

CASE STUDY 5

Tackling food loss and waste

The tomato hybrids with double-shelf-life to address India's transport challenge

One-third of food produced is never consumed: this represents 8% of global greenhouse gas emissions (GHG) and a quarter of the water used in agriculture, as well as crop-land the size of China. Strong business, social and environmental drivers to tackle post-harvest loss and food waste include reducing nutritional loss across the key value chain stages from production to consumption, financial savings, resource use

efficiency, higher performance and contribution to climate targets, food availability and better returns on investments for actors involved.

WBCSD is collating this series of case studies to scale private-sector action that tackles post-harvest loss and food waste through fostering more knowledge-sharing and peer-learning.

Case studies will be made available at www.wbcspd.org



The context

Bayer is a German science and innovation business, and one of the largest pharmaceutical companies in the world.

Crop Science is a business division of Bayer. It works to develop new varieties of vegetables and farm crops with better field characteristics for growers and their environment and better suited to consumer needs, and to find new ways to make the application of crop protection products safer so that risks can be minimized and impacts can be maximized, both in the field and along the supply chain.

The business develops solutions for agricultural sustainability by improving the conversion of inputs to outputs, and making sure crops are tolerant to environmental impacts, such as flood, drought and pests.

Central to this is the company's commitment to dealing with food security and post-harvest loss through innovative crop solutions, as well as seeds and traits that help to boost productivity and improve the livelihoods of farmers.

The transport challenge

In India, post-harvest food losses come as a result of high temperatures during the harvest period and the long time it takes to get produce from the field onto trucks and into supermarkets, often without any refrigerated transport or storage.

Smallholder farmers will often consolidate their daily field harvests to make up larger loads for transportation. This means the food-waste clock is already ticking much faster than is common in Europe or the US. What might be a three-day, refrigerated journey from harvest to supermarket in Spain, could easily be a seven-day journey to a local produce seller in India.

Poor road surfaces, traffic congestion and packing crates that are lined with newspaper rather than air cushions exacerbate the problem, particularly for the tomato-growing sector. Around 1 million hectares of land are used for growing tomatoes in India. But as much as 40% of the tomatoes are lost before making it to small market stalls or supermarket shelves.

Phenotyping technology

Bayer's team of scientists and breeders identified two key factors contributing to the spoilage of tomatoes: shelf life and the firmness required to survive the journey from field to market, all the while maintaining the flavor and color quality demanded by retailers and consumers.

By using conventional breeding techniques supported with advanced phenotyping technology, for example a Durameter (Agrosta-100) which calculates the amount of pressure required for the fruit to push back when subjected to the instrument, the company has developed a solution.

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An improved shelf life

In parallel, Crop Science spent two years studying more than 500 tomato genotypes to evaluate their traits and suitability for being transported to enable breeding and selection of the best-suited varieties. This led to the development and commercialization of two new tomato hybrids, known as Ashoka and Garv, in 2015. Then, a further two hybrids, Ansal and Virang, were bred for launch in 2017.

The new tomato varieties benefit from a 12-14 day shelf life, compared to a typical 5-7 day timeframe within which tomatoes would normally spoil.

Garv is also a very firm product and yields 20% more fruit in comparison to competitors. Ansal has a greater adaptability to heat stress and produces fruit with an attractive red color which consumers love.

Opening up the market

While tomatoes remain a popular staple crop for millions of people living in rural India and China, these types of innovation can help farmers stabilize their income and make more money from their produce which is able to last longer to reach markets more reliably and in a more saleable condition, and look and feel better.

Improving the shelf life of tomatoes has also opened up the market in India, with growers all over the country able to produce the fruit, rather than just those in the central regions close to the markets.

Keeping up with a changing planet

As climate change-related impacts are felt differently across the world, Bayer will continue to develop crop varieties and solutions that can tolerate drought conditions, or survive if the monsoon rains are later. Right now, it is running field trials for plant tolerance to a significant virus that has spread around the world in a matter of two and a half years as a result of changing weather conditions and global trade routes.



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ABOUT WBCSD

WBCSD is a global, CEO-led organization of over 200 leading businesses working together to accelerate the transition to a sustainable world.

We help make our member companies more successful and sustainable by focusing on the maximum positive impact for shareholders, the environment and societies. Our member companies come from all business sectors and all major economies, representing a combined revenue of more than USD \$8.5 trillion and with 19 million employees.

Our Global Network of almost 70 national business councils gives our members unparalleled reach across the globe. WBCSD is uniquely positioned to work with member companies along and across value chains to deliver high-impact business solutions to the most challenging sustainability issues.