

## A Study On Increasing Trend Of Scientific Methods In Agriculture

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### **ABSTRACT**

*India is an agriculture prone country. Most of the people get their earnings from the agricultural activities. Hence, it is very important for the farmers to get higher percentage of production of crops so that they can get a good amount of profit. But, in some cases, it is observed that farmers have to face loss as their crops are destroyed due to some natural disasters like flood, drought or any other external factor.*

*In some cases, it is observed that the farmers can't get enough prices for their crops that they can recover the cost of production of the crops. The reason behind this problem is that the basic components needed for the irrigation are very costly. Hence, to avoid these kinds of problems, the farmers are approaching towards the scientific methods in the agricultural activities so that the level of the production of the crops can be raised effectively. The current paper highlights this increasing trend of scientific methods in the field of agriculture.*

### **KEYWORDS:**

*Agriculture, Crop, Farmer, Production*

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## INTRODUCTION

There are a number of scientific methods that are adopted by many farmers. Among these methods, one is vertical farming which is proving to be a useful method for the farmers in increasing the overall production of the crops.

The biggest advantage of the vertical farming is that it makes it possible to produce any crop in any season of the weather. Hence, it can be said that with the aid of the vertical farming, the farmers get full season of twelve months to cultivate a crop irrespective of the weather conditions which provides flexibility for the farmers.

With the help of scientific method of vertical farming, it has been easier to produce the higher level of organic crops. The production level of these organic crops can also be raised easily with the help of the scientific ways in the agricultural activities.

Another big advantage of using scientific ways in the agriculture is that it offer the facilities of conserving the natural resources which is very needful thing to have as the conservation of the natural resources has also been compulsory due to increase in the level of the global warming all over the world. In the scientific activities, less amount of water is needed as compared to the traditional way of agriculture which leads to the conservation of the natural resources in an effective way and therefore, a number of farmers are attracting towards the scientific way of agriculture.

It is observed that the process of recycling the natural resources can be done easily with the help of scientific methods like vertical farming in the field of the agriculture. For example, urban sewage waste can be recycled and reused.

Also, the scientific methods of farming are supposed to be environment friendly as the dependency on the land resources tends to decrease and consequently, the process of re-growth of the forests takes place. This also helps in decreasing the level of carbon dioxide in the atmosphere and hence, the environment can be conserved effectively with the help of the scientific ways.

These days, the trend of the organic farming is also increasing. Organic farming is also known as the ecological agriculture. This kind of farming also tends to be eco-friendly as it does not affect any natural resource. In this case, the nutritional management of the soil is achieved by the agricultural practices such as crop rotations and implementing the ways to enhance the fertility of the soil.

In organic farming, there is no need to use any kind of pesticides to preserve the crops and hence, the purity of the crops yielded as a result of this kind of farming can be maintained easily with the help of the scientific methods like vertical farming and organic farming in the agricultural activities.

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## **INCREASING TREND OF SCIENTIFIC METHODS IN AGRICULTURE**

### **Plant Genomics**

Farmers are trading in overalls for white coats as they enter the world of genomics, a field that is fine-tuning the crops they grow. Advancements in plant genomics are designed to create higher yields, to enhance the taste of produce, and to grow plants with additional nutrients.

The loosening of state and federal regulations on cannabis growers has opened the door for more experimentation, as growers develop beneficial and more reliable marijuana strains. Genomics is also allowing for the miniaturization of crops, essential to increase yields within confined spaces.

### **Harvest Strategies During Peak Nutrient Growth**

Microsoft, the software giant, is now going into farming. The company has on-site hydroponic farming facilities in the Pacific Northwest where it is experimenting with a wide range of technologies such as analysis software, onboard cameras, hydroponic towers, and targeted lighting. Microsoft's agricultural specialists are working to optimize the development of a broad spectrum of food crops. One particular example has the company producing from a number of small sites 6,350 kilograms (14,000 pounds) of lettuce annually.

