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 5.310.000 tons. 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.[1]

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.[2]

With these benefits in mind, Vegetables by Bayer is providing seed innovations to farmers around the world to 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 through the lens of smallholder farmers in India, examining the stories, challenges, and successes of growing high-quality beans.

Helping smallholder farmers generate more income with sustainable solutions of intercropping and relay cropping

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 this new hybrid created added value for farmers and the planet. Aside from the typical crop planting, the Vegetables by Bayer team in India, came up with the idea to reimagine the positioning of the new Moraleda variety to bring transformative benefits to growers in the region. "W*e identified an opportunity to promote Moraleda as an intercrop to help foster soil health by fixing the nitrogen levels in the soil. We've now seen a tremendous impact from these practices*," said Pankaj Range, Bayer Regional Business Manager.

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

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

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 that would otherwise not be utilized by a single crop.[3]

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. By replacing these crops with the Moraleda pole beans, tomato farmers began earning a 23% increase in incremental income compared to their older practices. 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. *"Ever since I used the Moraleda beans as intercrops, the soil is steadily healthy, and the productivity of my land has increased. 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

In addition to tomatoes, Moraleda has proven highly effective as an intercrop with grapes. Based on customer testimonials, farmers earned a 100% income increase over their older practices, using the same infrastructure, reducing tillage, and providing nitrogen fixation in the soil since pole beans are a leguminous crop.

Moraleda bean harvest

Together, these practices were adopted by around 5000 smallholder farmers in the first years of launch, and it is now becoming a widely accepted model in the region. With the Moraleda bean variety, we were able to enhance smallholder farmers' livelihoods in a sustainable way with a significant income boost. These farmers also received the additional benefits of reduced tillage, nitrogen fixation in the soil, and no additional cost for incorporating these new practices.

Pankaj Range with key farmer

"Being able to offer smallholder farmers a sustainable, innovative solution 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 and similar models with other varieties." said Pankaj Range.

[3] European Comission, Natural Water Retention Measures, 2021

ORIGINAL SMALLHODER STORY FOR REFERENCE OR TO BE USED SEPARATELY

In West India, Mr. Vijay Nimbalkar from Malewadi, Baramati, Dist. Pune owns 5 acres of land and lives in a joint family where he is responsible for both the livelihood of his own family and that of four more workers and their respective families. The land is divided into 1 acre for brick production, a small-scale business operation; 2 acres of sugarcane, and 2 acres for vegetable cultivation. With the sudden Covid-19 pandemic and lockdown, their living situation changed dramatically. Previously, Vijay's family and the families he cared for were provided with ample food, shelter, and the children received a good education at a nearby school. With a lack of demand for his products, Vijay, his family and the workers' families were directly impacted financially. In addition, they had faced an unsuccessful growing season in the summer with many losses in summer tomatoes and bottle gourd cultivation.

As lockdown continued, Vijay and his workers faced significant uncertainty in their situation. However, Vijay connected with a friend, fellow farmer and market agent named Kishore, who grew Sarathi tomatoes. Kishore guided Vijay to connect with the Vegetables by Bayer Seminis team. Since there was still little to no demand for bricks in the market given the circumstances of the pandemic, the team found that vegetable cultivation would help Vijay become financially stable and enable him to rebuild his other businesses as well.

Mr. Vijay and his family

The team selected the Virang tomato variety and the Moraleda bean variety, initially both for 1 acre, and started acting—from field preparation to planting. The Moraleda beans were selected given that they are a low investment crop and would pair nicely with the tomatoes, which are cash crops in high market demand.

Mr. Vijay in his fields

Planting was completed in September for both the Virang tomatoes and the Moraleda beans, and within a few days the beans had started to grow. Vijay received excellent feedback in the markets for the beans' high quality, and they started to earn more income for him every other day.

The Moraleda beans helped Vijay during this difficult lockdown period earn money through an alternate source and improve livelihood of this farmer family.

The tomatoes also started yielding produce with excellent keeping quality, and Vijay started to receive steady income for both of his produce offerings in the local Pune market. He utilized the

solid amount of cash he received from the bean and tomato crops to revitalize the wellbeing of his family along with the workers' families. Vijay says he will continue to grow these successful beans and tomatoes in the future and is planning to convert his brick factory into vegetable cultivation in the future.