Article: RT0389

Biotica Research Today

Vol 2:10 1075/1077

2020

Good Agricultural Practices: A Working Concept

Mousumi Malo

Assistant Director of Agriculture, Model Farm, Jayrambati, West Bengal (722 161), India

How to cite this article?

Malo, 2020. Good Agricultural Practices: A Working Concept. Biotica Research Today 2(10): 1075-1077.

Abstract

Good agricultural practice (GAP) is a certification system for agriculture that specifies procedures and attendant documentation which must be implemented to create food for consumers or further processing that is safe and wholesome, using sustainable methods. While there are numerous competing definitions of what methods constitute good agricultural practice there are several broadly accepted schemes that producers can adhere to. GAPs require maintenance of a common database on integrated production techniques for each of the major agro-ecological area. They collect, analyze and disseminate information of good practices in relevant geographical contexts. A farmer who practices GAPs can implement proactive food safety control measures to prevent crop contamination. GAP guidelines can be grouped into four categories such as health and hygiene, water quality, soil supplements, and environmental hazards.

Introduction

Food safety or food security has attained an escalating significance over the years both from the perspectives of well being of nation as well as trade and commerce and the production and consumption of safe and nutritious food is mandatory to safeguard the consumers from the jeopardy of food borne complications possessing importance in domestic food business along with for enhanced competitiveness in export markets. It is documented that imperilment can be observed at various stages of food supply chain from the very beginning of primary production such as presence of residues above recommended levels, microbial contamination and hazards due to harmful heavy metals until it reaches to the time of post harvest operations. In this context, implementation of Good Agricultural Practices (GAP) during on-farm activities and post-production methodologies leading to the safest agricultural produces imposes a remarkable role to guarantee a reliable food supply. Nevertheless, this vital conception was evolved in current years considering the expeditiously changeable and globalization of food economy, preferences and promises of a broader array of stakeholders about food production and security, food safety and quality, as well as the ecological sustainability. The essential four pillars of GAP *viz.* economic viability, environmental sustainability, social acceptability and food safety and quality are involved in almost all the private and public sector standards ultimately contributing to Sustainable Agriculture and Rural Development (SARD). A widely acknowledged procedure of multiplication of GAP principles, generic indicators, GAP codes, standards and regulations has been authorized in recent times by the food industry and producers' organizations depending on the ethics of risk prevention and analysis, sustainable agriculture and integrated crop management (ICM) with an intention of

Open Access

Corresponding Author

Mousumi Malo

e-mail: moubckv15@gmail.com

Keywords

Agriculture, Certification, Farmer, Good agricultural practice

Article History

Received in 27th October 2020

Received in revised form 28th October 2020

Accepted in final form 29th October 2020

E-mail: *bioticapublications@gmail.com*

improving traditional farming situations. Good agricultural practices bear the furthermost contribution in enduring consumer's health and it can aid to conduct debate on national policies and performances and also on the arrangement of appropriate strategies to assure that all the collaborators cooperate in this matter and get benefits from the engagement of GAP in food chain.

What is Good Agricultural Practice (GAP)?

The Food and Agricultural Organization (FAO) of the United Nations defines Good Agricultural Practice (GAP) as a collection of principles to apply for on-farm production and post production processes, resulting in safe and healthy food and non-food agricultural products, while taking into account the economic, social and environmental sustainability. GAP engages several recommendations and accessible guidelines or information with the aim of ensuring safety and quality of produce in food chain; capturing new market advantages by modifying supply chain governance; improving natural resources use, workers health and working conditions and creating new market opportunities for farmers and exporters in developing countries (Banzon *et al*., 2013).

Key Elements of GAP

- Prevention of problems before they occur;
- Risk assessments;
- Commitment to food safety at all levels;
- Communication throughout the production chain;
- Mandatory employee education program at the operational level;
- Field and equipment sanitation;
- Integrated pest management;
- Oversight and enforcement;
- Verification through independent, third-party audits.

Potential Benefits of GAP

- Proper acceptance and supervision of GAP standards can improve food safety and quality and other agricultural products also.
- GAP can decrease the danger of non agreement with the national and international rules and regulations, standards and guidelines of the Codex Alimentarius Commission, World Organisation for Animal Health and the International Plant Protection Convention regarding permitted pesticides, maximum levels of contaminants including pesticides, veterinary drugs, radionuclide and mycotoxins in food and non-food agricultural products, as well as other chemical, microbiological and physical contamination hazards.
- It has the capability to promote sustainable agricultural development and fulfil the objectives of national and international environment and social development.

Challenges Related to GAP

- Higher production expenditures especially for record keeping and certification;
- Lack of harmonization between existing schemes;
- Non-availability of affordable certification systems for farmers and exporters;
- Lack of awareness;
- High risk for small scale farmers to capture export market possibilities until they are sufficiently acquainted, technically prepared and well organised;
- GAP protocols does not always encourage all the claimed environmental and social advantages.

