

## **Ensuring Food Safety in Grapes through Good Agricultural Practices**

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### **Abstract**

With the changing pattern of food consumption some life taking food borne diseases have emerged since last few years and consumers are increasingly conscious about the food safety and health issues. To address the issue of food safety, agriculturists and policy makers of different countries have taken up certain measures to ensure sanitation of agricultural produce right from the farm to the table. Good Agricultural Practices (GAP) is one of these standards developed by the Food and Agriculture Organization (FAO) and presently GAP certification is a must for export in most of the developed countries. GAP aims at attaining social, economic and environmental sustainability by following certain criteria right from the planting of crop to the marketing. India with more than 28.2 million tonnes of fruits is the 2<sup>nd</sup> largest producer of fruits in the world. India has the distinction of achieving the highest productivity in grapes in the world, with an average yield of 30 t/ha. More than 80 per cent of the total production is consumed as table grapes in India. Well maintained and established grapes orchards bring better returns per unit area of land than many of the field crops. Approximately, 2.5 per cent (22,000 tonnes) of fresh grapes are exported to the Middle East and European countries through three different agencies viz., grower exporters, growers' cooperatives and the trader exporters. GAP is essential to meet the quality standards of these countries where grapes are exported in large quantity. Since table grapes are consumed fresh, food safety issues are even more relevant to it. Starting from presence of pathogens, pesticide residues to poor handling and packaging, everything can make the produce unacceptable for export. Hence, dissemination of knowledge on GAP for grapes among the stakeholders including grapes growers, line department professionals

and trader-exporters is essential to maintain food safety standards of international market and exploit the huge export potential of grapes.

**Keywords:** Socio-economic impact; climate change; technologies

## 1. Introduction

The world scenario of agriculture is changing rapidly and to maintain a pace with it, new concepts are to be adopted immediately. Indian farming needs to be commercialized in order to maximise farm income and for that we need to meet quality standards and demands in the national and international market. Along with globalization, dramatically changing economy, new inventions in food science and technology and changing pattern of food consumptions, some new contaminants, toxins and additives, physical, chemical and biological hazards have also emerged resulting in huge health risk of the consumer. In 2011-12, nearly 3000 people from 16 countries fell sick due to *e coli* outbreak of contaminated cucumber (Das, 2013). According to one of the reports of World Health Organization (WHO) 11 per cent of all food sold in India are adulterated. Along with the specific diseases like Lathyrism, Epidemic Dropsy some general diseases like heart diseases, diabetes, gastritis, hypertension and even anxiety and depression are found to be correlated with low quality and even poisonous food consumed by millions of people every day. Considering these facts, Food and Agriculture Organization (FAO) and World Health Organization (WHO) came up with certain quality standards, which are a decade old now. Indian farmers and as well as the stakeholders are yet to be familiar with these measures and standards that can help them gain consumer trust and reputation in international market and also to avoid the non-tariff barriers set by World Trade Organization (WTO). FAO and WHO always encourage the countries worldwide to harmonize their standards with those of CODEX Alimentarius Commission (CAC). To set a common understanding about the standards, FAO came up with certain globally accepted control and compliance systems and standards for measures of food safety like Good Agricultural Practices (GAP), Traceability etc.

### 1.1 What is GAP?

According to FAO (2003), Good Agricultural Practices (GAP) are the practices that address environmental, economic and social sustainability for on farm processes and result in safe and quality food and non-food agricultural products. GAP can be said as a control and compliance system with four major pillars namely economic viability, environmental sustainability, social acceptability and food safety & quality. Objectives of GAP are -

- Ensuring food safety,
- Capturing new market,
- Judicious use of natural resources,
- Maintaining worker health and welfare,
- Income generation,
- Enhancing international trade,

- Risk assessment
- Building consumer confidence.

