



THE TRIPARTITE SYMBIOSIS HELPS YOU GET BIGGER YIELD

How the tripartite symbiosis can improve crop productivity?

Each phase of the plant growth requires a lot of nutrients and energy to obtain higher yield. “[...] *the tripartite interactions between legumes, AMF [Arbuscular Mycorrhizal Fungi] and rhizobia cause increases in legume productivity, and the N:P:C supply ratio as influenced by the tripartite symbiotic associations plays a fundamental role in controlling the legume’s photosynthetic rate and biomass productivity.*”¹

How do the technologies work? Mycorrhizae develop a network that explores the soil and accesses more nutrients and water to transfer to the plant; rhizobium fixes nitrogen and makes it available to the plant. By working together, they influence positively the plant for increased yield.

¹ Koele et al. 2014. VFRC Report 2014/1, pp. 1-57
² Kaschuk et al. 2009. Soil Biol. Biochem. 41:1233-1244
³ Shinde et al. 2016. Int. J. Bioassays. 5:4954-4957

Help feed the plant

N and P are major nutrients for the plant. “*Tripartite associations of host plants with both rhizobia and AMF [Arbuscular Mycorrhizal Fungi] benefit the host plant by increased P uptake through the mycorrhizal association balancing the high input of N through rhizobial N-fixation.*”¹ In addition, mycorrhizae reach more water and nutrients needed by legumes such as B, Ca, Cu, Fe, K, Mn, Mo and Zn, key components for energy production.

Higher photosynthesis

When used in combination, mycorrhizae and rhizobium increase the photosynthetic rate by 51%². “*The rate of photosynthesis increased substantially more than the C [Carbon] costs of the rhizobial and AM [Arbuscular Mycorrhizal] symbioses.*”² The total increased sugar production by the plant far outweighs the cost to “house” the partners.

Better productivity

Better nutrient use efficiency and bigger biomass result in higher yield from each legume plant (harvest index). For example, “[...] *it has been found that pea plants coinoculated with Rhizobium leguminosarum and AMF [Arbuscular Mycorrhizal Fungi] has shown best results regarding plant height, plant dry mass, nodule fresh weight, number of seeds, seed weight, seed yield, number of root nodules, number of pods per plant, average pod weight and pod length [...]*”³



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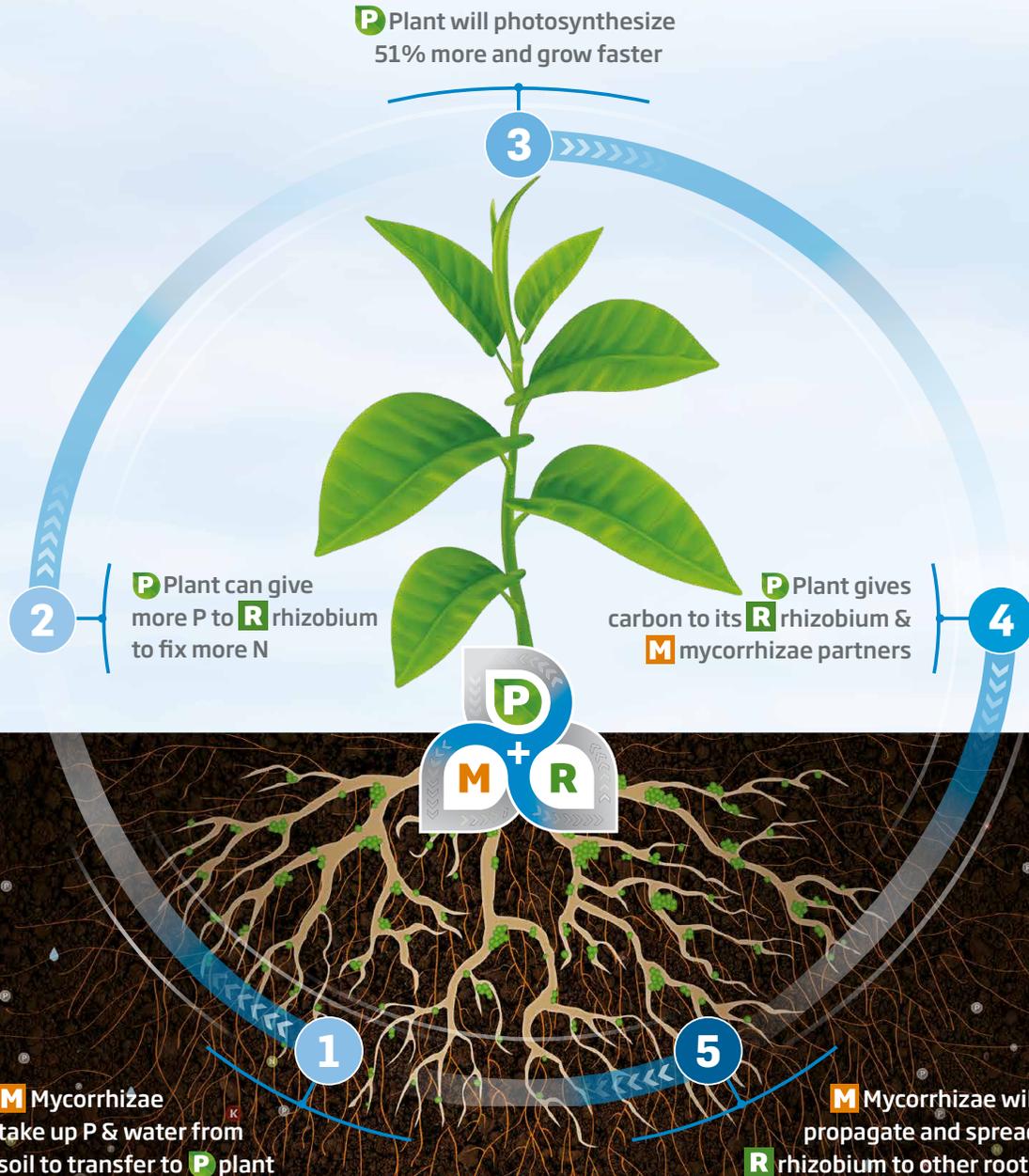
Backed by 35 years of expertise in biological active ingredients, you can count on AGTIV® highly effective inoculants (mycorrhizae and rhizobium) for stronger growth through better plant resistance to stresses, higher yields and superior crop quality.



TRIPARTITE SYMBIOSIS

BIOLOGICAL INTERACTIONS BETWEEN **M** MYCORRHIZAE + **R** RHIZOBIUM + **P** PLANT

By enhancing root system growth and creating a network of filaments, mycorrhizae help plants uptake more water and nutrients, such as phosphorus, and increase the nodulation process for the rhizobium.



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