

"Organic production is typically an invention of the rich in Western Europe. They are now projecting their loss in nature and biodiversity onto developing countries." This is what somebody from Africa said to me during the European Conference on Organic Production held in Copenhagen, May 2001. Another said that organic production as a notion has too many definitions. "It is too complicated for poor people to quickly understand." Intriguing was also the remark of a producer of synthetic pesticides: "organic production is nothing other than something from the Middle Ages". "How could they plead for a methodology which produces nothing else than hunger and soil exhaustion? It is even worse, they advocate organic production as the alternative for future agriculture" (Trewavar, 2001).

Eric Goewie



A green fence against insects in a small city garden

Organic Production What is it?

Those are the judgements about organic production among representatives from developing countries, industries and advocates of intensive agriculture. Fortunately, scientists and policy-makers encounter evidence that organic production does

shall discuss the notions "intensive", "efficient", "integrated", "organic", "precision", "high-tech", "biological", "sustainable", "ecological", "agroecological" and "biodynamic" production. All of these terms are used arbitrarily. Thirdly, I shall demonstrate strong and weak aspects of organic production, focusing especially on urban agriculture. Finally, I shall address the question of whether organic production is always and under all circumstances an alternative for mainstream production.

However, Europe and the US have a different starting point for their agricultural policy. For them, agriculture is an economic activity that should be developed with capital and technology for the benefit of the investors involved. Handsmeyer (1979) and Van der Werff (1993) show the difference between these two viewpoints in two models. Figure 1 shows a model for organic production while Figure 2 shows one for mainstream production.

The most important difference is the use of natural cycles

make sense. Pretty (1999) shows that organic production provides sufficient and healthy food in developing countries.

Developments in Cuba show that organic production raised more advantages than was accepted before. Evidence from Western Europe demonstrates that organic production is profitable indeed. However, it is still problematic to understand exactly what falls under the notion "organic production". One thing is clear: organic production has strong potential for drawing consumer response.

This article explains the discrepancy between judgement and reality concerning organic production. I shall do this along three points of view. Firstly, I will clarify what organic production actually is. I shall do that by demonstrating two scientific models. Secondly, I

WHAT IS ORGANIC PRODUCTION?

Organic production concerns the management of agroecosystems with the aim of getting a sufficient and sustainable provision of agroeconomic commodities for the national market. This management is based on respect and responsibility for, and knowledge of the biosphere. Production as such should be supported by governmental legislation and by independent research and education (Vereijken 1992). Basic to this concept is that agriculture is a societal good. Other societal goods are, for example, peace, safety and public health. In other words, people everywhere in the world have a basic right to sufficient and inexpensive food of good quality.

The most important difference between the two figures is the use of natural cycles. Organic production is most consistent in creating natural feedback mechanisms. For instance, plant nutrients taken from the farm by harvests are replenished by nutrients from nature. Nitrogen can be captured from the atmosphere via nitrogen-fixing micro-organisms, via animal manure or compost. Phosphates originate from natural rock. Recent research demonstrated that careful soil management stimulates the development of mycorrhizae, beneficial soil fungi important for providing water-soluble phosphates, which are important for plant root development (Dekkers et al. 2001). In this way, soils are not considered as just a substrate from which plant

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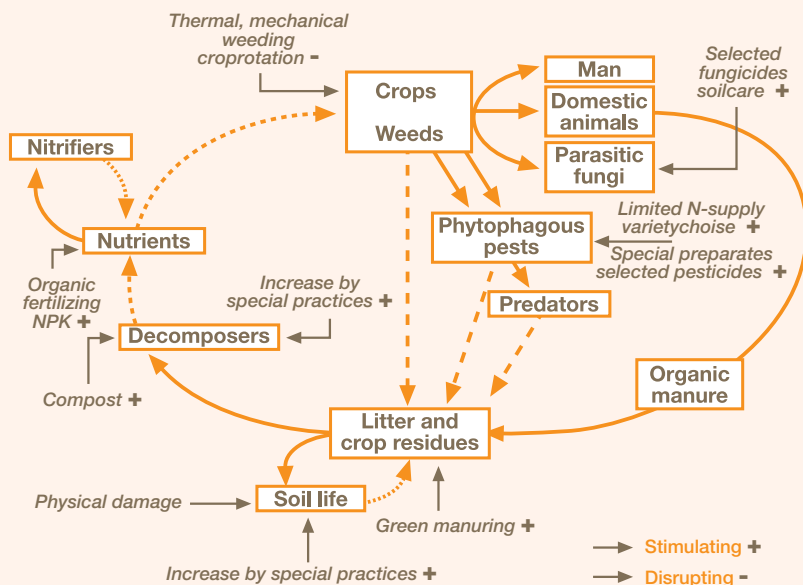


