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Selecting rhizobium strains for inoculating common bean

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Common bean roots collected in field experiments showing large amounts of nodules. Photo by Damiany Pádua Oliveira.

After photosynthesis, biological nitrogen fixation (BNF) is considered the most important biological process on the planet. This is a process through which the large amount of atmospheric nitrogen (N_2) present in the atmosphere is converted into forms usable by plants through catalyzation by the nitrogenase enzyme found in nitrogen-fixing bacteria. Bacteria that develop symbiosis with legumes are called rhizobia.

Rhizobia occur naturally in the soil, but legumes benefit from being inoculated with more efficient rhizobia on seeds or roots. These rhizobia must be carefully selected because they vary widely in their ability to efficiently contribute N to the plant; their performance may also be affected by the climate and soil (their environment). Researchers are developing more refined tools to study the effects of this interaction with the environment, including statistical modeling and methods to characterize plant adaptability in various environments.

In the July–August 2021 issue of *Agronomy Journal*, scientists at the Federal University of Lavras are the first to apply these tools for rhizobia selection in field studies with common bean. The authors say these methods can and should be adopted for selecting rhizobia specific to other legume species.

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Oliveira, D.P., Soares, B.L., Ferreira, P.A.A., Passos, T.R., Andrade, M.J.B., Ferreira, D.F., & Moreira, F.M.S. (2021). Selection of elite Rhizobium strains by biometric techniques for inoculation in common bean. *Agronomy Journal*, *113*, 3244–3257.

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