

Controlling Micro Organisms in Organic Farming

Marietta Balotelli*

Department of Food Science and Technology, Roma Tre University, Rome, Italy

Perspective

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***For Correspondence :** Marietta Balotelli, Department of Food Science and Technology, Roma Tre University, Rome, Italy;

Email: balotellimarie@co.it

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INTRODUCTION

Organic farming, also known as ecological farming or biological farming, is an agricultural system that uses organic fertilizers such as compost manure, green manure, and bone meal and emphasises crop rotation and companion planting techniques. It arose in the early twentieth century in response to rapidly changing farming practices. Certified organic agriculture covers 70 million hectares (170 million acres) globally, with Australia accounting for more than half of that total. Various organisations are still working to develop organic farming today. Biological pest control, mixed cropping, and insect predator breeding are encouraged. Organic standards are intended to permit the use of naturally occurring substances while prohibiting or severely restricting the use of synthetic substances. Natural pesticides, such as pyrethrin, are permitted, whereas synthetic fertilizers and pesticides are generally prohibited. Copper sulphate, elemental sulphur, and Ivermectin are examples of synthetic substances that are permitted. It is prohibited to use genetically modified organisms, nanomaterials, human sewage sludge, plant growth regulators, hormones, and antibiotics in livestock husbandry. Sustainability, openness, self-sufficiency, autonomy and independence, health, food security, and food safety are all claimed benefits of organic farming.

DESCRIPTION

Crop diversity

Crop diversity is encouraged in organic farming. Agroecology science has revealed the benefits of polyculture (growing multiple crops in the same space), which is commonly used in organic farming. Planting a diverse range of vegetable crops benefits a broader range of beneficial insects, soil microorganisms, and other factors that contribute to overall farm health. Crop diversity benefits the environment and keeps species from becoming extinct.

Soil management

Organic farming relies more heavily than conventional farming on the natural breakdown of organic matter, using techniques such as green manure and composting to replace nutrients taken from the soil by previous crops. Microorganisms such as mycorrhiza and earthworms drive this biological process, which makes nutrients available to plants throughout the growing season. Crop rotation, cover cropping, reduced tillage, and compost application are some of the methods farmers use to improve soil fertility. Less soil organic matter is lost to the atmosphere by reducing fuel intensive tillage. This has the added benefit of reducing greenhouse gas emissions and assisting in the reversal of climate change. Tillage reduction may also improve soil structure and reduce the likelihood of soil erosion.

Plants require a wide range of nutrients in varying amounts in order to thrive. Organic farmers face a challenge in providing enough nitrogen, particularly synchronisation, so that plants get enough nitrogen when they need it the most. Crop rotation and green manure ("cover crops") aid in nitrogen provision by legumes (specifically, the family Fabaceae), which fix nitrogen from the atmosphere *via* symbiosis with rhizobia bacteria. Intercropping, which is sometimes used to control insects and diseases can also increase soil nutrients, but competition between the legume and the crop can be problematic, necessitating wider spacing between crop rows. Crop residues can be ploughed back into the soil, and different plants leave varying amounts of nitrogen, which could help with synchronisation. Animal manure, certain processed fertilizers such as seed meal, and various mineral powders such as rock phosphate and green sand, a naturally occurring form of potassium, are also used by organic farmers. In some cases, the pH may need to be adjusted. Lime and sulphur are natural pH amendments, but in the United States, some compounds such as iron sulphate, aluminium sulphate, magnesium sulphate, and soluble boron products are permitted in organic farming.

Livestock

Another traditional farming activity that complements growing is raising livestock and poultry for meat, dairy, and eggs. Animals on organic farms are given natural living conditions and feed. Organic certification ensures that livestock are raised in accordance with USDA organic regulations for the duration of their lives. These regulations stipulate that all animal feed must be certified organic.

Organic livestock can and must be treated with medicine when sick, but drugs cannot be used to promote growth. Their feed must also be organic, and they must be pastured.

Horses and cattle were also once a common farm feature, providing labour for hauling and ploughing, fertility through manure recycling, and fuel in the form of food for farmers and other animals. While small growing operations do not often include livestock these days, domesticated animals are an important part of the organic farming equation, especially for true sustainability, or the ability of a farm to function as a self-renewing unit.

Genetic modification

The absence of genetically engineered plants and animals is a key feature of organic farming. The Mar del Plata declaration was issued on October 19, 1998, by participants at IFOAM's 12th scientific conference, where more than 600 delegates from over 60 countries voted unanimously to prohibit the use of genetically modified organisms in organic food production and agriculture.

Although there is strong opposition to the use of any transgenic technologies in organic farming, agricultural researchers Luis Herrera-Estrella and Ariel Alvarez-Morales continue to advocate for the incorporation of transgenic technologies into organic farming as the best way to achieve sustainable agriculture, particularly in the developing world. Many agricultural applications of biotechnology, according to organic farmer Raoul Adamchak and geneticist Pamela Ronald, are consistent with organic principles and have significantly advanced sustainable agriculture.

CONCLUSION

Although Genetically Modified Organisms (GMOs) are prohibited in organic farming, there is concern that pollen from genetically modified crops is increasingly penetrating organic and heirloom seed stocks, making it difficult, if not impossible, to keep these genomes out of the organic food supply. As described in the article on the regulation of the release of genetically modified organisms, different regulations between countries limit the availability of GMOs to certain countries.