

## Coating seeds with silk that supplies essential nutrients could provide a natural fertilizer to grow crops on unproductive soils

Providing seeds with a protective coating that also supplies essential nutrients to the germinating plant could make it possible to grow crops in otherwise unproductive soils, according to new research at MIT.

A team of engineers has coated seeds with silk that has been treated with a kind of bacteria that naturally produce a nitrogen fertilizer, to help the germinating plants develop. Tests have shown that these seeds can grow successfully in soils that are too salty to allow untreated seeds to develop normally. The researchers hope this process, which can be applied inexpensively and without the need for specialized equipment, could open up areas of land to farming that are now considered unsuitable for agriculture.

The findings are ... published ... in the journal [PNAS](#), in a paper by graduate students Augustine Zvinavashe '16 and Hui Sun, postdoc Eugen Lim, and professor of civil and environmental engineering Benedetto Marelli.

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Not only does this provide a natural fertilizer to the plant crops, but it avoids problems associated with other fertilizing approaches, says Marelli: "One of the big problems with nitrogen fertilizers is they have a big environmental impact, because they are very energetically demanding to produce." These artificial fertilizers may also have a negative impact on soil quality, he added.

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As a next step, the researchers are working on developing new coatings that could not only protect seeds from saline soil, but also make them more resistant to drought, using coatings that absorb water from the soil. Meanwhile, next year they will begin test plantings out in open experimental fields in Morocco; their previous plantings have been done indoors under more controlled conditions.

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