Figure 1 Agro-ecosystem ecological

Model of an organic food production system supported by self-organising (buffered) natural resources that are present at the production site. Each arrow hides a great deal of knowledge built by on-farm research and experience. The system is dependent on natural resources and fully dependent on farmers' decision-making skills. Note that items are linked. They form one dynamic cycle. Arrows indicated by a "+" refer to production methods that support the cycle. Arrows with a "-" disrupt the cycle.

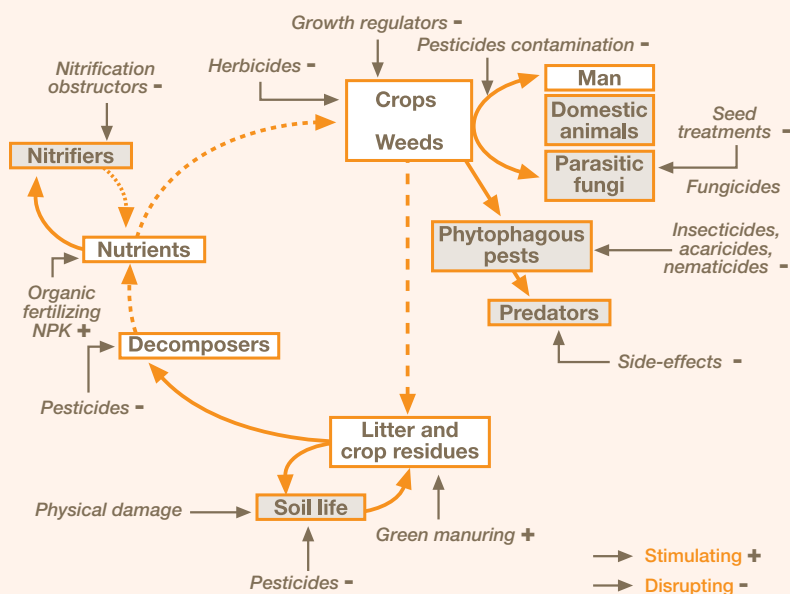


Figure 2 Agro-ecosystem conventional

Model of a conventional food production system, supported by high costs, synthetic chemicals, irrigation systems and energy. Each arrow hides a large number of scientists, institutes and public regulations (laws) at the cost of the taxpayer. The system is independent of natural resources and fully dependent on suppliers. Note that there are no cycles anymore. Arrows indicated by a "-" refer to the fact that the production method involved has been designed in order to "prevent" cycle formation. According to Odum (1971) such a system is like a pioneer ecosystem. Pioneer ecosystems typically produce high amounts of biomass per hectare and allow for low biodiversity.

roots obtain their nutrients, but as a living and self-organising ecosystem. Such a system bears beneficial organisms in the soil that contribute to a buffered system of soil fertility.

Natural cycles are prevented from developing in mainstream farms. Such farms have as their aim the production of as many kilograms per hectare as possible. Synthetic and artificial chemicals substitute natural resources.

Organic farms are self-organising systems. They are very much bound to natural resources and surroundings. They produce sufficiently, while maintaining a high level of agricultural biodiversity. Mainstream farms are disconnected from their natural surroundings. The physiology of crop plants and domestic animals are manipulated in such a way that they produce the highest numbers of kilograms per hectare. The latter system implies monocropping which ensures a quick return on investment. The management of such a production system focuses on the continuous improvement of input efficiency. That is to say that the manager must try to get as much as possible from one kilogram (e.g.) of chemical fertiliser. So, suppliers are expected to have strong influence on the development of mainstream agriculture.

