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Review Article

How Precision Farming is Better than Traditional Farming?

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Abstract

Farming has empowered human populaces to overwhelm the world's landscapes for a long time. The study of farming has been refined and consummated over the long haul to oblige for the steadily expanding human populace. Traditional Agriculture can be characterized as a crude style of meals creation and cultivating that includes the depth utilization of native arrangement, land use, traditional tools, regular assets, normal compost and social convictions of the farmers. It's far nevertheless the dominant agricultural food or production exercise used by half of the world's population nowadays. Precision farming or precision agriculture is tied about doing the right aspect, inside the right region, inside the legitimate way, at the appropriate time. Overseeing crop production inputs alongside water, seed, manure, etc to increment yield, top notch, income, and diminish wastes. The purpose of precision farming is to healthy agricultural inputs and practices as in keeping with crop and agro-climatic situations to improve the accuracy in their applications. GPS generation allows in site exceptional data to be accumulated through connect with satellites that is satisfactorily exact for use for sorting out precision agriculture input use. The GPS permits makers to see areas inside the field with the guide of scope and longitude so that data sources might be completed in view of execution and previous enter bundles. A GPS receiver can be associated with farm hardware to degree inside-field changeability. For instance, changing over the crude data gathered with the satellite television for pc with GPS programming can deliver a yield map. In traditional agriculture, the concept is handiest to yield or harvest. In correlation, present day agriculture as of now has been seeking profit or misfortune. It has completed the possibility of the monetary framework to give a product it calls to capital expenses with predictable income and investigates the achievability of a business undertaking you run. With the rising strain on producers to deliver better yields, an interest in precision farming may be a reasonable choice through farmers as it'd over the long run cause further developed profit, a solid environment, and the advancing of sustainable cultivating.

Keywords: Precision; Farming; Traditional Farming

Introduction

Traditional farming

Traditional Farming can be characterized as a crude way of cultivating that includes the escalated utilization of native information, conventional instruments, regular assets, natural compost and social convictions of the farmer. It is essential that it is yet utilized by around half of the total populace.

Features of traditional farming

- Extensive farming with primitive understanding and tools.
- Use of native instruments like axe, digger, and stick.
- Technique: Slash and Burn and Shifting Cultivation.
- Cattle raisin assists with making neglected land.
- Absence of responsibility and obligation to the Environment.
- Require surplus creation.

The five indigenous cultivating strategies that is as yet famous today are as per the following

Agro forestry

Agro forestry is one of the most established cultivating techniques that has been utilized since before times. It is essentially planting and keeping up with trees that can safeguard the yields by fostering the microclimate. It is an administration arrangement of land use in which trees are developed around the harvests. This ranger service procedure is valuable in controlling the temperature, openness of daylight, wind and downpour. This mix of horticulture and forestry service has countless advantages. Because of this strategy, we can get different items like food, wood, kindling and so forth. Staple food crops which can't be delivered in any case can be developed. Agro forestry not only has environmental benefits, but it also offers increased productivity in social and economic factors. Due to all these benefits, it is still a very popular farming method.

Crop rotation

Crop rotation idea was established by incredibly famous earthy person Dr. Vandana Shiva. The act of developing various harvests on a similar land in view of seasons is crop rotation. It enjoys a great deal of benefits. It helps in safeguarding soil productivity, reducing disturbances, restricting usage of chemical compounds, augmenting yields, decreasing reliance on one nutriens and making weeds. Prior the rotation was finished utilizing two field systems, which went up to four field systems. The inter relationship of crop relies upon how it adds to soil and delivers hybrid offspring while interbreeding with other yield the executives' systems that controls soil disintegration and affects the general climate at large.

Intercropping/Mixed crops

Planting multiple harvests simultaneously is Intercropping/ mixed cropping. Generally, the assets are not used as expected by a solitary harvest. Thus, to deliver a more noteworthy yield on land intercropping is utilized. There are different techniques for intercropping.

Poly culture

Poly culture is a framework to develop many plants of various species in a similar region. It builds plant biodiversity and helps in advancing the variety in diet in nearby communities that are adaptable to environmental variation and outrageous atmospheric conditions. The different sorts of poly culture are cover cropping, perma culture and incorporated hydroponics.

