



Organic plant-based food

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Of all the organic foods available on the market, plant-based foods are the most well-known and recognised by consumers. Fruits, vegetables, cereals, grains, nuts, mushroom and seaweed, among others, can all fall under the category of organic foods, but they can only be called organic when produced according to rules laid down in the organic regulatory framework.^{1,2}

Propagation

Over the past two decades, organic farmers and producers have developed seeds and vegetative propagation materials (e.g. roots, stems or leaves) to provide a broader choice of plants that can be produced organically. Seeds are considered organic when the parent plants have been grown organically for at least one generation. However, for many species, organic seeds are still not available in sufficient quantities to grow new crops. Therefore, the use of seeds from non-organic parent plants is allowed in some cases, but the new plants must be grown organically.

Soil management and fertilisation

Soil management in organic production requires that natural substances such as manure and other livestock material are used as fertilisers. The fertility and the natural biological activity of the soil is maintained and increased through multiannual crop rotation and co-cultivation - the process of growing green manure crops in rotation with or alongside the main crops. Green manure crops are plants like clover, grasses like rice and rye, as well as legumes that replenish nitrogen in the soil and in turn improve fertility. Crops such as buckwheat are also grown alongside other organic crops because they limit the growth of weeds and reduce soil erosion. The use of mineral nitrogen fertilisers and hydroponic cultivation are prohibited.

Pests, diseases, and weeds

Organic farmers rely on preventive measures in protecting their crops from pests, diseases and weeds, as synthetic pesticides and herbicides are generally not used. Naturally resilient plants are preferred because they respond better to threats such as unfavourable weather conditions. For pest control, natural pest enemies like ladybugs (*Coccinellidae*) and wasps (*Trichogramma*) are used. Farmers use natural pest repellants such as neem (*Azadiracta indica*), garlic, and chilli pepper to ward off pests.³ Mechanical techniques like fruit bagging (covering fruits in bags while still on the tree) and sticky traps for insects are used as well.³ In the events of bad weather or attack by pests, synthetic plant protection products can be used if they have been approved for use in organic production.

Mushrooms, seaweed, and wild plants

Some plant-based foods, for instance from mushrooms and seaweeds, are an important and rich source of [sustainable proteins](#). Mushrooms can be labelled as organic if they are grown using farmyard manure, certain agricultural products or peat and wood that has not been chemically treated. Seaweed can be considered organic if it is collected or farmed in coastal areas that are of high ecological quality and the collection does not affect the long-term stability of the area.

Similarly, wild plants growing naturally in areas such as forests can be also considered organic when the collection area is not treated with any products unsuitable for organic production and when collection does not affect the stability of the natural ecosystem.

Challenges

The main challenge facing the organic food production system is the considerable yield gap, especially when compared to conventional agriculture.⁴ It is estimated that organic crops produce 20-25% less food than their conventional counterparts.^{5,6} To compensate for this, organic products are priced higher, making them less attractive to consumers.

The advantages of organic farming are often overshadowed by the system's requirement for more land to produce less food. This is especially a concern because of the growing population and the fact that several regions around the world are still struggling to achieve food security. Therefore, although it improves environmental and social sustainability, the important question as to whether organic farming could feed the world remains to be answered.⁴

References

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4. Niggli U (2015). Sustainability of organic food production: Challenges and innovations. Proceedings of the Nutrition Society 74(1): 83-88.

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6. De Ponti T, Rijk B & Van Ittersum MK (2012). The crop yield gap between organic and conventional agriculture. *Agricultural Systems* 108: 1-9.