic plant introductions can accelerate carbon loss from soils. In their paper published in the journal *Science*, the group describes how setting up multiple mini-ecosystems to learn more about the impact of invasive species on native ecosystems,

and what they learned. Carlos Urcelay and Amy Austin with Universidad Nacional de Córdoba and Universidad de Buenos Aires, respectively, have published a Perspective [piece](#) in the same journal issue outlining the work by the team in New Zealand.

Invasive species of [plants](#) and animals have been in the news recently due to concerns about the impact some of them may have on local ecosystems. In most cases, the consensus has been that such plants or animals tend to disrupt the ecosystems they invade. From a human perspective, the introduction of an invasive species tends to be viewed negatively—new kinds of weeds overtake gardens, new kinds of animals crowd out those that are preferred, or the introduction of new kinds of plant or animal diseases that the invaders bring with them that can lead to problems with [native species](#). In this new effort, the researchers sought to learn more about the impact of invasive plant species on different types of ecosystems.

The work involved building 160 mini-ecosystems on a lab farm in New Zealand—each mesocosm existed inside of a 125-liter mini-greenhouse bag. Each was carefully seeded with native plants, oomycetes and nematodes and scrutinized over a 10-month period as an invasive plant species was introduced. Their study of the mini-ecosystems included taking measurements of key abiotic as well as [biological changes](#). The team also studied changes in the native plants and changes that occurred below the surface in the soil. They included the introduction of some invertebrate herbivores into the environment.

The researchers found, among other things, that interactions between invasive plant species and those that were there originally tended to result in changes to associated bacterial and fungal [species](#) in the soil, along with changes in invertebrate herbivores. Such changes, they noted, tended to speed up the carbon cycle, resulting in faster turnover.

More information: L. P. Waller et al. Biotic interactions drive ecosystem responses to exotic plant invaders, *Science* (2020). [DOI: 10.1126/science.aba2225](https://doi.org/10.1126/science.aba2225)

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