



Asia and Pacific Seed Association (APSA)

Position Paper

on

Plant Breeding Innovation (PBI)

Context

Plant breeding is a product-oriented, science-based discipline for improving plants to meet the ever-changing needs of the value chain from farmers to consumers. It addresses significantly climate and agronomic challenges faced by farmers (diseases and pests, agronomic performance, abiotic stresses such as drought, salinity, heat, etc.) which ultimately impact food security for consumers all across the world. End users that require specific quality and nutritional characteristics (e.g. healthier oil profile, different color of the fruit) also benefit from plant breeding. Today's plant breeding methods are based on the gradual accumulation of knowledge and understanding over the centuries about plant physiology and more recently genetics. Many of these latest tools often appear under the umbrella terms as "plant breeding innovation (PBI)" or "new breeding techniques (NBT)" and include, for example, genome editing. The latest tools (such as targeted mutagenesis and CRISPR-type genome editing) which are available to breeders today enable them to efficiently and precisely trait development and introgression, as well as more efficient integration of genetic diversity in breeding programs. Their use can help breeders to produce novel traits through introduction of genetic changes that are targeted instead of random in the genome and this helps breeders to add speed, precision and efficiency to their breeding programs. Also, some of these plant breeding innovations produce genetic changes that are similar to changes spontaneously occurring in plants (e.g. natural mutations) or obtained by earlier established plant breeding techniques.

Opportunity for Innovation

Latest plant breeding methods rely on the knowledge about the DNA sequence of the crop. With the ever-increasing sequence information becoming available from different crop species, it becomes more and more feasible to identify desired trait combinations and to integrate them into the desired breeding lines in a much more straightforward way than in the past when sequence information was not yet available. Precise genetic changes based on knowledge and understanding of the functioning of the plant's own genome, or the genomes of its cross compatible species are of a great opportunity to apply the knowledge that has been accumulated from sequencing of plant genomes into practical applications that would allow breeders more readily deliver desired varieties to farmers, actors of the value-chain and consumers.

The successful deployment of these very promising latest methods is very dependent on an enabling regulatory environment that supports innovation in traditional plant breeding.

Position

The Asia-Pacific seed industry believes that the adoption of science-based, consistent policies for the regulation of products derived from the latest plant breeding methods (e.g. CRISPR-mediated genome editing) across Asia would facilitate the development and deployment of advanced, innovative breeding applications by private and public breeders and benefit the region's agricultural economy across the entire value chain, from farmers to consumers.

Criteria for the scope of regulatory oversight

The Asia-Pacific seed industry believes that the underlying principle for determining the regulation of the latest plant breeding methods such as genome editing should be that *Plant varieties developed through the latest plant breeding methods should not be differentially regulated if they are similar or indistinguishable from varieties that could have been produced through earlier plant breeding methods.*

The following principles should also be applied to the regulation of the latest plant breeding methods such as genome editing by all Governments in the Asia region:

- Plant breeders need legal certainty supported by stable & clear government policies.
- Regulations should be formed on sound scientific principles.
- Disproportionate regulations and associated costs will impede the utilization of innovative breeding methods.
- Government policies should facilitate innovation and utilization of advanced breeding tools by public and private plant breeders both in developed and developing countries.
- Harmonized policies at international level are essential for both international research collaboration and trade. There is a critical need for consistent, aligned, national regulation in this area, as a patchwork of different, non-aligned national regulatory frameworks could limit developers from bringing innovations to market, delay the introduction of new sustainable farming tools to growers, and lead to potential trade disruptions. APSA is willing to participate in, and can help to facilitate, regional policy discussions on these issues.

As a general rule, we believe that the final plant product derived from the latest plant breeding tools such as genome editing should not be covered under the scope of existing biotechnology/ Genetically Modified Organism (GMO) regulations for plants if the:

- a) There is no novel combination of genetic material (i.e. there is no stable insertion in the plant genome of one or more genes that are part of a designed genetic construct), or;
- b) The final plant product solely contains the stable insertion of genetic material from sexually compatible plant species, or;
- c) The genetic variation is the result of spontaneous or induced mutagenesis.

Call to Action

APSA calls on its members to use this position paper to reach out to their respective governments and request certainty, scientific rationale and harmonization in the regulation of plant breeding innovations such as genome editing, to ensure that the region can best address the significant climate and agronomic challenges being faced by Asian farmers now and into future.

Resources provided by International seed federation (ISF)

<https://www.worldseed.org/resources/faqs/#plant-breeding-innovation>

<https://www.worldseed.org/resources/papers/plant-breeding/>

<https://www.worldseed.org/our-work/plant-breeding/>

Resource provided by APSA

https://apsaseed.org/wp-content/uploads/2018/12/APSA_Poster_Sep2018_18x24_v5A_PBI.pdf

<https://www.youtube.com/watch?v=ZRlxbagsVws&t>

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