There are certain critical parameters like traceability, record keeping, site history, soil management, fertilizer use, irrigation, crop protection, harvesting, produce handling, waste and pollution management, health and welfare of worker and environmental issues based on which the standardization agencies declare a GAP certificate to one or a group of producers. But the major challenge in Indian context at present is creating awareness about GAP among the farmers, stakeholders and also the retailers. The compliance with food safety practices applicable at the farm level is not very encouraging. The adoption intensity of food safety practices varied from 0.42 in Bihar to 0.57 in Punjab. This implies that farmers are adopting only 42 to 57% of the food safety measures at the farm level ([Kumar et al., 2011](#)). While WTO poses some challenges, it also offers tremendous opportunities for Indian agricultural producers and to explore it educating the stake holders as per the requirement is a must.

### ***1.2 Relevance of GAP in Horticultural crops***

India with diverse soil and climate comprising several agro-ecological regions provides ample opportunity to grow a variety of horticulture crops. Though these crops occupy hardly 7 per cent of the cropped area, they contribute over 18 per cent to the gross agricultural output in the country. India with more than 28.2 million tonnes of fruits is the 2<sup>nd</sup> largest producer of fruits in the world. Well maintained and established grapes orchards bring better returns than many of the field crops. From a unit area of land more yield/ income is realized than any of the agronomic crops. Grapes (*Vitis sp.*) cultivation is one of the most remunerative farming enterprises in India. India has the distinction of achieving the highest productivity in grapes in the world, with an average yield of 30 t/ha. More than 80 per cent of the total production is consumed as table grapes in India. Approximately, 2.5 per cent (22,000 tonnes) of fresh grapes are exported to the Middle East and European countries. The rest of the produce is marketed within the country. Grapes are exported through three different agencies viz., grower exporters, growers' cooperatives and trader exporters. GAP is essential to meet the quality standards of these countries where grapes is exported in large quantity. GAP certification can further upgrade the value of the produce in urban market, especially among the high society customers and can help the growers to fetch remarkably higher price. Grapes being highly commercially important crop can further be exploited to fetch more foreign exchange in the country.

### ***1.3 Importance of GAP for grapes***

At present, the area under grapes cultivation in India is 111000 ha (NHB stat 2011) with the production of 1235000 tonnes. Table grapes cultivation is mostly concentrated in peninsular India like Maharashtra and Tamil Nadu with Maharashtra being the largest producer (75.33 per cent). Grapes is the highest among all the fruit crops to earn foreign exchange and is also creating employment opportunities for farmers, farm labourers, exporters, traders and others who are associated with it. Following the criteria of GAP can further help the stakeholders to attain international

standard and thus to explore more opportunity for export and eventually to upgrade their economic status. GAP in terms of training, pruning, vineyard management, irrigation, fertilization, crop protection, appropriate stage of harvesting, method of harvesting, packaging, storing and transporting are important and these practices also ensure the safety of the produce. Grapes growers of India are highly dedicated and committed group and it's their own effort that has made the Indian grapes cultivation to establish a position in the world grapes trade. Now the time has come that not only the elite group of farmers but also the small and marginal unorganized farmers need to be aware of GAP. The Inter-Ministerial Task Force on Agricultural Marketing Reforms in their report in May, 2002, suggested several measures for undertaking various reforms in the Agricultural Marketing System in the country. In view of the keen competition in the domestic as well as international markets, it has become imperative to launch awareness programmes vigorously to up-date the technical know-how of various stakeholders involved in the marketing of farm produce in multi-dimensional aspects of agricultural marketing system.

## **2. How To Create Awareness About Gap**

GAP is comparatively a new concept and even a newer one in context of Indian agriculture. It is obvious that the change which is being talked about regarding farm practices will not take place over night. Appropriate ways of disseminating information, communicating farmers and mostly educating them about GAP and its importance are to be thought of. Along with the traditional methods of communication a number of innovative teaching methods are now under discussion. At present we require some media which can reach maximum number of farmers in the shortest duration without losing the specificity and for this we have to supplement our traditional extension methods with modern ideas and teaching aids. These aids if effectively used can bring phenomenal change in the awareness level of stakeholders about GAP and thus eventually lead to high rate of adoption of food safety measures and safe cultivation practices. One such innovative communication and teaching method will be discussed here that is e-learning, a tool of Information and Communication Technology.

