Can a Second Nitrogen Fixing Bacteria Add Value to Alfalfa?

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John Squire is from Utah, where he received a bachelor's and master's degree from USU and then went to Michigan State University to receive a Ph.D. in Crop and Soil Sciences. He lived with his wife and children in River Falls, WI for 24 years, working in the Ag. industry. Working as an agronomist/forage specialist for a LG Seeds, then for Forage Genetics (9 years each), has provided significant background and understanding of alfalfa. John has served as President of the Industry Extension Forage Advisory Council in WI, and alfalfa remains his favorite crop. Additional professional positions include R&D with seed care at WinField United, Research and Technical Lead at YieldMaster Solutions, and is currently the Lead Agronomist for North America at Azotic Technologies.

Envita (*Gluconacetobacter diazotrophicus* [Gd]) is a food grade endophytic bacteria that can colonize and live within most plants – including alfalfa. Discovered over 30 years ago in sugar cane, researchers have studied plant responses to Gd as well as developed flexible ways to inoculate crops. Gd can enter the crop through the leaves, cut stems, and through the root system, forming a systemic (roots and shoots), symbiotic relationship. There is an abundance of published academic literature that discusses the benefits of Gd, and most research has included or revolved around the ability to fix nitrogen. Field observations reveal improved plant vigor, increased yield, and/or quality. Research has also demonstrated increased water use efficiency (WUE) as well as nitrogen use efficiency (NUE) with the use of Gd. Specific to alfalfa, field scale observations and replicated research confirm improved forage quality and in some cases improved yield. A trial conducted by Utah State University illustrated a 20-point increase in RFV on alfalfa following Gd application. Two key quality factors expressed improvement with Gd: CP increased 7% (23.5 control vs 25.2 Gd) and lignin decreased 11% (5.38 control vs 4.85 Gd). If alfalfa already fixes nitrogen in association with rhizobia, how can a second nitrogen fixing bacteria make a difference in protein? Perhaps the systemic nature of Gd reduces the nitrogen translocation costs or provides a slightly extended nitrogen source after harvest to boost CP. Current market premiums justify the use of Gd to enhance alfalfa forage quality. Beyond quality or yield improvements, the use of Gd also offers potential to use less water in alfalfa production. The WUE and NUE components make Gd environmentally attractive to all crops. Field testing confirms improved plant productivity (yield and/or quality) with the use of Gd on crops such as corn, soybean, rice, potato, wheat, alfalfa, sugar cane, casava, cotton, sugar beet, as well as others.