

Relevance of Empty Fruit Bunch and Palm Bunch Ash in Organic Agricultural Production in Nigeria

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Abstract: This paper reviewed the relevance of empty fruit bunch and palm bunch ash in organic agricultural production with particular focus in sub-Saharan Africa. In doing this, books, journals, interactions with farmers and observations and internet were used in the production of this paper. In most sub-Saharan Africa countries, there is serious environmental degradation as a result of the dependence of the farmers on agro-chemical inputs for crop production. The farmers believe chemical inputs give higher yield with less energy dispensation in the application of the chemicals unlike the organic inputs such as manure which is bulky and requires labour and ensuing cost. The farmers' attitude through improper use of agrochemicals or excessive use of high external inputs causes damage and poses danger to the farmer, his crops, livestock and his environment. The use of empty fruit bunch as mulch and organic manure; and palm bunch ash as organic fertilizer in crop production with particular reference to root and tuber crops since palm bunch ash has been established to be rich in potassium oxide, will serve a great purpose in reducing farmers' dependency on agrochemicals and redirecting their steps toward organic agricultural production.

[Okoli, Nneka Angela. **Relevance of Empty Fruit Bunch and Palm Bunch Ash in Organic Agricultural Production in Nigeria**. Report and Opinion 2010;2(12):52-54]. (ISSN: 1553-9873). <http://www.sciencepub.net>.

Keywords: Empty fruit bunch, Palm bunch ash and Organic agriculture

Introduction

Agriculture was the main stay of Nigerian economy before the oil boom. Agriculture supplied man with food, livestock, clothing and shelter. Subsistence farming was the order of the day as farmers toiled to feed their households and remaining foods are sold. Commercialization of agriculture came with increased population density and was influenced by demographic and market forces. Subsequently, there arose the need for external inputs to fertilize the soils as lands for arable crop production are taken up for house and road constructions and remaining lands are intensively cultivated as bush fallowing and shifting cultivation are no longer practiced. Farmers resorted to the use of agrochemicals such as inorganic fertilizers, improved varieties, herbicides, pesticides and machineries to increased crop yields.

The use of these agricultural inputs especially, the agrochemicals served their purposes at the time of application but their residual effects in our ecosystem are enormous. Excessive application or improper use of agrochemicals could destroy biodiversity on land and in aquatic bodies. It is well known that chemicals have destroyed many beneficial insect species and have caused environmental degradation (Blake, 1994). The ever increasing threat to groundwater pollution from in efficient and indiscriminate use of fertilizers, pesticides and herbicides could lead to eutrophication and ensuing hypoxia of large bodies of water (Jensen and Hauggard-Nielsen, 2003). If the whole scenario

continues unabated, the global community will witness serious changes in our environment otherwise called climate change (Ibeawuchi et. al, 2009). The objective of this paper x-rays some of the uses to which empty palm bunch and palm bunch ash could put in agriculture in order to reduce farmers dependence on agrochemicals.

Organic Agriculture

Organic agriculture is an environmentally friendly system of agriculture. It relies much on system management that excludes external input, especially the synthetic ones. Organic agriculture is defined as an ecological production management system that promotes and enhances biodiversity, biological cycles and soil biological activity that is based on minimal use off-farm inputs and on management practices that restore, maintains and enhance ecological harmony (Bunch, 2000, Mussoff and Odening, 2005). It is currently the fastest growing sector in the range of 20-25% per year globally for over a decade now (Sciallaba and Hattam, 2002). Connor (2004) pointed out that organic agriculture developed in recent times as a response to what is perceived to be polluting of our food supply by modern farming methods and the ensuing degradation of the environment with chemical and other by-products of the industry. Connor (2002), also stated that sustainable agricultural systems rely more on crop rotation, crop residues, animal manures, legumes, green manures, off-farm organic waste, appropriate mechanical cultivation or minimal tillage

to optimize soil biological and natural pest control activities and thereby maintain soil fertility and crop productivity.

