

*Plant
Breeding*

FREQUENTLY
ASKED
QUESTIONS

INNOVATION

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1. What is plant breeding innovation? Through evolving plant breeding methods that work within the genetic makeup of plants' own families, plant scientists and breeders provide farmers with seeds that can thrive despite challenges, such as changing weather, plant disease and pests, while reducing crop inputs. Newer plant breeding methods such as gene editing build on what plant scientists and breeders have been doing for years and allow us to reach the same endpoint more precisely than traditional methods.

2. How is a plant developed through new plant breeding methods such as gene editing different from a GMO (genetically modified organism)? Newer methods like gene editing can work within the genetic makeup of a plant's own family to produce a new variety. A GMO is a plant with genetic material from another organism that has been inserted by genetic engineering techniques. Both are important tools to deliver improved varieties that enable soybean farmers to produce more with less.

3. What is gene editing? Gene editing is an example of plant breeding innovation that allows plant scientists and breeders to precisely make specific changes to a plant's DNA using a plant's own internal processes. Like traditional breeding methods, through gene editing, plant breeders and scientists can develop new varieties without incorporating foreign DNA. CRISPR-Cas9 is one example of a gene editing tool.

4. How does plant breeding innovation benefit soybean farmers? For soybean farmers to grow more using less, they need a variety of seed choices to solve their local needs, manage

changing weather, fight plant disease and pests, and wisely use crop inputs and natural resources.

5. How will plant breeding innovation impact the soybean industry? By using naturally occurring characteristics within the soybean plant's own family, plant breeding innovation can help farmers become more sustainable by producing soybeans while using fewer resources. It may also deliver varieties with an improved nutritional profile to better meet the needs of end users. All of this could result in new and expanded markets for U.S. soy.

6. What is the United Soybean Board's (USB) role in supporting plant breeding innovation? USB supports plant breeding innovation as part of its vision to drive soybean innovation beyond the bushel. The potential for plant breeding innovation contributes to the U.S. Soy Advantage of exceptional composition, consistent supply, sustainable farming practices and innovation. USB is working with the seed industry and the American Seed Trade Association (ASTA) to communicate the benefits of plant breeding innovation for farmers and end users of soy and is providing educational resources to decision makers.

7. Will seed varieties developed through plant breeding innovation be regulated? All foods derived from plants are regulated in the U.S. by the Food and Drug Administration (FDA), and seeds are comprehensively regulated by the U.S. Department of Agriculture (USDA). Global regulatory policies for products of plant breeding innovation are currently under development. In the U.S., USDA has released a proposed rule-making notice that would revise its biotechnology regulations and FDA has issued a request for information on new plant varieties developed through gene editing

techniques. ASTA and others in the seed industry continue to engage with oversight and regulatory agencies as both the domestic and international discussions continue.

8. Will farmers in other countries have access to varieties developed through plant breeding innovation? The seed industry and agriculture in general are global. Research collaborations and plant breeding efforts cross country boundaries. Global regulatory policies for products of plant breeding innovation are currently under development. Farmers in other soybean-producing countries will also have access to products developed through plant breeding innovation, as long as the products meet the regulatory requirements and policies of their country and key export markets. ASTA and the International Seed Federation are working with governments and international organizations to avoid creating new trade barriers or disruptions due to inconsistent or non-science based policies or practices.

9. Is gene editing technology also being used in animal agriculture, a key market for U.S. soy? Following in the footsteps of traditional breeding, scientists say gene editing technology can boost the sustainability of livestock production, while also enhancing livestock health and welfare. Gene editing technology has already been used to prevent livestock disease, including making pigs resistant to some viruses, and to improve animal welfare by developing dairy cows that don't require horn removal. Research is underway on other applications, although it is not yet clear what regulatory status livestock produced with gene editing will have.