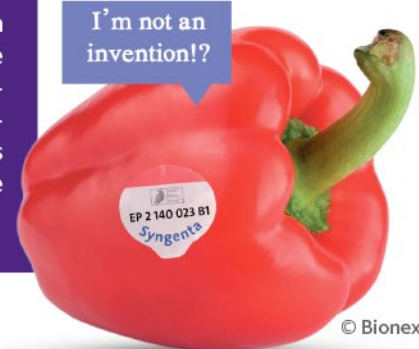




# Fair seed as a basis for organic products

## Eosta takes a stand and supports the breeding of open-pollinated varieties

Seed is the basis of food crops, and thus for products in shops, and comes with a long history. Plant breeding is developing rapidly, a fact that raises questions among growers, shopkeepers and consumers. In 2015, for the first time European patents were granted to companies for plant varieties and native plant traits, such as for a tomato variety with more healthy substances and a bell pepper variety that is resistant to pest insects. These patents have caused strong social indignation: the free exchange of seeds and plant material with these advantageous qualities is blocked by these patents. As a chain party, at Eosta we are taking a stand against this and support the free breeding in line with the values of organic agriculture as well as our products. Eosta pursues fair trade in true sustainable products and also makes out a case for a fair basis: *fair seed*.



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## New opportunities for fair and open-pollinated varieties!

Eosta has therefore initiated the 'Kansen voor zaadvaste rassen' (Opportunities for open-pollinated varieties) in conjunction with the Louis Bolk Institute. In 2015, researchers of the Louis Bolk Institute searched all over the world for potentially interesting open-pollinated varieties, tested a large collection of varieties and even realised some cross-fertilisations. Eosta has created an initial selection of seven varieties that might be suitable for Eosta's range of products. In 2016-2017, these varieties will be further investigated and more consumer-oriented criteria, such as flavour and appearance, will be dealt with. Gert Kögeler, Eosta Marketing Manager, clarifies as follows: 'Over the next years, we will market the first tomatoes and bell peppers based on open-pollinated varieties, thus sending a signal by supporting the breeding of open-pollinated varieties. In 2015, the European Patent Office officially approved that patents on fruit and vegetables are allowed, but the European Parliament declared itself openly and strongly against this. Eosta is also strongly opposed because access to biolog-

ical material and natural products is required for future food security and biodiversity. We are decidedly against the fact that varieties and genetic material may become someone's 'property', risking the control of our food sources to be transferred into the hands of a few multinationals.

Plant qualities that are found in nature and which form the basis of healthy agriculture and nutrition should be freely available for plant breeding. Currently, seed companies have sufficient protection and certainties for innovation and renewal through the plant breeders' rights.

### Fact sheets

Eosta is collaborating with researchers from the Louis Bolk Institute in the open-pollinated varieties for tomatoes and bell peppers project. In this brochure, we provide a more explanation about the dilemmas concerning seed. Extensive fact sheets are available on our website:

[www.eosta.com](http://www.eosta.com)

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where ecology meets economy



## What is plant breeding?

The improvement of agricultural crops dates back to the beginning of agriculture, and started out with the selection of wild grass varieties that produce large amounts of seed, ultimately resulting in grain. Today, plant breeding is no longer based on farmers' knowledge, but instead an important link in our food supply which involves major international players. Plant breeders are constantly searching for the perfect combination of traits by combining a plant with quality A (with high yields, for instance) with that of plant B (high quality). This can be realised by cross-fertilising these two plants. In nature, this takes place through pollen dispersion with the help of bees or wind, whereas plant breeders usually do this manually by collecting pollen from one plant and transferring it to the stigma of another plant (see picture on the right page). Depending on the plant, its size and the number of seeds to be obtained with one single cross-fertilisation, this craftwork may involve more or less delicate work.

## Organic agriculture requires new varieties

Plant breeding is a continuous process that adapts to the developments in agriculture and society, as a result of which new variety traits are required on a continuous basis. This also applies



to organic agriculture. In addition to new pest and diseases, the requirements and preferences of traders and consumers, such as product characteristics (colour, shape and flavour), are subject to change. In addition, the climate is changing, as a result of which varieties are required that can withstand longer periods of drought or rain.

## Open-pollinated varieties

Developing an open-pollinated variety is in fact the most natural way of plant breeding, as it mimics the actions of a bee, bumblebee, fly, or the wind: the pollen is collected from one plant and transferred to the stigma of another plant, followed by selecting the offspring.

The advantage of open-pollinated varieties for growers is the fact that in principle they themselves can multiply these varieties at their own farm, and harvest seeds and resow their own seed. From the biodynamic point of view, the production of farm-saved seed is in keeping with the development of the 'farm individuality'. The fact that a plant is capable of producing a vital next generation ties in with this vision.

The advantage for growers is nevertheless the disadvantage for plant breeders, namely the fact that the seed from an open-pollinated variety can easily be grown again by the grower or a competitor plant breeder.