The principle benefit of poly culture is its capacity to control weeds, irritations and illnesses without the use of synthetic compounds. It helps in decreasing soil disintegration and expansion in stable yields. It works on the nature of soil. Consequently, poly culture being the conventional technique is as well known today across the world as it gives wellbeing and ecological advantages.

Water harvesting

Strategy used to gather and store rainwater which can be utilized later for agrarian object is 'water harvesting'. It is either gathered from a rooftop like surface or put away profound pit in a well. During rainy season, the water is gathered from streams or a waterway which is subsequently involved by farmers amid dry spell or restricted precipitation. To build the reasonable creation of farm and food security, new techniques are being created in water reaping.

Effect of traditional agriculture on Environment

The effects of traditional agriculture on Environment are listed below

- **Exhaustion of Nutrients:** The crude way of ranching like slash and burn diminishes the organic matter from the soil and inside the brief timeframe the nutrient content of the soil taken up by the harvests. This makes the farmers move to somewhere else for cultivation.
- **Deforestation:** It is the course of the evacuation of a forest or stand of trees where the land for the change of forestland to ranches, farms, or metropolitan use. The most packed deforestation happens in tropical rainforests. The slash and burn, and shifting cultivation required gigantic chopping down of the woods which prompts deforestation.
- **Soil Erosion:** It is a course of the expulsion of topsoil by the regular actual powers of water and wind or through powers related with cultivating exercises like tillage. The underlying foundations of the plant and trees strongly hold the soil, yet the deforestation presented the soil to get dissolved by

the enduring powers like downpour, wind and storms which causes the deficiency of top fertile soil.

- **Precision farming:** Precision Farming (PA), as the name says, suggest the usage of pre and right proportions of information sources like water, manures, pesticides, etc at the right opportunity to the harvest for growing its value and intensifying its yields. The usage of information hotspots (for instance chemical fertilizers and pesticides) considering the perfect sum, with perfect timing and impeccably found. This kind of board is generally known as "Site-Specific Management". Advancements are utilized, as a matter of first importance, to gather the information and data expected to settle on choices on the best way to support creation and also to set up the fundamental corrective activities to accomplish this objective. Developing yields through precision production practices may be depicted as "organic production"- consolidating bio-dietary innovation, process control innovation and sensing/estimating/checking technology to control and upgrade efficiency and plant growth. The idea of precision farming is completely founded on the Global Positioning System (GPS), which was at first evolved by U.S. (United States of America) defense researchers for the elite utilization of the U.S. Defense Department. The solitary feature of GPS is accuracy in existence.

John Deere was first to present this innovation utilizing GPS location information from satellites. A GPS-associated regulator in a farmer's farm vehicle consequently guides the hardware in light of the directions of a field. This lessens directing mistakes by drivers and subsequently any crossover passes on the field. Thusly, this outcomes in less squandered seed, manure, fuel, and time.

The principles of precision agriculture

In this century, innovation is a fundamental point for any area. Precisin farming takes on the improvement innovation and joins it with an agrarian guiding principle. A cultivating system should meet the fundamental standards, which by and large take on the essential standards of sustainable development. Coming up next are principles of precision farming

- Precision agriculture can better soil management and crop rotation while maintaining soil quality and water availability to maintain agricultural production in the long term.
- Sustainable agriculture can protect, recycle, replace, and maintain the natural resource base such as soil, water, and biodiversity, contributing to the protection of natural capital.

Tools and equipements

Precision Farming is a mix of utilization of various advancements. This multitude of mixes are commonly inter-related and answerable for improvements. The equivalent is talked about underneath

- **Global Positioning System (GPS):** It is a set of 24 satellites in the Earth circle. It conveys radio transmissions that can be handled by a ground beneficiary to decide the geographic situation on the planet. It has a 95% likelihood that the given situation on the earth will be inside 10-15 meters of the real position. GPS permits exact mapping of the farms and along with fitting programming advises the rancher about the status regarding his yield and what portion of the ranch requires what info like water or compost and additionally pesticides and so forth.
- **Geographic Information System (GIS):** It is software that imports, exports and operates spatially and temporally geographically conveyed information. One convenient component of GIS is examining different farm management choices by looking at and controlling information layers.
- **Grid Sampling:** It is a technique for breaking a field into matrices of around 0.5-5 hectares. Sampling the soil inside the grids is helpful to decide the suitable pace of use of manures. A few examples are taken from every grid, blended and shipped off the research laboratory for examination.
- **Variable Rate Technology (VRT):** The current field hardware with added Electronic Control Unit (ECU) and installed GPS can satisfy the variable rate prerequisite of information. Spray booms, the Spinning disc implement with ECU and GPS have been utilized successfully for fix showering. During the production of nutrient prerequisite map for VRT, benefit boosting manure rate ought to be viewed as more as opposed to yield amplifying fertilizer rate.
- **Yield Maps:** Yield maps are created by handling information from adjusted join reaper that is equipped with a GPS, for example coordinated with a yield recording system. Yield

mapping includes the recording of the grain move through the join reaper, while keeping the real location in the field simultaneously.