Good Agricultural Practices for Selected Agricultural Components

1. Soil

- Improvement of availability and uptake of water and nutrients;
- Enhanced soil biological diversity;
- Replenishment of soil organic matter or organic carbon content and soil moisture;
- Minimization of losses of soil, nutrients and other agro-chemicals through erosion caused by wind or water, runoff and leaching into surface or ground water;
- Adoption of crop rotations, organic manures and mineral fertilizers application, pasture management, rational mechanical and/or conservation tillage practices;
- Maintenance of soil cover to provide a conducive habitat for soil biota;
- Application of different agro-chemicals in proper quantities and at appropriate timing by employing suitable methods considering agronomic, environmental and human health requirements.

2. Water

- Irrigation scheduling after monitoring the actual crop needs and status of soil water reserve to avoid water loss by drainage;
- Prevent soil salinization by applying water only to meet the needs, and recycling water;
- Avoid crops with high water requirement in a water deficient region;
- Avoid drainage and leaching of fertilizer;
- Maintain permanent soil cover and manage water table;

• Restore wetlands and also in situ rain water harvesting.

3. Crop and Fodder Production

• Selection of proper annual and perennial crops and their cultivars to meet the needs of local consumer and market;

• Intercropping, crop rotation, sequential cropping and cover crops;

• Select varieties by taking into consideration the sowing or planting time, productivity, quality, market acceptability, nutritional value, disease and stress resistance, edaphic and climatic adaptability, and response to fertilizers and agrochemicals;

• Weed control by prevention, mechanical, cultural, biological and chemical methods;

• Provision of non-host crops to minimize disease and inclusion of legumes to provide a biological source of nitrogen;

• Apply organic manures and inorganic fertilizers in a balanced fashion, with proper methods and equipments at adequate intervals.

4. Crop Protection

• Cultivation of disease and pest resistant crops and cultivars, crop and pasture rotations, disease breaks for susceptible crops, and judicious utilization of agro-chemicals;
• Integrated Pest Management options;
• Crop sequences, associations and cultural practices that maximize biological prevention;
• Maintain regular and quantitative assessment of the balance status between pests and diseases and beneficial organisms of all crops;
• Adopt organic control practices and application of pest and disease forecasting techniques.

5. Harvest and On-Farm Processing and Storage

• Food produce should be stored under appropriate conditions of temperature and humidity;
• Harvest food products following relevant pre-harvest intervals and withholding periods;
• Provide clean and safe handling for on-farm processing of products;
• For washing, use recommended detergents and clean water;
• Store food products under hygienic and appropriate environmental conditions;
• Pack food produce for transport from the farm in clean and appropriate containers;
• Training of staff and proper maintenance of equipments.

6. Energy and Waste Management

• Establish input-output plans for farm energy, nutrients, and agrochemicals to ensure efficient use and safe disposal;

• Adopt energy saving practices in building design, machinery size, maintenance, and use;
• Adopt alternative energy sources to fossil fuels like wind, solar, bio-fuels;
• Recycle organic wastes and inorganic materials;
• Minimize non-usable wastes and dispose them;
• Store fertilizers and agrochemicals securely and in accordance with legislation;
• Establish emergency action procedures to minimize the risk of pollution from accidents;
• Maintain accurate records of energy use, storage and disposal.

GAP-Resource Use Efficiency and Sustainability

Some of the practices for promoting resource use efficiency and sustainability of agriculture are listed below:

• Zero tillage
• Crop residue management
• Furrow-irrigated raised bed system (FIRBS)
• Permanent bed
• Integrated watershed management
• Precision agriculture
• Integrated nutrient, weed and pest management
• Crop diversification
• Role of legumes in systems
• Laser land leveling
• Contract farming

Conclusion

Good Agricultural Practices (GAP) may be regarded as improved opportunities to endure the agricultural sustainability from various aspects involving safekeeping of ecosystem and natural resource base, recuperation of food quality and food safety and assuring food security by the means of advanced production technologies. Concerns have become prominent with reference to the beneficial impacts of Good Agricultural Practices on the livelihoods of small and marginal farmers especially in developing countries. It is registered that there are also certain type of anxieties *viz.* inflexible modern GAPs can marginalise small cultivators, interrupt the accessibility to the export markets throughout the globe and impose unnecessary excessive production expenditures on farmers. On the contrary, Good Agricultural Practices or GAPs may furnish the accelerator for betterment of production methodologies and also supply chain infrastructures engaged in processing, storage, transportation etc. in developing countries.

Reference

Banzon, A. T., Mojica, L. E., Angela, A. and Cielo, A. A., 2013. Adoption of Good Agricultural Practices (GAP) in the Philippines: Challenges, issues, and policy imperatives. Journal Policy Brief Series - Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA). Available on: http://beta.searca.org/searca/index. php/knowledge.