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Organic Agriculture: The Alternative for Sustainable Food Production in Nigeria

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Abstract

In the face of dwindling food supply and high cost of foodstuff occasioned by high cost of inputs particularly chemical fertilizers, a case was made in this paper for organic agriculture as an alternative for sustainable and affordable food production in Nigeria. In this task, the high cost of chemical fertilizers and the other drawbacks associated with its use were highlighted. The concept of organic agriculture was defined and the materials and farming systems associated with its adoption were also highlighted. The prospects of the agricultural system were identified within the framework of national realities. It was concluded that though the concept of organic agriculture discourages the use of fertilizers and other farm chemicals, what is more practicable is a system that combines organic farming with the elements of chemicals that can still be tolerated with minimum economic and environmental consequences.

In Nigeria, there is a steady population growth and increasing food demand. This implies that there is increasing pressure on the available arable land (Ahn 2000). This also implies that a piece of land has to be cultivated year in year out to meet population demands. The fertility of the land that is cultivated every year has to be maintained though alternative sources like the application of chemical fertilizers, otherwise the soil will not be productive (Bear 2001).

A chemical fertilizer as defined by Brady (2006), is an inorganic manure added to the soil to improve its fertility and more importantly, its productivity. Nitrogenous, phosphatic and potassic materials are used as single or compound fertilizers to sustain agricultural production with limited land resources.

However, chemical fertilizers have been found to have some drawback (Eden, 2008). These pitfalls include high cost of chemical fertilizers. A good number of the local farmers cannot afford the cost of fertilizers. This abnormal cost could be attributed to inefficient distribution mechanism created by the middle men and politicians.

On the other hand, continuous use of nitrogenous fertilizers leads to soil acidity and renders the land unproductive for most crops. Soil fertility derived from fertilizer application does not go beyond one cultivation. Continuous use of rock phosphate fertilizers in leguminous crops production leaves an undesirable solid residue thereby reducing the economic value of the land. Routine fertilizer applications cause water and air pollution when due ecological considerations are not made. The chemical could also be harmful to both the crops and the farmer when strict precautionary measures are not observed.

All these tend to suggest that reliance on chemical fertilizers in modern day agriculture is dangerous and no longer feasible. A case is therefore made in this paper for the adoption of organic agriculture as an alternative for sustainable food production for the country. Sustainable food production is of course, defined within the context to mean the desirable level of food production that can be attained and maintained without jeopardizing the future of younger generations (Akpakpan, 2010).

Concept of Organic Agriculture

Organic agriculture can be described as a corrective measure to all the drawbacks associated with the use of chemical fertilizers. It also discourages soil erosion and water run-off by forming a protective cover on the soil surface. It can be defined as all the farming systems and practices that involve the use of organic fertilizers or manures as an alternative to the use of manufactured chemical products as fertilizer (Faniran and Areola, 2010). The concept of organic agriculture is synonymous with organic farming with emphasis on the use of natural plant and animal materials as sources of plant nutrients that endure in the soil from season to season-(Foth, 2010).

The organic materials that could be utilized in organic agriculture include: Pelleted or granulated organic fertilizers, organic dust eg saw dust, organic ash - plant and animal ash, crushed bone, blood, and other fluid mixtures, organic insect and weed killers and organic antibacterial eg wild herb that are available in supermarkets,

agrochemicals shops, university farms and agricultural research institutes in Nigeria and other developing countries. Others include compost – decomposed materials, green manure- freshly cut materials and farm yard manure (FYM) that include animal droppings and crop residue that can be prepared by the farmer or sourced locally. The farming systems involved include crop rotation, alley farming, vegetative fallowing, taungya system, mixed farming and zero tillage system. Some of these organic materials and farming systems are essentially utilized in the control of pests and diseases rather than dependence on insecticides, pesticides, herbicides and other chemicals that are not only dangerous and expensive but pose serious ecological problems.

Farming Systems in Organic Agriculture

Crop Rotation

Crop rotation can be defined as a system of growing different crops in recurrent succession on the same land (Olaitan, Lombin and Onazi 1990). A good rotation that provides for maintenance or improvement of soil productivity usually includes a legume crop to promote fixation of nitrogen, a grass or legume sod crop for maintenance of humus and a cultivated or infertile crop for weed control.

