

9. How can the values of organic farming be converted into plant worthy breeding?

Organic farming has developed a different way of farming and organic growers can obtain an organic certificate for their products if their farming or processing process complies with the standards and rules of organic farming. The rules for organic farming are an expression of the underlying values of organic farming. What are the values and what do they mean for the way in which breeding as part of the agricultural process can be carried out? We provide a somewhat more philosophical background here.

The basic principles of organic farming

Organic farming presents itself as 'natural' farming based on a holistic approach to nature. Organic farming also opts for a partner attitude to the people/nature relationship rather than a 'ruler' attitude (nature was given to people to farm). A steward attitude that aims to limit the exploitation of nature so that the next generation too can benefit from it does not go far enough for the organic sector. Representatives believe that nature and people depend on each other for their continued existence and are therefore partners, resulting in a partner attitude between mankind and nature.

Concept of naturalness

As the emergence of genetic modification threw up the question 'what is natural and what is not natural?', the Louis Bolk Instituut fleshed out the concept of 'naturalness' in 2002 as this is adopted in organic farming. Three approaches can be distinguished as regards naturalness:

- Adopting the basis of agro-ecology (working with nature, not switching it off)
- So no chemicals (no unnatural substances)
- Respect for the integrity of life (a holistic principle).

These three aspects can be used to derive criteria for assessing whether a breeding technique is or is not 'natural' and whether it is in keeping with the values of the organic sector. Another guide for assessing breeding techniques can be derived from the basic principles of IFOAM.

IFOAM's basic principles

In 2005 IFOAM, as the global umbrella organisation for organic farming, reviewed the central values of organic farming and reformulated them into four principles (www.ifoam.org):

- health (health of earth, plant, animal and people are linked)
- ecology (agro-ecology)
- fairness (in socio-economic context)
- care (precautionary principle)

Shifting bio-ethical operating frameworks

In today's society ethical operating frameworks concerning how to treat the earth are shifting. Whereas in the past it was only human rights that mattered, now the rights of animals and welfare are important; however, the organic sector goes further and attributes an ethical value (intrinsic value) to all living organisms. So nature is assessed not just on the basis of its usefulness for people (extrinsic value) but also on the basis of its ethical relevance (intrinsic value).

- Ethical relevance out of respect for one's own type of living organisms means that their intrinsic nature, wholeness and autonomy are included in the considerations of human actions. This is expressed in respect for the integrity of life.

Consequences for the assessment of breeding techniques

Breeding techniques can be divided according to the level at which they intervene: at plant, cell or DNA level. Biology defines the cell as the lowest level of self-organising life. Based on this definition in-vitro techniques (such as embryo rescue as a type of IVF technique) could be permissible, but laboratory environment with its artificial culture media in petri dishes or test tubes does not fit in with the idea of working together with nature and a living soil. Direct interventions in DNA do not respect the integrity of life, as a plant is reduced to a lump of DNA and then rebuilt from the cell into a plant. This is not in keeping with the values of organic farming.

Summarised in the diagram below:

Table 1. Breeding techniques in three categories and their permissibility (+, ±, -) in organic farming

Techniques at:	Permissibility in organic farming	
Plant or crop level	+	Accepted. See IFOAM standards for breeding. www.ifoam.org
Cell level	±	Not desirable in organically certified breeding programmes such as Bioverita, see Section 10.
DNA level	-	Not permitted. See EU regulations for organic farming. NB: the use of DNA markers in selection is permitted for diagnostic research.