Int. J. Agricult. Stat. Sci. Vol. 15, No. 1, pp. 111-113, 2019 *ISSN : 0973-1903*

ORIGINAL ARTICLE

ORGANIC AGRICULTURE BETWEEN THE PROSPECTS AND FUTURE CHALLENGES - A REVIEW

Ridha Mustafa AL-Obaidy

Department of Horticulture, College of Agricultural Engineering Sciences, University of Baghdad, Iraq.
E-mail: plantbreeding666@yahoo.com

Abstract : The influences of green revolution have assisted the farmers to conversion from inorganic to organic farming, but there are problems to conversion and follow this system of agriculture. Therefore, this review attempts to study recent developments in organic farming and its future challenges. This paper has referred to organic farming model in global and arabic regions .The main subjects included some solutions of organic system challenges such as yield reduction in conversion to organic, soil fertility enhancement and environment. Also this review pointed to the some problems that impede the expansion of organic agriculture in Arab countries.

Key words : Organic farming, Sustainable farming, Animal manures, Nitrogen fixation.

1. Introduction

Organic agriculture is a holistic system for managing production that promotes and enhances the health of agro-ecosystems, including biodiversity, biological cycles and soil biology. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account the need for local systems in regional conditions. This is achieved by using agronomic, biological and mechanical methods instead of synthetic materials to fulfill any specific function within the system, where possible [FAO (1999)]. More of organic agricultural practices were the only choice for farmers before fertilizers, biocides, medicines, mechanization and fossil fuels that allow industrial agriculture to function. Farmers had no option but to work in biological and ecological systems without the use of these technologies. For example, human and animal manure and leguminous plants were the only source of fertilizer to replace nutrients from cultivated fields. The failure to rotate crops led to an increase in pests, as no pesticides were used to control them. From this perspective, organic agriculture is the original and mainstream agriculture that departs from the practices that agriculture has followed since its inception. Organic farming is increasing worldwide and today 141 countries are providing fresh fruit and vegetables commercially. As estimated in 2007, organic food is produced worldwide in approximately 32,2 million hectares (Mha) managed by more than 1,2 million suppliers, along with small farmers. There is 0.4 M ha of certified organic aquaculture in addition to the agricultural land. Some 65 % of the countries who followed organic agriculture are developing countries. Austria has the highest percentage of land under organic farming (8.40%), followed by Switzerland, the United Kingdom and Germany [SOEL Survey (2004)]. Ganem (2015) referred to that in the Arabic region Egypt was the first country entered organic agriculture system in 1977 when founded the SEKEM farm for biological agriculture ,there are still many Arab countries that have not entered organic agriculture except through individual efforts and in limited areas, such as the Sultanate of Oman, where 40 hectares, Iraq, where 39 hectares, and in Qatar and Kuwait numbers negligible.

The land when transfer from inorganic agriculture to organic agriculture, will be less food available due to production losses during the conversion period. These organic foods go to the rich, who can buy them. As a

Received *December 24, 2018* ***Revised*** *April 19, 2019* ***Accepted*** *May 04, 2019*

result, food available to the poor is decreasing. However, organic farming is productive and sustainable [Letourneau and Goldstein (2001), Mader *et al*. (2002)]. The same problems impede the expansion of organic agriculture in all Arab countries and the lack of attention to national legislation and laws regulating organic agriculture, with limited government support. The limited financial potential of farmers, the high cost of transferring to organic agriculture and the costs of registering and approving farms and companies are a major factor in their non-proliferation. In addition to rising production costs in general and above all, political instability and wars in the Arab region over the past ten years have led to a significant reduction in the development of organic agriculture.

Classical models for developing organic system

The classical path in the development of organic agriculture in the Arab region includes the expansion of organic areas, whether by reclamation of new land areas and organic cultivation and registration as organic land. This solution may be suitable for some countries that have land suitable for reclamation such as Egypt, whose government has announced the reclamation of one million acres under an ambitious plan. For the rehabilitation of 4 million acres in the coming years. On the other hand, some other countries, such as Sudan and Morocco have large tracts of wild and natural land without the use of any chemicals, known as municipal or natural crops. These areas can be registered as organic lands and benefit from the sale of their products as organic products in international markets and local [Ganem (2015)].

Yield from inorganic to Organic farming

Farmers largely convert to organic farming because of the uneasiness experienced with the existing agriculture system, which is predominantly based on chemicals. Some farmers perceive chemical agriculture to be health hazard for themselves. However, personal health is not the only reason to convert to organic farming. Yields can decrease during the conversion period from conventional to organic farming, as crop yields are boosted by artificial fertilizers and soil fertility takes time to increase. However, after conversion, yields will be equal, if not higher than the yield during the conventional farming. Though comparative yield studies are only a few at global levels, certain studies have provided a broad indication about the comparative yield of organic farms against conventional farms. For crops like rice, organic farming seems less costly and effective than other crops. However, under the long-term organic system, there is more scope to reduce the costs and environmental damages [Rajendran (2002)]. The equilibrium of the environment is important so that crops, trees, animals and humans can live more healthy. The detraction in the use of pesticides can bring direct economic benefits to growers by reducing input costs and thus increasing net returns [Brenner (1991)]. Cacek (1984) reported that the diversity of crops in organic farms can have other economic benefits, as diversity offers some protection against adverse price changes in a single product. Most organic farmers have reported that it was not the premium price of organic products that motivated them towards organic farming, but reduced expenditure on inputs and similar yields to their neighboring conventional farmers [Sharma (2005)].

