



Effective Legume Use

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The 7th annual MFGA Re-Gen conference has just wound up and over 250 participants went home with a lot of new information from the conference.

When we look at Re-gen one of the benefits that many practitioners realize is a reduced dependence on fertilizers, with the major one being nitrogen (N).

This reduced N is derived from the atmosphere which is 78% N. If we look closer at this reduced N we see that 90% comes from biological nitrogen fixation, 8% from lightning and 2% from ozone photochemical reactions.

The major portion of the 90% comes from legumes which have a specific group of bacteria that can take gaseous nitrogen (N₂) and reduce it to ammonium (NH₄) which plants can reduce further to build amino acids.

The bacteria that reduces N is called Rhizobium. Rhizobiums live in the root nodules of legumes.

Rhizobium bacteria require energy (sunlight), sugars and a place to live (nodules), in return they will provide the N necessary to engineer amino acids for plant growth.

Because of a legumes ability to add N to the soil it has many roles in Re-gen Ag.

Having legumes in a cover crop mix can add additional N to the soil for the following crop. It can also provide N to other plants in the mix enabling them to perform better maximizing their role in the mix. Finally adding a legume to the cover crop mixture can add to the organic matter in the soil or if cover crops are harvested for livestock feed add to the nutritional value of the feed.

In situations where inter-seeding or over-seeding is a viable option legume play the major role in increasing soil N levels and organic matter levels thus improving the soil.

The third role that legumes have is improving pastures and hay lands. Legumes in a grass/legume mix can provide N to the grasses. Legumes are typically higher in feeding quality compared to grasses and because of these factors can increase the carrying capacity of pastures or the quality of harvested forage.

With the benefits that we see from legumes one would wonder why we should include grasses in today's forage program.

Grasses are highly adaptive to many seasonal fluctuations from drought to flooding. Because of their fibrous roots they help reduce erosion. And when managed they have the potential to smother weeds.

Grasses perform better with the addition of N from the legume in a grass/legume mix. The key is to maintain a balance between the grass and the legume and for the most part this requires management.

As mentioned grass can be used to smother weeds but if not managed it can also smother legumes both in pastures and hay fields. Grazing intensities and cutting heights are some of the management practices that are required ensuring longevity of the legume in the mix.

When it comes to Re-gen Ag and soil health, legumes have a major role to play. They have a role in reducing dependency on nitrogen fertilizer.

They have a role in improving soil health by increasing soil organic matter through their rooting system.

Legumes with a tap root system play a role in improving soil structure and water movement due to their deep roots that open up channels allowing water to move deeper into the soil profile. This increases soil moisture reserves and increases the rate that water can move downwards in the profile which can help reduce the effects of flooding and/or erosion due to heavy rainfall events.

Where salinity is an issue, legumes can play a role in reducing soil salinity because of their deep rooting system and high water use. These traits result in water with the salts being moved downwards in the soil profile below the shallower roots of grasses or annual crops.

The addition of legumes can have major benefits to a farming operation. The challenge is to use them effectively to the betterment of the overall operation of the farm.