In addition to maintaining the fertility of the soil, crop rotation optimizes land use and helps to control pests and disease. The control of pests and diseases is achieved by breaking their chains in the ecosystem through the alternation of crop production with periods of vegetative fallow. Pests and disease organisms are eliminated with the alternate removal of the host organisms in the crop cycle.

Alley Farming

Alley is a combination of crop cultivation with fallow hedges, shrubs, and other woody species spared during-bush clearing and seed-bed preparation for the purpose of soil and water conservation, for improved fertility and productivity. It improves the organic matter status of the soil for sustainable crop production since it addresses the increasing ecological stress imposed by population pressure and a rapid deteriorating natural resource base. (Audu, Abakura and Daniel 2009).

Vegetative Fallowing

This is the practice of allowing a land to rest for a while to naturally regain its fertility. The natural vegetative growth may be supplemented by planting some species with desirable qualities (Webstar and Wilson 2010).

Just like crop rotation, vegetative fallowing or bush fallowing also helps to control pests and diseases through the systematic removal of the host organisms that is achieved when the plot of land is left temporarily uncultivated.

Mixed Farming

Mixed farming is the integration of animal production and crop cultivation in the farm. Integration of crop and animal enterprises increases the total productivity of small holder resources and improves welfare. It is important in ensuring sustained productivity and stability in most ecosystems. (Beets,1990).

Zero Tillage System

In the fadama areas with rich alluvial soil that is prone to erosion and leaching, planting holes are made and seeds planted without tillage. The essence is to conserve the soil and ensure continuous cultivation with no farm chemicals and no pollution of adjacent water.

Taungya System

Taungya System can be defined as the practice of combining early stages of forest establishment with food crop production. It optimizes land use and helps to control pests and diseases (Akinyosoye 1990). Organic agriculture encourages efficient utilization of natural resources for the production of crops and livestock (Black 2004). When rural communities revert to organic farming, the politicization of fertilizer procurement and distribution will be minimized, the damage done to the environment through agricultural activities will be reduced and health problems arising from use of chemical contaminated products will be eliminated. Some of the prospects of organic agriculture in the country can now be considered.

Prospects of Organic Agriculture

Full dependence on organic sources of manure and animal feed for food production is very feasible. Its prospects are provided by the following realities in Nigeria:

- i) The plant and animal materials that could be used as organic manure and animal feeds are very abundant and readily available.
- ii) The procurement of organic materials is cheap, if not free.
- iii) The preparation of these materials is not elaborate or sophisticated.
- iv) There is no much danger in their application or use and so little precautionary measures are observed.
- v) The use of these materials is environment friendly as no pollution or environmental hazard may be caused.
- vi) Materials used encourage soil and water conservation which is the basis of food production.
- vii) Plant nutrients generated are judiciously utilized and continues in the soil from season to season while resisting leaching accompanying tropical rains.
- viii) Above all, organic materials have very high comparative advantage over chemical materials in all aspects of food production.

Conclusion

An attempt has been made to discuss the concept of organic agriculture as the alternative for sustainable and affordable food production in Nigeria. The various materials and systems associated with its adoption have been highlighted. Also highlighted were its prospects within the national framework. It could be concluded that though the concept of organic agriculture discourages the use of fertilizers and other farm chemicals, what is more practicable is a system that combines organic farming with elements of chemicals that can still be tolerated with minimum economic and environmental consequences.

Recommendations

On the basis of the discussions and the salient issues raised, the following recommendations were made:

- i) Organic farming should be combined with the elements of chemicals that can still be managed.
- ii) The fault in the distribution system of these manageable chemicals created by the middle men and politicians should be rectified to make their prices affordable to Nigerian farmers.
- iii) The national agricultural extension system should be organized and mobilized to educate the local farmers on the materials and systems associated with practicable organic farming.
- iv) The general public should be enlightened while farmers should be sensitized on the inherent dangers associated with total dependence on chemicals for food production.
- v) Demonstration organic farms should be established by the Agricultural Extension units of both the federal and state ministries of agriculture to practically demonstrate the benefits of organic agriculture over sole dependence on chemicals for fertilization, pests and diseases control.
- vi) The local farmers should be encouraged to form cooperative societies so that the basic farm inputs can be distributed directly to the users.

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