

# Different strategies for cultivar development

- › **Conventional breeding:** **Status quo**
  - › Selection with application of seed treatments, herbicides, optimal nutrient supply
  - › Breeding goals and variety development for conventional / IP farming
  - › Test registered varieties under organic farming (organic variety trials)
- › **Breeding for organic farming** **Product oriented**
  - › Considering of the breeding goals of the organic agriculture
  - › No GMO (no cell fusion)
  - › Selection partly under organic farming conditions
  - › Last multiplication step under organic farming conditions
- › **Organic plant breeding:** **Process oriented**
  - › Breeding specifically /exclusively for organic agriculture
  - › Every selection step under organic conditions
  - › Breeding technics in harmony with the organic farming
  - › Multiplication steps under organic conditions



# Position paper on Organic Plant Breeding from ECO-PB 2012

- **Principles of Organic Plant Breeding (OPB)**
  - **dignity of living organisms**
  - **goals of organic plant breeding**
  - **ethical criteria** – cell integrity, reproductive capacity, scope for extended breeding, respect for crossbreeding boundaries, reproducibility
  - **strategic breeding criteria** - phenotypic selection under ecological cropping conditions, possible extensions eg using molecular markers
  - **socioeconomic criteria** - no patenting, transparency regarding breeding parents and breeding techniques, participatory breeding, as many breeding programmes as possible
- **consequences for choice of cultivars from**
  - (I) **Conventional Breeding programmes**
  - (II) **Breeding for Organic farming (BfO)**



# Definition of Organic Plant Breeding

according to IFOAM Norms 2012

## 4.7 Breeding of organic varieties

### General Principles

- Organic plant breeding and variety development is sustainable, enhances **genetic diversity** and relies on natural **reproductive ability**. Organic breeding is always creative, cooperative and open for science, intuition, and new findings. Organic plant breeding is a holistic approach that respects natural **crossing barriers**. Organic plant breeding is based on fertile plants that can establish a **viable relationship with the living soil**. Organic varieties are obtained by an **organic plant breeding program**.



# Definition of Organic Plant Breeding

according to IFOAM Norms 2012

## Requirements:

4.7.1 To produce organic varieties, plant breeders shall select their varieties **under organic conditions** that comply with the requirements of this standard. All multiplication practices except meristem culture shall be under certified organic management.

4.7.2 Organic plant breeders shall develop organic varieties only on the basis of genetic material that **has not been contaminated by products of genetic engineering**.

4.7.3 Organic plant breeders shall **disclose the applied breeding techniques**. Organic plant breeders shall make the information about the methods, which were used to develop an organic variety, available for the public latest from the beginning of marketing of the seeds.



# Definition of organic plant breeding

according to IFOAM Norms 2012

## Requirements:

4.7.4 The **genome is respected as an impartible entity**.

Technical interventions into the genome of plants are not allowed (e.g. ionizing radiation; transfer of isolated DNA, RNA, or proteins).

4.7.5 The **cell is respected as an impartible entity**. Technical interventions into an isolated cell on an artificial medium are not allowed (e.g. genetic engineering techniques; destruction of cell walls and disintegration of cell nuclei through cytoplasm fusion).

4.7.6 The **natural reproductive ability** of a plant variety is respected and maintained. This excludes techniques that reduce or inhibit the germination capacities (e.g. terminator technologies).

4.7.7 Organic plant breeders may obtain plant variety protection, but organic varieties shall **not be patented**.



# Definition of Breeding for Organic (BfO)

Breeding programs for organic are more product oriented

- have a special focus on the **breeding goals** which are specific for organic agriculture (e.g. tolerance against seed born diseases, weed tolerance, nutrient use efficiency),
- do not use **critical breeding techniques listed in IFOAM Position Paper 2017**
- **Selection occurred at least partially under organic conditions**
- **Cultivar testing and seed production** under organic conditions

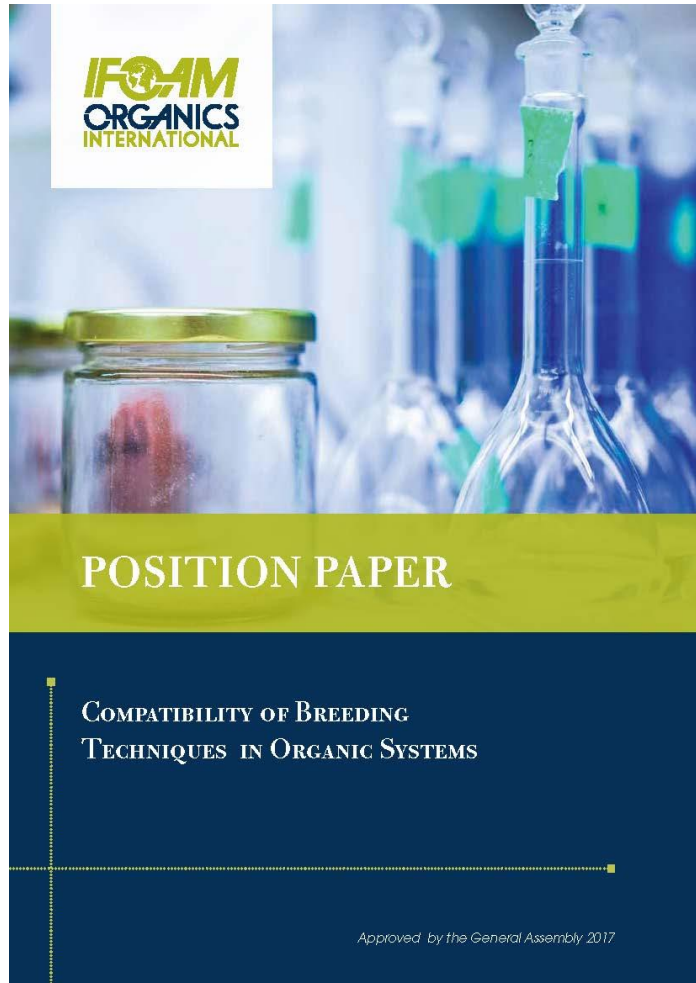


# Position of the Organic Sector on the compliance of New Breeding Techniques (NBT)

- **Position Paper of ECO-PB on Organic Plant Breeding 2013:**
  - Organic plant breeders in Europe will refrain from any breeding technique that technically interferes below the cell level
  - [www.eco-pb.org/fileadmin/ecopb/documents/ecopb\\_PositionPaperOrganicPlantBreeding.pdf](http://www.eco-pb.org/fileadmin/ecopb/documents/ecopb_PositionPaperOrganicPlantBreeding.pdf)
- **IFOAM EU Position Paper on New Plant Breeding Techniques 2015:**
  - NBT are not compatible with organic farming
  - Should be declared as GMO according to EU regulation and labelled accordingly
  - <http://www.ifoam-eu.org/fr/file/position-paper-new-plant-breeding-techniques>
- **IFOAM International: Position Paper on New Breeding Techniques 2017**
  - Draft February 2017, consultation and final approval on General Assembly of IFOAM in November 2017
  - Transparency & traceability to allow freedom of choice for farmers & consumers
  - [https://www.ifoam.bio/sites/default/files/position\\_paper\\_v01\\_web\\_0.pdf](https://www.ifoam.bio/sites/default/files/position_paper_v01_web_0.pdf)

# Compatibility of Breeding Techniques in Organic Systems

## Ifoam International Position Paper approved Nov 2017



Clarity & transparency on the criteria used to determine which breeding techniques are compatible with Organic Farming Systems