- **Remote Sensors:** These are by and large classes of aerial or satellite sensors. They can show varieties in the shades of the field that compares to changes in soil type, crop improvement, field limits, streets, water, and so forth Arial and satellite imagery can be handled to give vegetative lists, which mirror the wellbeing of the plant.
- **Proximate Sensors:** These sensors can be utilized to quantify soil parameters like N status and soil pH) and yield properties as the sensor connected tractor passes over the field.
- **Computer Hardware and Software:** To examine the information gathered by other Precision Agriculture innovation components and to make it accessible in usable arrangements, for example, maps, diagrams, outlines or reports, PC support is fundamental alongside explicit software support.
- **Precision irrigation systems:** Late improvements are being delivered for commercial use in sprinkler irrigation by controlling the irrigation machines movement with GPS based regulators. Remote correspondence and sensor innovations are being created to monitor soil and surrounding conditions, alongside activity boundaries of the irrigation machines (for example flow and strain) to accomplish higher water use efficiency.
- **Precision farming on arable land:** The utilization of PA strategies on arable land is the most broadly utilized and generally progressed among ranchers. CTF (controlled Traffic Farming) is an entire farm approach that targets keeping away from additional yield damage and soil compaction by large equipment, decreasing expenses forced by standard strategies.

Significant Benefits of Precision Farming

A few ways in which Precision Farming can Benefit ranchers.

Decreased costs

One of the main benefits of precision farming is the capacity to definitively reduce herbicide, manure, and seed rates in regions where they are not savvy. By utilizing sensors and programming's to concentrate on the crop wellbeing, farmers can get bits of knowledge on how much manure or herbicide required, in light of the crop wellbeing, and this data can help them over the long haul.

Expanded profitability

The cost sheet of a farmer is regularly a wellspring of fear and destruction. Precision farming assists with bringing down a farmer's expenses by diminishing the requirement for compost, pesticides, and herbicides. Farmers are seeing significant decreases in how much cash they spend on these previously mentioned materials throughout a rising season since technology is utilizing the parts sparingly and just when they are expected instead of the crude methodology. Technology along these lines assists them with setting aside their cash and incrementing their benefits.

Capacity to make informed decisions

Data doesn't lie, and instinct and information will just take farmers up until this point. Establishing trees, crop rotation, soil conservation, and reaping are totally made more straightforward with the information that farmers can get from their set-up of farming-based innovation instruments. With this data readily available, farmers can now settle on more savvy choices about what occurs on the farm.

Continuous investigation of information

Farmers are continually being compelled to settle on significant choices on the fly nowadays. Precision Farming can help by utilizing state-of-the-art technology to accumulate vast volumes of information about yields and fields, investigate it, and convey it to ranchers. A robot sensor is one such system that farmers can put in their fields to consider persistent yield and harvest management. The sensor essentially records and investigates significant information about the land, harvests, and water, then sends the outcomes to the farmer immediately. Continuous information is likewise valuable for following atmospheric conditions, which can assist farmers with expecting and effectively defeat issues like the adverse consequences of outrageous heat or cold.

Get significant bits of knowledge

Precision Farming can assist farmers with taking full advantage of their assets without adding to their responsibility. One strategy is to utilize a mapping apparatus that permits farmers to screen

field conditions and lay out an ideal establishing plan. They might utilize the gadget's information to decide the best crop to plant at a given season, how much compost to utilize and when-and what portions of the field might require hydration.

Minimizing the risk of leaching

Minimizes the risk to the climate especially regarding nitrate leaching and groundwater pollution through the optimsation of agrochemical items.

