ORGANIC FARMING AS A SAFE ALTERNATIVE TO TOXIC SYNTHETIC CHEMICALS USAGE IN TROPICAL CROP PRODUCTION

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ABSTRACT

Organic farming ensures that crops are produce in a natural bio diversified state without loss of any productivity. Synthetic chemicals usage in the tropics increases the levels of the environmental and health risks associated with agriculture. Every piece of synthetic material used each day by man to 'improve' the agricultural productivity is either 'polluting' or 'poisoning' the environment. Through these damage to the natural environs by man, more deaths because of serious illness has be recorded. In this work, facts were presented and discussed on how intensive crop production causes problems and ways of ensuring less use of these toxic synthetic chemicals in crop production, especially in the tropical regions of the world. Furthermore, major benefits of organic farming in crop production as well as how organic farming ensures genetic diversity preservation were discussed. This review, reveals how organic farming can reduce adverse environmental impact associated with conventional method of synthetic chemicals usage tradition. The work concludes that practising organic farming in the tropics will be very beneficial especially for future generations.

Keywords: Chemicals, Crop production, Organic farming, Tropics

1.0 INTRODUCTION

We live in an environment that is altered in every way by human activities. Every piece of material used each day is either been 'polluted' or 'poisoned' by humans trying to "improve" the normal lifestyle. Therefore, it is important that we educate ourselves and take interest in what is happening to the earth in order to preserve it.

Definition of organic farming involves the ecological production and management approach that supports and improves biodiversity. It basically minimises the use of inputs and

maximises managements procedures that ensures ecological coherence (NOSB, 1995). However, Hynes (2009) defined organic farming as a system of agriculture that excludes the use of synthetic pesticides, growth hormones, antibiotics, genetically modified seeds and animal breeds, and irradiation. Studies on organic farming have showed that the inherent benefits include decrease in soil erosion (Lockeretz et al., 1981), less use of fossil fuel (Lockeretz et al., 1981), a lesser amount of nitrate leaching (Drinkwater et al., 1998), increase in the carbon sequestration (Drinkwater et al., 1998), little to no use of synthetic chemicals (Le Campion et al., 2020).

In the tropical regions of the world, many farmers that normally use the traditional methods which are comparable to organic farming are now converting to modern methods that involve the use of synthetic chemicals for economic reasons. Therefore, the objective of this review paper is to highlight the major perceived benefits of organic farming on food productivity especially in the tropical region of the world.

2.0 MODERN, INTENSIVE CROP PRODUCTION CAUSES MANY PROBLEMS

2.1 Nitrate Pollution

The use of Application of nitrogenous fertilizers such as urea and ammonium sulphate in the tropical crop production, increases the acidity of the soil (Fageria et al., 2010). This will lead to high nitrate concentration in the environment. Studies have shown that consumption of these high dose of nitrates can cause dizziness, vomiting, abdominal cramps, psychological problems or even be cancerous (Ananata, 2002).

2.2 Accumulation of Heavy Metals

Addition of fertilizers containing heavy metals even as impurities, for example: rock phosphate which has significant amount of lead and cadmium can cause health hazards (Arora et al. 1975; Kostial, 1986)

2.3 Pesticide Pollution

Synthetic chemical pesticides usage on crops can cause harm to man or animals that consume them as food or feed (Nicolopoulou-Stamati et al., 2016). Moreover, some of the pesticides such as the chlorinated ones are non-biodegradable hence pollutes the environment and are very harmful to living organisms including man (Ananata, 2002).

3.0 WAYS OF ENSURING LESS USE OF TOXIC CHEMICALS IN CROP PRODUCTION THROUGH ORGANIC FARMING

3.1 Choice of Crops

Each specific crop variety has its own environmental requirements. These environmental factors affect the crop's growth and yields. When the climate situations are not right, the crop's produce low yields and may be more susceptible to pest and diseases. Organic farming encourages growing of crop varieties suited to the local conditions.

3.2 Crop rotation

This practice involves the movement and changing of crops to different land area each growing season. No crop should be grown on the same site year after year.

3.4 Composting

This is process of application of plant and animal residues such as leaves, fruit skins and animal dung, that have rotted down over time by action of bacteria and other similar organisms to the crops.

3.5 Mulching

The technique of covering the ground were the crops are grown with materials such as compost, manure, straw, dry grass, leaves or crop residues; has the effects of improving crop growth through: decreasing water loss due to evaporation, preventing soil erosion and adding crops required nutrients to the soil.

3.6 Weed Control

Organic farming avoids the use of herbicides which, leave harmful residues in the environment. Therefore, natural forms of weed control are used.

3.7 Natural Pest and Disease Control

Pests and diseases are part of nature. In organic farming aim is not to eradicate them altogether but to maintain an acceptable level.

4.0 MAJOR BENEFITS OF ORGANIC FARMING IN CROP PRODUCTION

Some studies have shown that despite the continuous increase in synthetic chemicals usage in crop production, losses due to pest damage have continued to multiply; therefore, natural control method is still a viable option (HDRA, 1998).

4.1 Safety for People

Synthetic chemicals can easily find their way into food chains and water sources thereby creating health hazards (Aktar et al., 2009). In the tropical regions, it is even more severe as most deaths because of the chemicals usage are from banned ones in Europe and North America (HDRA, 1998). The use of pesticides is restricted in organic farming to avoid causing harm to non-target organisms including humans (Mie et al., 2017)

4.2 Cost

In organic farming all the products used are mostly materials which are already in the home, around the farm or can easily be made. It does not involve much buying of materials from the outside.

4.3 Safety for The Environment

Most synthetic chemical normally used in conventional crop production in the tropical regions are not biodegradable and are harmful to the environment (Jacobson, 1975). In other words, these non-natural synthetic chemicals can stay in the environment for many years causing numerous problems to the ecosystem.

5.0 HOW ORGANIC FARMING ENSURES GENETIC DIVERSITY/ PRESERVATION

Organic farming encourages the cultivation local traditional crops by the farmers. These traditional crops contain a lot of genetic diversity than the modern conventionally bred crops (Murphy et al., 2005). The ability of the crops to differ genetically gives them the ability to resist diseases (Govindaraj et al., 2015).

Organic farming also allows for a number of different crops to be grown together; this helps in protection against diseases and pests and can also serve as insurance for crop failures (Kollas et al., 2015).

CONCLUSION

A sure way to ensure safer environment is through organic farming. The most important benefit of organic farming process is health of the consumers. In addition, organic food is free from genetically modified organisms (GMOs), hormones, and antibiotics, and has little or no chemicals residue (Hynes, 2009). It is important to also note that organic farming helps preserve aquatic life and clean water by minimizing the flow of toxic pesticides into streams, rivers, and lakes. The work concludes that practising organic farming in the tropics will be very beneficial especially for future generations.

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