

Bacteria, fungus combo can help crops fight salty conditions

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Credit: Florida International University

Researchers at Florida International University have found coating seeds with a fungus and a bacterium could help valuable crops block the one-two punch of saltier groundwater and soil.

The salt-sensitive snap bean, which contributes more than \$105 million to Florida's economy, is particularly at risk. It is grown in Miami-Dade and Palm Beach counties, coastal communities where underground aquifers used for irrigation and drinking water are threatened by rising seas and saltwater intrusion.

Coating its seeds with the bacteria rhizobium or the [arbuscular mycorrhizal fungi](#) helped snap beans fight wilting and nutritional issues associated with saltier conditions that can lower crop yield.

Coating the seeds with both the bacteria and the fungus worked more like a vaccine to inoculate the plant from salt, said Professor Krish Jayachandran, the co-director of FIU's Agroecology program who directed the study.

"We wanted to see if it can mitigate the salt stress

effects," said Claudia L. Garcia, an agroecology master's student and the study's lead author. "Especially together, these microorganisms could play a critical role in mitigating salt stress in soil."

The bacterium-fungus combination was also found to increase the production of a protein released by the fungus that helps soil clump together to keep from being blown or washed away.

Further research is needed to see how other Florida crops might benefit from the inoculation afforded by the bacteria and fungal concoction.

The study was published in the academic journal [Agronomy](#). It was funded by the U.S. Department of Agriculture—Hispanic Serving Institutions START-NOW Grant.

Prior FIU studies have shown [saltwater intrusion](#) just west of farmland in the Florida Everglades can stress affect plants and trees differently. Bald cypress could experience nutrient stress where they absorb food too quickly or too slowly. Sawgrass might grow larger while their roots wither and die. Mangroves seeking a better balance of [salt](#) and freshwater are fleeing altogether.

More information: Lyl Garcia et al. Effect of Salinity Stress and Microbial Inoculations on Glomalin Production and Plant Growth Parameters of Snap Bean (*Phaseolus vulgaris*), *Agronomy* (2019). [DOI: 10.3390/agronomy9090545](https://doi.org/10.3390/agronomy9090545)

Provided by Florida International University

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