Microsoft is developing tools for farmers to track growth data, weather conditions, customer transactions, and the total number of food orders to predict how much a farmer should grow over the course of one season. So far their predictions are 90% accurate. What this means is that nearly everything the farmers plant is being consumed with little in the way of waste by season's end.

### **Food Tracking to Reduce Recalls**

The E. coli strain attack that triggered the recent recall of romaine lettuce accelerated the need for more advanced tracking and tracing of an assortment of food crops. While the technology to monitor plant growth is making immense strides, there remains more to be done to track how plants are handled during harvesting and shipping to trace sourced of mass contamination.

In a recent Consumer Reports online editorial it states, "It could be difficult for consumers to determine where the romaine they purchase is from, which is why they believe it's best to avoid the lettuce altogether." Consumers cannot be expected to trace lettuce in their salad served at a restaurant to a particular grower or location.

Such scenarios create nightmares for farmers as well as food distributors and grocers as millions of dollars are spent and wasted because it is impossible to pinpoint the source of the health risk. That's why developers are designing smart technology that utilizes

genetic, molecular, or radioisotope tracking to trace and assess the health of food crops as they move through the supply chain from the field to grocers' shelves.

### **Vertical Farming in the Urban Backyard**

Vertical farming has come to urban areas. The concept isn't new but growers' ability to refine methodologies is turning the practice into a regular occurrence. The challenge for business owners involves creating a sustainable business model while keeping down the cost of overheads.

Companies such as Aero Farms and Bowery have engineered large-scale vertical farms in the exurbs. By using data science, Aero Farms produces crops without the need for sunlight or soil. Their moisture-driven indoor farms provide all the nutrients plants need to grow with absolute precision without sacrificing the plants' nutrient value in the process. A key benefit of these vertical farms is that they grow food in a safer environment, protected from unstable weather patterns and natural disasters that can impact outdoor farms. And once indoor vertical farming is perfected it means it can be taken anywhere even into space.

### **DISCUSSION**

As indoor farming becomes more visible it will continue to change the face of agriculture. Farmers face the challenges of climate change.

Cities are looking at ways to source locally grown produce to cut down on transportation greenhouse gas emissions. Food service companies and restaurants are heeding the request by their customers to buy and be served food that is less carbon-intensive, and healthier. For farmers, it means rethinking their business by embracing these new technologies. And it likely means that the face of farming as the 21st century unfolds will be far different from what we have seen in the past.

Achieving sufficiency in food production along with the conservation of the environment are the major objectives of the agriculture presently. The constraints in achieving this task are: limiting land and water resources along with the degradation of the environmental health due to excessive use of chemicals for nutrition and pest management in agriculture. Anthropogenic activities for development have resulted in further degradation of environment and have spurred the rate of climate change. Global efforts have been initiated for reducing the effects of climate change on earth in general and agriculture in particular. These steps should be complimented with the innovations in production techniques employed in agriculture and also scientific utilization of the indigenous knowledge which is proven as more sustainable.

The two different methodologies of agriculture elaborated above can be integrated in the current agriculture system without many

disturbances and can be adopted on a global scale. Vertical farming, which is a recent concept in agriculture, has great potential considering the falling land resources for agriculture due extensive urbanization and increase in per capita income of the developing nations. The methodology though a new concept for the developing nation, is of great promise and can efficiently meet the challenge in terms of quantity, quality and variety. Organic farming on the other hand is a well known concept in agriculture, but requires further exploration and integration of scientific knowledge for incorporation in the main stream agriculture to feed the growing demands. These two different methodologies, with separate principles are promising avenues for global agriculture and require further exploration in terms research and integration in main stream for healthier environment and well fed world.

## **CONCLUSION**

Thus, in conclusion changing demographic trends and technological advancements are delivering new innovations in the field of agriculture. These emerging technologies are required to be used judiciously to meet the growing demands from modern agriculture. Vertical farming and organic farming can be adopted as the viable alternatives for the conventional agriculture to meet the changing demands and needs of mankind. Further, constraints in adoption of



such practices should be addressed and linkages between researchers and farmers should be created for suitable measures.

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