## The ethics of plant breeding

Improving varieties is a matter of extensive dedication and patience. The development of a new variety averages up to ten years, which is why plant breeding is often focused on new methods to accelerate this process. The recurring question of when there is a case of moving along with nature and when of forcing or even manipulating nature remains: this is a question that is vital for the organic sector.

Organic agriculture stands for respect for the integrity of life. This is why a conscious choice was made to promote living soil by using natural and organic substances only, instead of inorganic substances that are alien to nature, such as artificial fertilisers and chemical pesticides. A more difficult question involves the manner of breeding that respects the plant's integrity as a living entity and thus fits in with organic agriculture. This question starts by making a choice between a more traditional method of plant breeding for open-pollinated varieties and the method of hybrid improvement.



## Hybrid varieties

In order to compensate this loss in income, a plant breeder has the option to work with hybrid seeds. Unlike open-pollinated varieties, hybrid seed can actually be used just once, meaning that the plants from this seed can produce seed, but the seed obtained shows considerable variation, which makes it unsuitable as seed for sowing. The result is that the grower has to buy new seed every year and is no longer able to produce his/her own seed. This protection against replanting is an advantage for the seed producer, but not necessarily for the grower. In addition, hybrid seed is more expensive than seed of open-pollinated varieties because the production of hybrid seed is more complicated and thus more expensive. Naturally, hybrid varieties often have advantages for a grower. In addition to (sometimes) high yields, increased uniformity is also reported as an advantage of hybrid varieties, which is useful if harvesting can take place all at once, and the sorting in crates has to look appealing and even.

There are various opinions about hybrid varieties in organic agriculture.

### Examples of patents on native traits:

- Monsanto's broccoli with an exerted head
- State of Israel's tomato with less water
- Syngenta's bell pepper resistant against white fly
- Syngenta's tomato containing more flavonoids

Source: [www.bionext.nl](http://www.bionext.nl)



The breeding of hybrid varieties is in fact less 'natural', because the parent lines are required to be bred in for various generations before they can be cross-fertilised. As long as these plants can be grown in organic soil and can produce organic seed, the organic sector considers hybrid varieties to be permitted. However, for various reasons the biodynamic sector does not believe that hybrid varieties suit their farming method and is looking to replace them in the long term. The fact that the grower himself is unable to harvest and reuse seed is an important argument.

## An undesired category of hybrids

The 'PPF hybrids' are a new category of hybrid varieties; PPF hybrids which are considered undesirable by both organic and the biodynamic sector. PPF hybrids are a way to realise a higher level of crop uniformity. That is sometimes desired as with 'normal' hybrids, it can sometimes happen - as a result of undesired inbreeding - that anomalous plants appear in the field. However, to make PPF hybrids radical techniques are used such as protoplast fusion (PPF).



## The organic sector is opposed to protoplast fusion for cabbage and chicory

In the case of greenhouse products, such as tomatoes and bell peppers, all of the flowers on the maternal plants are 'emasculated', meaning that the male parts (the stamen) are manually removed using tweezers at an early stage. This way, inbreeding is prevented.

In the case of other (open field) crops, the manual removal of the stamen of thousands of flowers is infeasible, which is why it was decided to find a way to prevent the flowers of the maternal line to create stamen or fertile pollen. These plants are male sterile; a trait which is sometimes found naturally (with carrots and onions, for instance) but not in cabbage and chicory. For the latter crops, this trait had to be included artificially from another not crossable plant species.

The technique that transfers this male sterility in order to become PPF hybrids, is referred to as 'protoplast fusion' and is related to genetic engineering because it directly interferes with the genetic material of a cell. This technique officially comes under the European definition of genetic engineering, but is not required to be treated and labelled as such according to the rules. The organic sector, however, believes that this technique is unnatural to the extent and that it harms the integrity of the plant to such a degree that it is to be considered undesirable.

This means that the organic sector can only use the cabbage and chicory hybrid varieties of which it is certain that they have not come about using these undesired techniques. There still are some 'normal' hybrids, but the choice of suitable varieties for the organic sector is becoming increasingly limited, because there are hardly any good open-pollinated varieties for these crops left.



### Eosta and the Louis Bolk Institute

Eosta is a European market leader in various organic fruits and vegetables and specialises in overseas fruit and Dutch greenhouse products. With its Nature & More transparency system, consumers can learn all about the growers and the stories behind the products. Eosta and the Louis Bolk Institute are jointly working on the 'Chances for open pollinated varieties' project.

The Louis Bolk Institute is an independent and international knowledge institute to advance truly sustainable agriculture, nutrition and health, see [www.louisbolk.nl](http://www.louisbolk.nl). The following persons from the Louis Bolk Institute work on this project: Leen Janmaat, Edwin Nuijten and Edith Lammerts van Bueren.

For more information about this seed project, go to [www.eosta.com](http://www.eosta.com)  
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