



Good Management Practices for Agricultural Crops: A Mini Review

Dickson Adom*

Department of Educational Innovations in Science and Technology, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

***Corresponding Author:** Dickson Adom, Department of Educational Innovations in Science and Technology, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

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Abstract

Life on earth largely depends on the production of agricultural crops. Their mass production guarantees food security in global communities. However, poor management practices implemented by some farmers have resulted in less agricultural crop yield as well as disturbance of the stability of several agroecosystems. This short review aimed at highlighting the reasons why agriculturalists must practice good management practices in agricultural crop production. Also, it thoroughly discusses some of the accepted and time-tested management practices for agricultural crops that result in high yields as well as enhance the stability of agroecosystems paramount amongst them are the use of cover crops, crop rotations, intercropping, and good pesticide or fertilizer management. The position of this paper is that it is only when good agricultural crop production management practices are implemented that global communities can meet the food needs of the ever soaring numbers of the human population and maintain the structure and stability of the agroecosystems of farmlands for sustainable production of agricultural crops.

Keywords: Agricultural Crops; Food Security; Cover Cropping; Fertilizer Management; Agroecosystems

Introduction

The maximization of the production of agricultural crops is crucial to the sustenance of the global society as it ensures food security [1]. In developing countries where the livelihood of the population hinges solidly on agricultural production, there is always the need to implement best management practices of agricultural crops at all times. This is key to developing the economic status of such communities. Globally, human population is estimated to reach 9.1 billion in the year 2050 [2] thus, calling for the mass production of agricultural crops to feed these rising numbers. Perpetual supply of food depends largely on effective and sustainable management of agricultural crops. This is essential in averting losses in agricultural crops in the general food supply chain [3,4].

A best management practice is said to be any method or practice that is technically and environmentally sound and which when utilized in agricultural crop production prevents or reduces the common problems related to general agricultural production [5]. Due to the interconnection and complex nature of agroecosystems [6], there is the need to weigh carefully, any agricultural crop

management practice so as not to compromise the interactions between the agricultural crops and their other factors in the physical environment. More importantly, the management practice must not be associated with environmental costs or throw off board, conservation and ecosystem maintenance interests. It's short term and long term objectives must enhance the buoyancy of the land and its biodiversity while factoring its benefits to local communities living adjacent to the farmlands.

There are globally accepted management practices for agricultural crops. These management practices for agricultural crops yield results. They include the use of cover crops, crop rotation, intercropping, agroforestry, soil testing, record keeping, proper water and irrigation management, pesticide and/or fertilizer management as well as tillage systems, amongst others. Paying close attention to these key issues in agricultural crop management would maximize crop yield, enhance soil quality, ensure biodiversity conservation while minimizing general environmental costs. The following section discusses three of the best management practices for agricultural crops which are the use of cover crops, crop

rotation and intercropping as well as pesticide and fertilizer management.

The use of cover crops

Cover crops are plants that are grown to stay low on the ground mostly during the off-season period to prepare the land for the plantation of cash crops. However, White [7] opines that cover cropping could also be a second plantation of an unharvested crop in line with the cash crop. They play significant roles in sustaining agricultural produce in farmlands. They improve soil fertility and soil quality, prevent soil erosion [8] as well as prevent nitrogen leaching or runoffs [9] while improving the quality of water and sustaining microbial biodiversity in the soils [8,10]. They supply essential nitrogen that aids in maintaining pH levels and reduce soil compaction [11]. Cover crops are 'deceitful crops' used in distracting pests from attacking the agricultural cash crops on the farm. Thus, the use of cover crops in agricultural crop plantation is recommended by many agriculturalists as one of the best and sustainable management practices for agricultural crops.

Crop rotation and intercropping

Crop rotation and intercropping are some of the best agricultural crop management practices that have long been used in organic farming and now in conventional farming [12]. Crop rotation is an agricultural practice of growing different or dissimilar crops on the same farmland in different seasons. On the other hand, intercropping is a multiple cropping system whereby two or more crop species are planted simultaneously on the same farmland in one planting season [13]. These agricultural crop planting practices assist in varying the set of soil nutrients, thereby reducing the likelihood of soil erosion. Ball, *et al.* [14] contend that crop rotation ensures that high quality yield of agricultural crops are harvested with less environmental impact on the general agroecosystem. They also contribute positively to the stability of the soil structure, reducing the outbreak of pests, weeds and other diseases on the farmland [13,15]. Crop rotation and intercropping reduce the reliance on chemical fertilizers [16], minimize agricultural crop production dangers [17] and heighten crop yield in comparison with monoculture practices. A 50 years field experiment in the Northern zone of Moldova confirms this hypothesis. Boincean [18] reports that crop rotation implemented at the study site maximized crop productivity in comparison with monoculture.

