

GENE EDITING FACTS

To achieve our vision of “a world where the best quality seed is accessible to all, supporting sustainable agriculture and food security”, ISF believes that science and innovation must continue to flourish. The latest plant breeding methods can accelerate the improvement of seed varieties for the benefit of agriculture and consumers globally.

Gene editing is a new tool in the plant breeding toolbox

Plant breeding is a collection of scientific disciplines. It involves many different tools all used to develop plants that meet the needs of farmers and the needs of a changing world. These tools provide solutions to global challenges by developing improved varieties that are better adapted to withstand diseases, pests, climate change, and other threats and offering better quality.¹ Gene editing is one tool that plant breeders and scientists use to develop new varieties more efficiently.

A HISTORY OF INNOVATION

Since the first seed was planted, farmers have continued to selectively breed and grow the best and heartiest crops. As the world and science progresses, so does breeders' understanding about plants and the breeding process. They have continued to be more efficient in choosing which crops to breed and in identifying beneficial characteristics to grow heartier, tastier, and more pest-resistant varieties. This was evident in the mid-20th century when Norman Borlaug led the first Green Revolution, leveraging humanity's knowledge of plant breeding to double wheat yields, feeding billions globally.²

CONTINUING THE TRADITION

Now, in the early-21st century, we're witnessing another leap in plant breeding innovation. The tools may be different, but the goal remains: Grow what the world demands with the least resources possible, while adapting to a changing world. Gene editing is a natural addition in the continued improvement of plant breeding. Because of its increased precision, gene editing can allow breeders to adapt more quickly to address the new and emerging global challenges of today and tomorrow.

UNDERSTANDING PLANT BREEDING

Plant breeding is the science of developing new or improved characteristics in plants. Whether breeders use traditional crossing and selection or gene editing, these tools allow the development of characteristics from within the plant's own gene pool. Gene editing is built on the foundation of conventional plant breeding tools and their long and safe history of beneficial use.

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While gene editing is a new plant breeding tool, it does differ from classical genetic engineering. In agriculture, classical genetic engineering is most often used to introduce desired characteristics that are outside of the plant's gene pool. These plants are commonly called GMOs (genetically modified organisms). While gene editing can be used to develop GMOs, plant breeders more often use gene editing within the existing genetic diversity they normally use, also known as the breeders' gene pool, to develop improved characteristics.³

THE BOTTOM LINE

Gene editing is plant breeding

Gene editing is part of plant breeding innovation. It builds on years of tradition and is the result of advanced science and understanding of plant genetics. Gene editing allows breeders to work within a plant's own gene pool to try to reach the same endpoint as they would through more traditional breeding methods—but with greater precision and efficiency. With reasonable and differentiated regulation, the contribution that gene editing can make will only increase, creating a better future for the environment and global food security.

1. The economic, social and environmental value of plant breeding in the European Union. http://www.plantetp.org/system/files/publications/files/hffa_research_paper_03_16_final_unprotected.pdf

2. Borlaug, et al. (1969). A green revolution yields a golden harvest. *Columbia J. World Business*, 4, 9-19.

3. Scientific opinion addressing the safety assessment of plants developed through cisgenesis and intragenesis (2012). *EFSA Journal*, 10(2), 2561.