There is another important difference between both production systems. Mainstream production demands a strong and reliable government. The government, which safeguards the general public interests, must play a much larger role in mainstream than in organic production, in which the farmer plays the largest role. Why is this? Intensive, mainstream agriculture, very much controlled by investors' interests, could be tempted to use more chemicals than are strictly necessary. The old assumption of "if it does not do any good, it does not do any harm" has already caused harm to society. All of the environmental pollution, soil and nature degradation as well as residues in food that we find today are strongly related to this attitude. Moreover, European research has established that only 30 to 40 % of chemical fertilisers applied are used for production, while the rest is lost. For pesticides this is even worse: only a small percentage of spraying contributes to pest pre-

vention or the killing of harmful organisms. Pimentel (1991) found that more than 95 % of each spraying went into the environment without reaching the target. Research in The Netherlands has shown that very precise management reduces such losses tremendously, without any loss of production (Aarts 2000). This research made clear that not only hard data should be of interest to researchers. Soft information such as input-output relations and processes is very important as well. Organic producers are very skilled in using this kind of information. They observe more, and know how to register and interpret observations correctly. In organic production, farmers are at the centre of their farm and become skilled managers of their farm-bound natural resources, step by step.

DESCRIPTION OF VARIOUS NOTIONS FOR ORGANIC PRODUCTION

Production systems that differ from mainstream (intensive) production have been stigmatised for being "alternative". "Green" production systems have thus developed a political context, and green agriculture is stuck with a load for which it never asked. Researchers, farmers and

consumers have therefore come up with terms in order to destigmatise their thinking about "greener" agriculture. Table 1 clarifies the differences between various green production notions. These differences are explained from the point of view of farmers' objectives and the farm spaces involved. Synonyms are sometimes necessary for special reasons relevant to specific countries, regions or cities. The various notions of organic production depend on the criteria involved. European legislation on "organic production" has been based on basic and mea-

surable criteria. Latin America also includes societal criteria such as equity, social justice or fair trade, and therefore uses the wider term, "agroecology", instead of organic.

STRONG AND WEAK ASPECTS OF ORGANIC PRODUCTION FOR URBAN AGRICULTURE

Organic production is generally considered to be a realistic answer to society's demand for sustainable production. Many governments therefore consider organic production to be a tool for regional development as well (Anonymous 1996). But some weaknesses are involved as well. World development, for instance, focuses more and more on globalisation and world trade. So, life in the countryside becomes less, and urban life more, important. Is organic thinking a match for this? Moreover, the success of organic production seems to be slowing down (Goewie 2002). So, will organic agriculture remain a reliable tool in the near future?

Figure 3 provides a schematic representation of the trend of organic production. We see that it developed to a certain level and has now become dependent on powerful market demands.

The question is which factors will make an impact on the further development of organic production. For urban and peri-urban areas, I expect that only market demand will be the determinant factor. This will increase the more the consumers become convinced that organic agriculture has an added value for which they want to pay. Therefore, the development of organic urban agriculture must also pay attention to the development of reli-

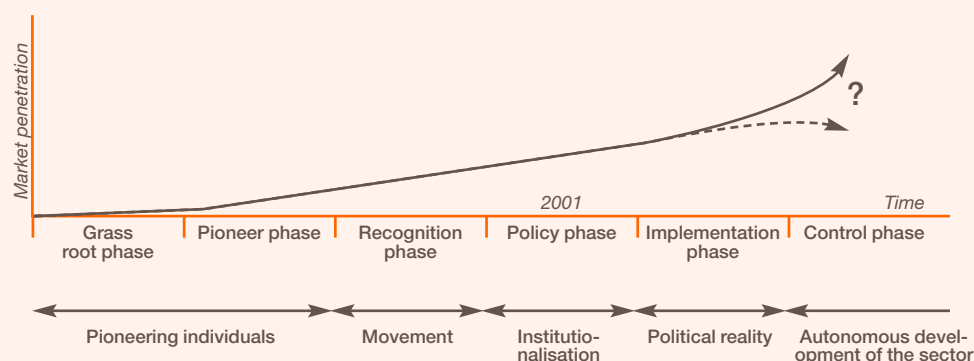


Figure 3

The history of organic production expressed as a function of market penetration over time. The solid curve represents the partly realised and expected development. The dotted curve extrapolates what also could happen. The question mark indicates where knowledge may support further growth of organic production.

