



Enhancing productivity and empowering smallholder farmers in Asia and Africa with tomato hybrids

Tomatoes are one of the most profitable crops and the second most widely produced vegetable in the world, with 251 million tons produced in 2020 (FAO). Known for their high vitamin and nutrient content, including the antioxidant lycopene, tomatoes also provide many benefits for human health and nutrition. Yet, ensuring that a tomato crop yields high quality fruit that makes it all the way from the field to the plate is no easy feat. This is particularly true in low and middle-income countries where smallholder farmers are responsible for feeding more than half of the population. As part of its robust vegetable seeds portfolio, Bayer has introduced tomato varieties tailored to smallholder farmers in countries like India and Kenya that are providing higher yields, increased economic stability and enhanced sustainability across the value chain.

During this year, [the UN International Year of Fruits & Vegetables](#), let's take a closer look at one of the most important foods in the world through the lens of smallholder farmers, examining the stories, challenges, and successes of growing high-quality tomatoes.

Enhancing productivity and combating food loss in India

Our journey begins in India, where tomatoes serve as a central part of local cuisine. Nearly one million hectares of land are dedicated to growing this essential crop. Despite their importance, as much as [40% of all tomatoes grown in India](#) are lost before they reach market stalls or supermarket shelves. This is a significant loss not just in terms of nutritional food to feed a growing population but also in income for smallholder farmers.



The Virang tomato hybrid.



Nidhi Sakya, smallholder farmer growing Abhilash tomato in Uttar Pradesh, India.

At Bayer, we are committed to tackling these problems head on. Our team of scientists and breeders have developed and commercialized several tomato hybrids, including [Abhilash](#) and [Virang](#). The hybrids each have a [12-to-14-day shelf life](#) compared to the typical 5-to-7-day time frame of conventional varieties, which not only helps reduce the amount of food lost during transport but also helps smallholder farmers achieve better profitability and more stable incomes as their product will reach the market in healthier condition. Abhilash is one of India's leading hybrid tomato seed varieties and has gained the implicit trust of farmers. Since its launch in 2011, Abhilash has helped more than 500,000 tomato farmers in India enhance their crop productivity and farm incomes given its high yield performance and high marketable fruit quality. Nidhi Sakya, a 28-year-old smallholder farmer from Uttar Pradesh, India, has been growing the Abhilash hybrid for over three years. "I faced challenges in retaining the quality of the tomato yield and further I lacked knowledge of good agricultural practices. This is where Bayer came into the picture with the right agri-

inputs, timely crop advisory and training on modern agricultural practices. I was able to increase my family's income, provide better education to my children and provide adequate medical care for my husband who is recovering from an accident."



Smallholder farmer Tukaram Gunjal, and his family, produce Virang hybrid tomatoes on their land in Nimaj, India.

Tukaram Gunjal also enjoys the benefits of the Virang hybrid variety, producing these tomatoes on his family's land in Nimaj. Like the Abhilash, the Virang variety is preferred with growers and market yard traders due to the fruit's firmness and deep red color. These characteristics make it the best variety for transportation. With its market appeal and endurance during transportation, the Virang tomato equates to less losses and greater income to growers.

Nidhi and Tukaram's stories are only two of countless others across India that demonstrate the powerful impact that high-quality seeds and solutions, coupled with training and know-how, can bring to a farmers' operation and to enhancing the sustainability of the value chain.

Hybrid Tomato in India

Traditional tomato varieties tend to have a relatively short shelf life, that can result in spoilage and food loss during transport to remote urban markets. In a study for Bayer, Wageningen University in The Netherlands analyzed a new hybrid tomato variety, the Ansal, with increased shelf life and thicker cuticle that is developed to allow for long-distance transport under ambient conditions. Measurements showed reduction of losses in a typical postharvest chain from about 30% to less than 10% in the Ansal tomato. A climate impact analysis by the [Agro-Chain Greenhouse Gas Emissions \(ACE\) calculator](#) revealed that this results in substantial reduction of greenhouse gas emissions per tomato sold to consumers due to the hybrid's ability to withstand long transport times and arrive safely to their destination in good condition.

