Enhancing Soil Health & Farmer Wellbeing with Moraleda Beans

Beans have been cultivated by humans for 6,000 years. Besides Brazil and China, India is the largest producer of beans globally. Ten out of 28 states in India produce this important crop, among them Uttar Pradesh, Madhya Pradesh, Haryana, West Bengal, and Karnataka having a yearly output of 6.000.000 tons[1]. Beans are commonly eaten around the world and are a rich source of fiber and B vitamins, as well as plant-based protein. Beans have several potential health benefits, including reducing cholesterol, decreasing blood sugar levels and increasing healthy gut bacteria.[2]

In addition to the benefits for human health, bean cultivation has potential positive impact on *soil* health. In the pursuit of improving their farm productivity, farmers are faced with the challenge of mitigating climate change effects and at the same time protecting the environment. Maintaining and improving soil health is one effective way to help with these challenges knowing that healthy soil is the foundation of a productive and sustainable agriculture.

Moraleda beans

Research suggests that cultivating leguminous crops such as beans, peas, vetch, or clovers can help fix biological nitrogen levels in the soil which is crucial for plant and crop health. The roots of these legume crops form a symbiotic relationship with nitrogen fixing soil bacteria called rhizobia resulting in the formation of root nodules. These root nodules can convert elemental nitrogen into forms that can be used by the plants.[3]

With these benefits in mind, Vegetables by Bayer is focused on developing seed innovations to support farmers around the world to help enhance soil health, ultimately improving the resiliency of their land and their own lives. We invite you to take a closer look at one of the oldest cultivated foods in the world[4] through the lens of smallholder farmers in India, examining the stories, challenges, and successes of growing high-quality beans.

Helping smallholder farmers understand the potential benefits of intercropping

As the Vegetables by Bayer team in India was working toward the February 2020 launch of the Moraleda pole bean variety, they were committed to finding unique ways to ensure that farmers understood the value that Moraleda could provide. The Vegetables by Bayer team in India came up with the idea to reimagine the positioning of the new Moraleda variety to highlight the potential transformative benefits of intercropping with leguminous crops for growers in the region. "*We identified an opportunity to promote Moraleda as an intercrop to help foster soil health by fixing the nitrogen levels in the soil.*," said Pankaj Range, Zonal Business Lead Sri Lanka, South & West India Bayer Vegetables.

[1] FAOSTAT. Beans Production 2020

[2] North Dakota State University, All About Beans Nutrition, Health Benefits, Preparation and Use in Menus, 2021

[3] Stephen C. Wagner, Biological Nitrogen Fixation, 2011 Nature Education

[4] University of California, Beans: Origin And Development, 2014

Intercropping refers to the practice of growing two or more crops in proximity. The most common goal of intercropping is to produce a greater yield on a given piece of land by making use of resources like fertilizers that would otherwise not be utilized by a single crop.[5]

In many parts of India, farmers previously used local cucurbits and gourds as an intercrop but were struggling due to lower yields, virus incidents, and a lack of market interest. With a better understanding of the benefits of intercropping with leguminous crops, many tomato and grape farmers began to implement the practices by replacing cucurbits and gourd crops with Moraleda pole beans. One farmer in West India expressed: "*During this difficult pandemic lockdown period, the Moraleda beans helped me earn more income through the transformative benefit of intercropping. This not only improved the livelihood of the families on my farm and my own, but this also helps to keep the soil of my land healthy,"* said Mr. Vijay, from Malewadi, Baramati, Dist. Pune, West India. *"I am very happy that I am part of this, and I share this with my fellow farmer friends, so we are able to provide a stable income for our families.".*

Mr. Vijay Nimbalkar from Malewadi

Together, these practices were adopted by around 5000 smallholder farmers in the first two years of the initiative, and it is now becoming a widely accepted model in the region. With the Moraleda bean variety as a vehicle, we were able to help educate smallholder farmers on the potential benefits of using intercropping practices to enhance their soil health, and ultimately, their livelihoods, with little to no additional cost.

"Being able to offer smallholder farmers a product that they can use while incorporating practices that will help them in the long term to use their land efficiently is why we do what we do, and I hope we can continue to advance this approach with other varieties." said Pankaj Range.

[5] European Commission, Natural Water Retention Measures, 2021