Plants for the Future
European Technology Platform

Adapting to a changing climate

NGT CROPS FOR RESILIENT AGRICULTURE

RICE

A variety of rice, developed by the **Indian Council of Agricultural Research (ICAR)**, DRR Dhan 100 (Kamala) is one of the world's first genome-edited rice varieties. It matures 15–20 days earlier than its parent variety (Samba Mahsuri), **helping farmers save water, reduce methane emissions, and harvest earlier**. The variety also offers a **19% yield increase, enhanced drought tolerance**, and stronger stems to prevent lodging. This rice is **expected to become commercially available within the next two years**. In the meantime, ICAR is training farmers and conducting demonstration trials across India. DRR Dhan 100 exemplifies how gene editing can support more sustainable rice production in a changing climate.

BELL PEPPER

Peppers are the second-largest vegetable seed market globally, making them a valuable target crop. Developing a **bell pepper that can withstand drought conditions** is critical for open-field cultivation where water availability directly impacts yields. This is one of **ToolGene**'s objectives, a Korean company that amongst developing many other gene edited crops, is currently conducting field trials on their CRISPR-developed drought-tolerant bell pepper, which is **estimated to be commercialised in the next 3 to 5 years**.

BROCCOLI

Grupo Lucas in Spain is testing a new gene-edited broccoli variety that **can grow better in salty or dry soil**—conditions that are becoming more common with climate change. The goal is to **ensure that farmers can keep producing healthy vegetables even when water is scarce or soil conditions are tough**. Field trials have been requested to evaluate how well this broccoli performs outside the lab.

YELLOW PEA

US-based company **GreenVenus**, in partnership with New Zealand's **Plant Research Ltd**, is developing next-generation yellow peas using proprietary gene editing and machine learning. Their goal is to create high-yielding, climate-resilient pea cultivars tailored for plant protein markets. These varieties will **better withstand weather extremes and disease**, while producing clean, taste-neutral proteins for human and pet food. The project aims to support sustainable diets and improve grower profitability through better-adapted crops.

SOYBEAN

GDM, a leading seed company in Argentina, is developing a gene-edited soybean variety that maintains growth under water stress by disabling a gene responsible for the plant's drought-response inhibition. The resulting variety is expected to show **improved productivity in dry conditions**, such as those experienced during 'veranicos'—short droughts with high temperatures—in southern Brazil. **Commercial launch is planned for the 2027/2028 harvest**, with early demand anticipated in water-stressed regions like Rio Grande do Sul.

CANOLA

Canola is an oilseed crop widely grown for its light, heart-healthy cooking oil and for use in animal feed. **Cibus Inc.**, a USA-based company, is developing a gene-edited canola variety that can **absorb nutrients, particularly nitrogen, more efficiently**. Nitrogen fertiliser is commonly used in agriculture, but a significant portion is often not absorbed by plants and is lost to the environment, contributing to pollution and greenhouse gas emissions. **By improving the plant's ability to take in nitrogen more effectively, this variety could help reduce fertiliser use** and lower the environmental impacts while still maintaining good yields. The plants are currently being tested in controlled environments.

NGTs can help us develop more resilient crops in the face of climate change

Climate change is already significantly impacting agriculture globally, with more frequent droughts, floods, and extreme weather events threatening crop yields and farmer livelihoods. In regions like southern Europe, yields of non-irrigated crops such as wheat, maize, and sugar beet could drop by up to 50% by 2050 due to these phenomena, exacerbating food security challenges. Conventional crop breeding, while important, takes at least a decade to develop more resilient varieties.

New Genomic Techniques (NGTs), provide a faster and more precise approach to developing climate-resilient crops. By enhancing drought, heat, salinity, and nutrient tolerance, NGTs can help farmers better manage unpredictable growing conditions, reduce the need for inputs, and increase sustainability. These innovations can bring resilient varieties to market more quickly, helping ensure food security and support farmers in the face of climate challenges, as well as help stabilise supply chain availability and food prices.

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