### **2.1 ICT and e-learning**

Information and Communication technology includes everything ranging from radio to satellite imagery to mobile phones or electronic money transfer. It is a set of technological tools to create, disseminate, communicate, store and manage information. Information is the biggest strength of human being which leads to knowledge generation and knowledge management. A well informed person is always a step ahead to handle any kind of situation with a readiness and preparedness, so providing right information at place is a must to enhance the socio economic status of the Indian farmers and thus can brighten the face of Indian agriculture. ICT combines the advantages of both the traditional face to face communication and mass media. But it is to be kept in mind that ICT is not a replacement but is a supplement to the traditional extension methods.

One of the recent inventions of ICT is e-learning that is the use of [electronic media](#) and technology in education. E-learning is [broadly inclusive](#) of all forms of [educational technology](#) in [learning](#) and [teaching](#). E-learning includes numerous types of media that deliver text, audio, images, animation, and streaming video, and includes technology applications and processes such as audio or video tape, satellite TV, CD-ROM, and computer-based learning, as well as local intranet/extranet and [web](#)-based learning.

E-learning got momentum with the invention of World Wide Web in the 1990's. Though to a lesser extent e-learning has made its way in India also. Today a number of learning modules are available on market from kindergarten to university level but using e-learning to educate Indian farmers is a brand new concept. E-learning is based on the humanistic philosophy of education that gives highest priority to learner and aims at active participation of learner. Learner centred education prioritizes needs of learner, their cognitive level, unique learning styles, problems and past experiences. Merging this humanistic and reflective concept of education with Information & Communication Technology (ICT), a new method of interactive learning has emerged namely e- learning.

With all these above mentioned advantages e-learning can successfully be utilized for educating farming community or those who are directly or indirectly related with agriculture. Not only the farmers but the researchers, agricultural students and scientists, extension professionals also require to be updated on regular basis about new technologies and ideas and this can be done through e-learning. E-learning modules can meet this need by providing information relevant to farming in a capsule form over a large geographic area saving time and cost.

### **3. Designing E-Learning Module On Gap For Grapes**

The importance of awareness about GAP for the grapes growers of India has been mentioned above already. At present the situation demands a methodology that will effectively educate the stakeholders about GAP principles, criteria, pre-harvest and post-harvest safety measures in shortest possible time. For this designing an e-learning module on GAP for grapes is thought to be an innovative measure.

The probable target clientele of the module are grapes growers, exporters, traders and also KVK scientists and line department staff. The module will attempt to provide information on GAP for grapes and its importance in international market in a nutshell. Guidelines regarding different criteria of GAP and food safety standards are to be provided. Guidance regarding selection of suitable table grapes varieties, level of chemical use, vineyard management, process of harvesting, post-harvest operations in compliance with food safety standards are to be provided. Attempt is to be taken to make the module interactive, interesting to learner with provision of direct feedback keeping in mind the need of adult learner.

#### 4. Conclusion

The wide range of geographic and climatic variation, seasonality, presence of a number of cultural and ethnic groups with different languages make Indian agriculture remarkably diverse and challenging but at the same time there is ample opportunity to make use of the vast natural and human resources this country has naturally. Post-independence policy makers of India concentrated mostly on production enhancement and after the success of green revolution production is no more the problem of Indian agriculture. Now the challenge lies in integration and utilization of resources we already have. The time has gone when only two times bread and shelter were thought to be enough for Indian farmers. It is high time that Indian farming is to be exposed to the international scenario so that it can maintain a pace with the world food trade and for this the fast and foremost requirement is educating our farmers about the international standards and demands. To educate the farmers the extension professionals also need to be up to date and well informed. Keeping in mind all these needs, the idea of designing an e-learning module has been discussed thoroughly in this paper with its focus on a recent issue like GAP for grapes which is at present a very much commercially important crop in India.

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