The objective of organic agriculture has been to further organic production of agricultural outputs (Ceres, 1993). The advantages of this organic thrust have been overwhelming. Among them is the fact that organic agriculture stops environmental degradation. It offers farmers a much more secure income than when they on only one or two inputs (Osborne, 2009). Thirdly, farmers maintain nutrient balances in soil through locally available organic materials or recycled farm wastes (Hynes, 2009). Soil status nutritionally is better maintained in areas where access to synthetic inputs is limited or where they are too expensive and health hazards posed by pesticides and herbicides fall by the way side (Ceres, 1993).

Relevance of Empty Fruit Bunch (EFB) in Organic Agricultural Production

Oil palm production in Nigeria has risen from 8.2 million metric tones in 1990 to 9 million metric tones in 2001 (FAO, 2002). About 43-45% of this is always a mill residue in the form of empty fruit bunch, shell, fiber and palm oil mill effluent. These residues will accumulate with increasing production. Efforts are geared towards converting these wastes into useful products in energy production, animal feedstock and organic fertilizer.

Empty fruit bunch (EFB) is a useful organic material, though it uses in agricultural production is under-exploited. EFBs are residues left after the fruit bunches are pressed at the mills and represent about 9% of the total residue in palm oil processing (Lim, 2000). Empty fruit bunch is now mainly used as mulch (Hamdan et al., 1998) and when placed around young palms, EFB helps control weeds, prevent erosion and maintain soil moisture. Ibeawuchi et al., (2007) reported the use of empty palm bunch as mulch-manure in yam/maize/cassava crop mixture for high yield and weed control especially in yam and cassava planting.

However, due to current labour shortage, the transportation and distribution of EFB in the field is getting more expensive. This is a known disadvantage associated with organic manures as a result of their bulkiness (Karikari and Yayock, 1987). Currently, there is growing interest in composting EFB, in order to add value and also to reduce the volume to make application easier (Yusir et al., Thambirajah et al., 1995 and Damanhuri, 1998). In composting EFB, other oil mill residues such as the liquid palm oil mill effluent (POME) and poultry manure are added. Suhaimin and Ong, 2001 reported successful composting of EFB for organic

agricultural production. Sabrina et al., (2009) reported the potentials of composted empty palm bunch in the supply of nutrients for crop growth.

Relevance of Palm Bunch Ash in Organic Agricultural Production

EFB as earlier stated, is bulky and the need to recycle it and reduce the volume as well as make its transportation, accessibility and application easier brought about incineration of empty palm bunch. EFB is also used as source of fuel and energy in oil mill and the ashes are thrown away. But, recently, farmers are becoming aware of the use of ash in cultivation of tuber and root crops because it is rich in potassium. Lim, 2000 reported that the ash contains about 30% of potassium oxide and is used as fertilizer. Palm bunch ash is 100% organic fertilizer, an eco-friendly product, 40% cheaper than inorganic potassium, reduces the hazards of using inorganic fertilizer and is used commercially in neutralizing acidic soil effectively (Agriscap, 2007).

Published works on the effect of oil palm bunch ash on yield of crops are limited but few authors who have worked with palm bunch ash reported high yield in crops. Ojeniyi et al., (2009) reported high root yield in the use of oil palm bunch ash on cassava. Safo et al., (1997) found that palm bunch ash increased yield of cowpea as well as increased soil pH, available P and effective cation exchange capacity of Ghanaian soil. Ahaiwe (2008) asserted from his study on performance of palm bunch ash on ginger that highest plant height, highest average leave number and highest yield was obtained in the plot treated with 600g of palm bunch ash. Ojeniyi et al., (2006) found that oil palm bunch ash at 4tons/ha increased significantly yield of maize and its leaf N, P, K, Ca and Mg content.

Conclusion

It is possible to engage in organic agriculture using EFB and Palm Bunch Ash as mulch and organic manure respectively to improve sustainable food production in Nigeria. By-products of palm oil processing can enhance the production of arable crops organically and in eco-friendly manner as well as sustaining food production in order to achieve food security.

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