Table 1 Overview of various concepts used regarding greener agricultural practices

Form of agriculture	Synonym	Target of each form of agriculture	Area of use
Mainstream	<ul style="list-style-type: none"> ❖ Mainstream agriculture ❖ Intensive production ❖ Industrial production ❖ Conventional agriculture 	<ul style="list-style-type: none"> ❖ National income 	Knowledge and advice from science and extension focus only on the primary production site
Efficient	<ul style="list-style-type: none"> ❖ Integrated agriculture ❖ Precision production ❖ High-tech production ❖ Sustainable production 	<ul style="list-style-type: none"> ❖ National income 	Knowledge and advice from science and extension focus on the farm as a whole and on its surroundings
Biological	<ul style="list-style-type: none"> ❖ Organic agriculture ❖ Ecological production ❖ Agroecological production ❖ Sustainable production (again) 	<ul style="list-style-type: none"> ❖ Farm profitability ❖ Self-organising ecosystems at and around the farm 	Knowledge and advice from science and extension focus on the farm as a whole and on its surroundings
Biodynamic	<ul style="list-style-type: none"> ❖ Biodynamic agriculture 	<ul style="list-style-type: none"> ❖ Farm profitability ❖ Self-organising ecosystems at and around the farm ❖ Social and value aspects 	<p>Knowledge and advice from science and extension are extended according to certain values and farmers' experiences. They concern the effects of agricultural production as part of world systems now and in the future</p>

able certification and inspection systems. If not, then “organic” will lose its added value soon.

My experience with organic production worldwide is that it is most auspicious in regions where local stakeholders (e.g., regional government, farmers, consumers, nature and environmental protection organisations and research institutes) cooperate closely together. Vereijken (1992), Kabourakis (1996) and Auerbach (1999) showed that especially smallholders (family farms) together could create very efficient forms of organic production. The profitability involved has improved because of fewer costs for external inputs. Another important gain was that producers became efficient managers of their surroundings (water, air, garbage, wastes, biodiversity). They also improved the quality of their life. Smeding (2001) showed that more organic production in and around a city improves biodiversity.

Mutual learning within regional decision platforms of producers and consumers has the effect that people start to rely on their own experiences, thus becoming less dependent on those who always promise the world (Röling 1994). Moreover, platform cooperation enhances awareness concerning the use of synthetic chemicals.

Despite all of these positive aspects of organic production, we also need to take a look at the disadvantages involved. There

is evidence which indicates that this type of production system imposes yet another burden on women in developing countries (Howard-Borjas, pers. comment). This is so because organic farming has higher demands on labour for weeding, plant protection and harvesting, etc. As herbicides are not permitted within organic farming, weeds must be removed by hand. Plant protection without chemicals also demands more time for inspection. Harvesting can consume more labour as well due to the wider range of crop species, each growing and ripening at different moments of the year. As women traditionally take up a great deal of the farm activities in developing countries, Borjas expects that more labour will

Good presentation is important



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Besides these disadvantages, are there sufficient opportunities for introducing organic production methods? And what about the threats involved? Table 2 presents an overview of the most important strengths and weaknesses of organic urban agriculture, as well as the opportunities and threats presently involved. The table also suggests what types of cooperation stakeholders should strive for in order to make urban organic production a realistic option.

CONCLUSION

Organic production is a strong concept for application by mainly small-sized family farms in and around cities, because of excellent opportunities for direct selling. Of much more importance is that consumers are in the position to see how their food is produced. This factor may address their growing concern about food quality and safety. Cooperation among acknowledged farmers on the one hand and between farmers and consumers on the other is a prerequisite. It is also important that the cooperation establishes a convincing certification and inspection system that approves the added value of organic products.

Table 2 SWOT analysis about urban organic production, based on experiences from all continents

Strengths	Weaknesses	Opportunities	Threats
❖ local food supply	❖ labour burden (on women) in farm management	❖ privatisation	❖ political undesirability
❖ local employment	❖ vulnerability to intensification	❖ governmental support	❖ loss of added value while up-scaling
❖ marketing	❖ impact of dangerous substances from traffic and waste	❖ good image in society	❖ (unfavourable) legislation
❖ green surroundings	❖ investments needed	❖ cooperation in research and extension	❖ emergence of gene technology
❖ social cohesion	❖ knowledge intensiveness	❖ cooperation with NGOs	❖ diseases and pests
❖ learning processes		❖ ease of platform-building	❖ commodities thinking rather focus on production processes
❖ autonomy			
❖ beauty and safety			
❖ empowerment of people			