Soil Fertility and Ecology

The technologies of the green revolution created the perception that soil fertility is produced in chemical factories and that agricultural yields are measured only by marketed goods. We have forgotten how to feed the soil in our modern agricultural system; we feed plants only. If we feed the soil, only the elements which were exported with the products must be compensated. To some extent, this need can be fulfilled by growing plants such as soybean and cowpea which fix nitrogen [Muhammed (2016)]. In this way, an organic system with extremely low fertilizer inputs in the ground can be developed [Alvares *et al*. (1999)]. Butterworth *et al.* (2003) studied the soil fertility management practices of farms, they found that farmers are generally rational decision makers, who weigh the costs of any practice against the potential benefits and try to make a net profit. What was unproductive and waste in the commercial context of the green revolution is now emerging as ecologically productive and the only way to sustainable agriculture [Abed AL-Hussain and Muhammed (2016), AL-Amry and Mohammed (2017), Shiva (1992)]. The solution to the crisis of dying soils can not lie with those who created the problem and looked only at the market, not at the soil's life. The cure and recovery of soil health will not emerge as the organizing principle for agriculture continues to cling to the market. This recovery is the rediscovery of natural ways of learning and renovation to see that the soil has a right to maintain its health. Respecting that right is critical to satisfy our needs

[Alvares *et al*. (1999)]. However, the new biochemical technology in agriculture has a lot of negative environmental impacts. Since the 1960s, the use of chemical products such as fertilizers and pesticides has increased significantly. There is sufficient cause for concern about these chemicals 'environmental consequences'. In the 1980s, in particular, it was realized that alternative farming practices are needed for sustainable development [Mahendra Dev and Painuly (1994)]. The continuous use of pesticides has resulted in diseases such as cancer and epilepsy, with which people have suffered for years. Alternatives to pesticides can be found in the long term and a concerted effort must therefore be made by all concerned to promote sustainable agricultural development within the broader environment and health framework [Rajendran (2002)]. The economic and environmental impact of our agricultural policies on the reduction of pesticides also requires scrutiny and policies that encourage the adoption of environmentally sound farming practices [Brenner (1991)].

Acknowledgement

The first author is thankful to the anonymous referee for his valuable comments for improvement on the earlier draft of this paper.

References

AL-Amry, N. J. and M. M. Mohammed (2017) . Influence of adding ascorbic acid and yeast on growth and yield and Rhizobium of snap bean (*Phaseolus vulgaris* L.) under irrigation with saline water. *IOSR Journal of Agriculture and Veterinary Science*, **10(10)**, 23–28.

Abed AL-Hussain, R. M. and M. M. Muhammed (2016). Influence of whey foliar spraying and growing point pinching on growth and yield parameters of okra. *The Iraqi Journal of Agricultural Sciences*, **47(4)**, 973-979.

Alvares, C., V. Shiva, S. Ismail, K. V. Lakshmi, K. Mathen and D. Bernard (1999) (eds). *The Organic Farming Reader*, Other India Press, Goa, pp. 84;171.

Brenner, Loretta (1991). Dollars and Sense: The Economic Benefits of Reducing Pesticide Use. *Journal of Pesticide Reform*, **11(2)**, 18-20.

Butterworth, J., B. Adolph and B. Suresh Reddy (2003). *How Farmers Manage Soil Fertility. A Guide to Support Innovation and Livelihoods*. Andhra Pradesh Rural Livelihoods Programme, Hyderabad /Chattam: Natural Resources Institute, UK.

Cacek, Terry (1984). Organic farming: The other conservation farming system. *Journal of Soil and Water Conservation*, **39**, 357-360.

FAO (1999). *Organic Agriculture*, Food and Agriculture Organization of the United Nations, Rome.

Ganem, Khaled (2015). New horizons for organic agriculture in the Arab region. SciDev.Net Regional Office for the Middle East and North Africa Region. https://www.scidev.net/mena/agriculture/opinion/New-horizons-organic-agriculture-Arab-region.html

Letourneau, D. K. and B. Goldstein (2001). Pest damage and arthropod community structure in organic vs conventional tomato production in California. *Journal of Applied Ecology*, **38(3)**, 557-570.

Mader, P., A. Fliefback, D. Dubois, L. Gunst, P. Fried and U. Niggili (2002). Soil fertility and biodiversity in organic farming. *Science*, **296(5573)**, 1694-1697.

Mahendra, Dev, S. and J. P. Painuly (1994). Fertiliser and pesticide use in agriculture : Environmental issues. In: *Proceedings of the National Consultation on Environmental Issues in Agricultural and Rural Credit*. Indira Gandhi Institute of Development Research, Bombay, 15-16 April.

Muhammed, M. M. (2016). Estimation of genetic parameters in cowpea. *AL-Anbar Journal of Agricultural Sciences*, **14(2)**, 226-236.

Rajendran, S. (2002). Environment and economic dimensions of organic rice cultivation in South India, Paper presented at the *International Conference on Asian Organic Agriculture*, Suwan, Korea. 12-15 November.

SOEL-Survey (2004). *Foundation Ecology and Agriculture*, Germany.

Sharma, S. (2005). Contour cultivation based natural farming technique. *Organic Farming Newsletter*, **1(2)**, 3-6.

Shiva, V. (1992). *The Voilence of Green Revolution*, Other India Press, Goa.