

Nutritional Superstars: How Bitter Gourd and Okra are Adding Value to Smallholder Lives in India and Southeast Asia

With the increasing demand for high-quality, nutritious fruits and vegetables around the world, Bayer and its Vegetable Seeds business is focusing on innovative, next-generation hybrids suited to meeting consumer tastes and preferences. As part of its robust Vegetables by Bayer portfolio, Bayer has recently expanded its investment in crops like bitter gourd and okra due to their excellent nutritional benefits, as well as their significant role in the diets of millions around the world. The new breeding programs, which have been underway for the last year and half, are focused not only on breeding varieties to meet consumer preferences but also those that enable increased yield potential, more sustainable production and increased economic stability potential for the smallholder farmers who grow them.

The new breeding programs in bitter gourd and okra are just one example of how Bayer is working to advance its commitment to empowering 100 million smallholder farmers in low- and middle-income countries by improving access to agronomic knowledge, products, services, and collaborations. Let's learn more about these burgeoning breeding programs and their benefits to growers, communities, and the value chain.

// The rise of bitter gourd and its benefits for Indian communities

Bitter gourd (*Momordica charantia*) is one of the most popular and important cucurbit vegetables grown and consumed in India and Southeast Asia.¹ The crop belongs to a family of annual as well as perennial climber plants and is a staple of daily cuisine in many parts of the world. While it is considered an "orphan crop" since it is not traded internationally, and therefore tends to get less attention in terms of research and training, bitter gourd brings countless health benefits and plays an important role in promoting biodiversity.²



Bitter Gourd - SHBG-48 Hybrid

In addition to its great nutritional attributes, such as the high ascorbic acid and iron content, as well as a considerable amount of carbohydrates, fats, minerals and vitamins (A, B2 and C), bitter gourd is known for its strong medicinal values.³

The bitter gourd produce market in the Southeast Asian region is very successful and is growing. Given the significant demand for bitter gourd in many countries, smallholder farmers often depend on it as a

¹ M.Rahaman, 2015

² FoodInsight, "Orphan Crop", 2015

³ M.Rahaman, 2015; R.Shankar et. al., 2009

safety net, yet they face many challenges in ensuring a healthy and productive harvest. One part plays the tremendous increase is the awareness of its health benefits.

With these needs in mind, Bayer’s Vegetable Seeds business has reinvigorated its investment in a breeding program for bitter gourd with new products in the pipeline, in addition to its long running Abhishek variety. Bayer’s breeding program is working towards improving the resistance of bitter gourd seeds to viruses and foliage disease which helps farmers grow more resilient and productive crops.



Team evaluating set of hybrids from new bitter gourd breeding plan

The team is also working towards improving fruit quality with respect to color and firmness as these added value traits garner a potential increase in price in the market for smallholder farmers.

// Customer Spotlight: Bitter gourd serves as a staple income source

One of the many farmers who depend on the Seminis® brand bitter gourd varieties as an important source of income potential is Mahindran. Mahindran is a grower from Unathur village in Thalaivasal Taluk, India.

“I am doing farming for 15 long years. I have cultivated Abhishek bitter gourd from Seminis. The yield is good, and it is easy for marketing. Traders buy our bitter gourd without any hesitations. I encourage other farmers to cultivate Seminis Abhishek bitter gourd if you are interested in cultivating bitter gourd.”
- Mahindran, Unathur village

In addition to Mahindran’s story, is a farmer from Raikot Road, Malaikotla, in Punjab, India. He summarized his positive experience with the bitter gourd hybrid SBGH-48:

“I have grown SHBG-48 for the past 4-5 years, and it is very good in color, it gets good germination and yields 15-20 days faster than other hybrids. It gives good yield, and we get good prices in the market for this hybrid.” – Mahindran

These stories represent just a snapshot of the potential benefits high quality bitter gourd varieties can provide smallholder farmers and reinforce why Bayer is increasing its focus on this important crop.

Bitter gourd is not the only crop that offers plenty of benefits to smallholder growers and consumers alike, okra is another staple with significant nutritional benefits and economic potential.

// Okra – how an ancient vegetable boosts the market in India

Okra (*Abelmoschus esculentus*), also known as the lady’s finger, bhindi, gumbo and other names, is a seed-propagated, hot weather crop that belongs to the Malvaceae family. As one of the important vegetable crops cultivated throughout India, okra is adaptable to different kinds of soil conditions and is easy to cultivate, in part due to its lower susceptibility to pest and disease damage. Furthermore, okra is considered by many as a super-vegetable with a lot of nutritional benefits.



Okra vegetable

It is rich in soluble fibre, vitamin B6, folic acid and other nutrients. Soluble fibre helps to reduce serum cholesterol, thus reducing the risk of heart disease. Fibre also helps in stabilising blood sugar. The mucilage not only binds cholesterol but also the bile acid carrying toxins dumped into it by the liver. In fact, okra’s slippery characteristics facilitate the elimination of excess cholesterol and toxins from the body.⁴

Similar to bitter melon, the okra market is expected to grow in the region. India is one of the largest producers of okra in the world in 2020 their production volume amounted of 6.371.000 tn.⁵ Okra is available in India throughout the year and is grown throughout the country except in mountainous regions. The major producers are West Bengal, Bihar, Orissa, Andhra Pradesh and Gujarat.⁶ Some of the important varieties of okra are Pusa Makhmali, Pusa Sawani, IIHR 20-31, Pujab Padmini, Arka Anamika, Parbhani Kranti, Selection-2, ArkaAbhey etc. For export purposes, hybrid varieties are mostly used, such as Sobha, Vaishali and Azad Kranti.⁷

Bayer’s okra breeding program is part of its continued commitment to tailoring its solutions to the needs of smallholder farmers. The focus of the breeding program will be on delivering virus-resistant hybrids with short internode plant types to better meet grower demand and enhance productivity, and improved fruit quality for consumers.

⁴ Product Profiles of OKRA , 1/11/2020

⁵ FAOSTAT. (o. D.). FAOSTAT. <https://www.fao.org/faostat/en/#data/QCL>

⁶ Dr. Vigneshwara Varmudy, Need to boost okra exports, 2011

⁷ Product Profiles of OKRA , 1/11/2020



Anita Verma, Okra and Bitter Gourd
Breeder, India

“It is the goal of the Bayer okra program to work towards enhancing the productivity of crop that is anchored in the culture and diet of millions. Not only is it richness in nutrients, minerals, and fibers but it also has a natural resistance to many biotic stresses. By establishing this breeding program, it is our goal to increase productivity and in turn create positive socio-economic impact on smallholders and their communities. I am very thrilled to be part of this program as a breeder myself and as part of the Vegetables by Bayer team.”

– Anita Verma, Okra and Gourd Breeder, India

// Working Towards Advancing Healthy Businesses and a Healthy 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, as well as their families and communities. With bitter gourd and okra being one of India’s most popular and widely produced vegetables, we seized the opportunity to create hybrids with longer shelf lives and increase yield potential, helping farmers achieve increased profitability potential while having a positive socio-economic impact on local communities. Through collaborations and innovations on and beyond the farm, we will continue to provide smallholders with the solutions they need to Working Towards Advancing Healthy Businesses and a Healthy World for generations to come.