For more information about Ansal, visit this [WBCSD Case Study on Tackling Food Loss & Waste](#).

Extending the growing season in Kenya

The benefits of this tomato seed innovation can also be seen in Africa where Bayer was recently recognized as the [#1 global seed company](#) in the Western, Central, Eastern and Southern African regions for providing access to high quality seeds for smallholder farmers.

Grown across more than 13 countries, the [Ansal tomato](#) variety is another example of a hybrid that has developed a strong reputation for its great transportability and resistance to bacterial wilt. These qualities enable farmers to produce tomatoes year-round, giving farmers continuous income across the entire crop life with a harvest period of up to 8-12 weeks. Like the Abhilash and Virang varieties, Ansal has improved fruit firmness and a longer shelf life that makes it easy to transport over long distances once harvested reducing food loss. These factors are very beneficial to market traders as they can store the fruits for up to 21 days. They also play a key role in reducing post-harvest losses and waste at farm level.

With these improved traits in mind, the Ansal tomato variety has been widely adopted by farmers in Kirinyaya County, Kenya, and other parts of the country. Farmers in this region were previously facing numerous challenges in accessing quality tomato varieties with intermediate resistance to bacterial wilt. The farmers who have adopted this variety are now able to sustain year-round tomato production as opposed to the single season production previously experienced. As a testimony to this, one farmer in Kenya commented: “The fruits were amazing and even the few seedlings that had been neglected are coming through strong. Now I have transplanted over 12 acres of Ansal, and I plan to do 10 more acres in the coming months.”

Combatting disease with more resilient varieties



Tomato DRD 8551

Another big success is the Tomato DRD 8551 variety introduced in Rumuruti-Lakipia County, Kenya. Rumuruti is an area in Kenya that is famous for tomato production but also receives torrential rainfall during the main rainy season (May and July). This wet weather presents numerous challenges, especially with diseases that affect tomato production resulting in production losses to the smallholder farmers. Choosing a strong and resilient variety is key to not only surviving the wet season but ultimately optimizing recurrent premium prices at the market as disease pressure normally leads to a premium tomato price due to reduced production by farmers during the rainy season.

Tomato DRD 8551 has resistance to tomato yellow leaf virus, and with the plant type being semi-determinate, it gives farmers better foliage cover that can enhance performance despite prevalent environmental challenges. This variety has given farmers in Kenya higher yields compared to the other tomatoes, as well as a uniform harvest (uniformly sized tomatoes across the cluster) which helps increase farmer incomes. Further, the DRD 8551 variety

gives farmers preference in the market as traders prefer its sustained quality and attractive fruit color and size, which range from 120-135 grams.

Adoption of this variety in Kenya has transformed the livelihoods of smallholder farmers and their farming operations. Peter Kirumba is one farmer who has adopted the Tomato DRD 8551 variety. “I was slow to adopt the variety although I could see my neighbors growing the variety for the first season. I started on a small portion of my land through sample seeds from the supplier as I was still unsure. After experiencing the performance from this portion, I expanded my production to 3 acres at first and now am growing in more than 7 acres of DRD 8551. I have been able to buy a personal car for my own use and farm operations, I have expanded my business and farm by acquiring more land in the area, I have been able to educate my children and created permanent employment in the region. All this has been possible due to the proceeds of DRD 8551.”

Advancing healthier businesses and a healthier world

By developing innovative vegetable seeds, Bayer and its Seminis and De Ruiter brands are working to enhance crop productivity in a sustainable way while improving the livelihoods of farmers like Nidhi, Tukaram and Peter, as well as their families and communities. With tomatoes being one of the world’s most popular and widely produced vegetables, we seized the opportunity to create tomato hybrids with longer shelf lives and higher yields, helping farmers achieve better profitability while combating food loss and food insecurity. Through collaborations and innovations on and beyond the farm, we will continue to provide smallholders with the solutions they need to grow healthier businesses and a healthier world for generations to come.