Pesticide/Fertilizer management

Chemical pesticides use on farmlands in boosting agricultural crop yield is rampant at many places. However, their use must be

sparingly. They must only be used when it is the last option to protect the agricultural crops from parasites. In most cases, organic fertilization such as the use of compost and animal manure [1] for nourishing the fertility of the soil must be chosen over the use of chemical pesticides [19,20]. Agriculturalists must pay close heed to the selection of a pesticide that has very least or no impact on the environment. They must critically consider the chemical solubility, volatility and degeneration characteristics to find out if it would not harm the environment or leach easily through the soil. In the use of chemical pesticides, the 'label is the law' [21]. What this generally implies is that, the application of the chemical as spelt out on the label must be followed meticulously to the latter. They must be correctly applied and used in their proper amounts. Generally, the timing for the application of the pesticide must not be done before rainfall as it is likely to leach or result in runoff which would eventually mar the quality of freshwater. Chemical fertilizers must be well labeled and stored at dry and well ventilated areas where fire stoppage equipments are readily available.

Conclusion

A wise course to be taken to ensure food security in the coming years globally is to carefully implement sustainable agricultural crop management practices such as those discussed. Though the general soil formation and structure differs from one geographical location to the other, these management practices for agricultural crops yield profound benefits to the economies of both developed and developing countries. Agriculturalists and extension officers must make it a priority to educate farmers especially rural farmers on how to effectively implement these sustainable and important agricultural crop management practices to maximize agricultural crop yield while maintaining the pristine nature of agroecosystems.

Bibliography

1. Branca G., *et al.* "Climate-Smart Agriculture: A Synthesis of Empirical Evidence of Food Security and Mitigation Benefits from Improved Cropland Management". Mitigation of Climate Change in Agriculture Series 3: Food and Agriculture Organization of the United Nations (FAO). (2011).
2. UNPFA State of the World Population United Nations: United Nations Population Fund. (2011).
3. Kiaya V. "Post-Harvest Losses and Strategies to Reduce Them". *ACF International: Scientific and Technical Department* (2014).
4. Adom D. "The Role of Good Post-Harvest Management Practices in the Development of the Agriculture Sector in Ghana". *IN Trends and Prospects in Post Harvest Management of Horticulture Crops* (2018): 169-188.

5. CEP Technical Report: 41 "Best Management Practices for Agricultural Non-Point Sources of Pollution". *United Nations Environment Programme* (1998).
6. Menalled S., *et al.* "An Introduction to Principles and Practices of Sustainable Farming". U.S.A: Montana State University, Agriculture and Natural Resources (Farm Management) (2008).
7. WhitePA. "The Growing Business of Cover Crops". *Natural Wildlife Federation* (2014).
8. Sharma p., *et al.* "The Role of Cover Crops toward Sustainable Soil Health and Agriculture - A Review Paper". *American Journal of Plant Sciences* 9.9 (2018): 1935-1951.
9. Schonbeck M., *et al.* "Soil Health and Organic Farming". Cover Crops: Selection and Management Santa Cruz, CA: Organic Farming Research Foundation (2017).
10. Lee D., *et al.* "Success with Cover Crops". The University of Georgia, College of Agricultural and Environmental Sciences, Family and Consumer Sciences. (2016).
11. Rackham R L and McNeilan R. "Cover Crops for Home Gardens. United States: Oregon State University Extension Service, FS 304. (1999).
12. Europe Pesticide Action Network "Crop Rotation - The Forgotten Practice in European Agriculture". European Union: PAN Europe Position Paper (2013).
13. Mousavi S R and Eskandari H. "A General Overview on Intercropping and its Advantages in Sustainable Agriculture". *Journal of Applied Environmental and Biological Sciences* 1.11 (2011): 482-486.
14. Ball BC., *et al.* "The Role of Crop Rotations in Determining Soil Structure and Crop Growth Conditions". *Canadian Journal of Soil Science* 85.5 (2005): 557-557.
15. Riedell WE., *et al.* "Crop Rotation Improves Soil Fertility and Plant Mineral Nutrition". *ResearchGate* (2019).
16. Conant RT. "Rebuilding resilience: Sustainable land management for climate mitigation and adaptation, Technical Report on Land and Climate Change for the Natural Resources Management and Environment Department". Rome: *Food and Agriculture Organization of the United Nations* (2009).
17. WoodfineA. "The Potential of Sustainable Land Management Practices for Climate Change Mitigation and Adaptation in Sub-Saharan Africa". Rome: Food and Agriculture Organization of the United Nations (2009).
18. Boincean BP. The Influence of Predecessors, Varieties, Fertilizers and Crop Rotations on Yields of Winter Wheat in the Long-Term Field Experiment (50 Years Long) in the Northern Steppe Zone of Moldova IN *Izvestia (News) of Moscow Agricultural Academy K.A. Timiriazer* 3 (2012): 115-127.
19. Menalled L., *et al.* "An Introduction to Principles and Practices of Sustainable Farming". Agriculture and Natural Resources (Farm Management). U.S.A.: Montana State University (2008).
20. Sekyere P A., *et al.* "Pesticidal Effects of Extracts from *Hyptis suaveolens* and *Hyptis spicigera* on Cowpea Weevils". *International Journal of Environment, Agriculture and Biotechnology* 3.5 (2019): 1691-1699.
21. LeBlanc B D., *et al.* "Environmental Best Management Practices in Agronomic Crops (Soybeans, Cotton, Wheat, Corn and Feed Grains)". LSU AgCenter Communications, Louisiana State University Agricultural Center (2011).

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