Upgrade crop management and check water waste

Monitored airplanes and drones, particularly those outfitted with cameras, are turning out to be progressively famous. A drone's camera, for instance, can catch many high-resolution pictures in no less than a few moments while flying over a field. The system then, at that point, gives farmers instant flying perspectives of the farm that they wouldn't see on the ground.

Aerial spectral imaging for precision farming is ending up an important "eye overhead" that helps farmers in dealing with the development of crops all the more proficiently consistently. Man-made airplane with cutting edge cameras that catch data and very precise pictures at different frequencies are utilized in this technology. Farmers might utilize numerical and organic demonstrating to cross-reference data with the genuine actual condition of the farm, for example, water levels, plant conditions, and potassium and nitrogen content.

Challenges faced by farmers in India in embracing precision farming

- **Absence of mindfulness:** It has been seen that most of the farmers are uneducated which affected their mindfulness level about the upcoming advances. They do not have a lot of information about the kinds of modern technologies accessible. Likewise, a few farmers showed a low degree of interest in taking on these advances as they are not sure on the return they will get.
- **Low ROI on technology:** Many farmers reported that the cultivating advances require immense venture, and the profits are not quick. They need to trust that seasons will recover the venture. Some even expressed that they need more produce to arrange fund for investment.
- **Inadequate monetary help:** Most of the respondents were the sole bread workers for their loved ones. The number of wards was likewise more than three individuals. This factor has been difficult for a portion of the farmers as they can't generate funds expected to carry out advancements. In India many of the farmers are already suffering because of unstable credits the nearby loan specialists who charge immense interest from them.

Why do farmers need to adopt precision farming nowadays?

Precision farming is a methodology where data sources are used in exact sums to get expanded average yields, contrasted with traditional cultivation strategies. Justifications for why ranchers ought to adopt precision agriculture these days

- It increases agricultural yields.
- Assists in preventing soil degradation.
- There is a reduction of chemical applications in crop cultivation.
- Proficient utilization of water resources.
- There is dissemination of current farm practices to work on quality, amount, and decreased cost of creation.
- Precision farming helps in changing the financial status of ranchers.

Result

Traditional farming practices depend on the Indigenous information and experience created throughout the long term and have stayed famous even presently. Precision farming is a modern generation of cultivating that utilizes data innovation to assist farmers with getting the strength of their farms. With the assistance of remote-mounted or fixed sensors, alongside camera-prepared drones, farmers get ongoing information on crops.

Precision farming separates itself from conventional agriculture by its degree of the management. Rather than overseeing entire fields as a solitary unit, the management is modified for little regions inside fields.

In traditional farming, the idea is just to yield or reap. Interestingly, current agriculture as of now is seeking after benefit or loss. It has applied the possibility of the economy to produce an item,

it requires capital expenses with predictable benefits and dissects the plausibility of a business you run.

The traditional farming system focuses on the food needs of farmers, so it isn't reasonable to address the issues of a rising number of people. By and by, present day agriculture centers around endeavors to meet human food needs and species breeding agriculture, aiming to upgrade cultivating to produce quality food [1-12].

Conclusion and Recommendation

Precision agriculture has acquainted creative techniques to perform traditional farming, for example, irrigation, crop arranging, and replanting, recording farm information and direct soil tests. The significance of precision farming likewise increases with the approaching danger of food emergency and hunger with the rising tension on farmers to deliver better returns, an investment in precision farming would be a shrewd choice by farmers, as it would at last prompt increased benefits, a healthy environment, and the advancement of sustainable farming.

Notwithstanding, execution of precision farming remains a challenge because of significant expenses, absence of involvement and knowledge to use drones, robots, and other advances. The environment and economic advantages of precision farming are likewise known and further help use of recent technologies in the agrarian area. The fate of farming areas lies in embracing current innovations and as such precision agriculture.

The analysis of the interview data additionally recommended that many of the farmers are yet following the conventional strategies for cultivating and the greater part of them do not know about any most current trends in the PF. They manifested a great deal of interest in the idea of PF. Funds, environment, unpredictable monsoon, little plot, or area of land region is the greatest difficulties faced by the farmers. Government can plan awareness and execution strategies to advance and motivate farmers towards adoption of PF in various states. Nearby government bodies - Panchayat and cooperative societies can classify farmers as indicated by the awareness and adoption level and can make the innovators good examples and advertisers of new current cultivating advancements. The nearby decision-making bodies can have separate awareness camps as indicated by the levels and order of farmers.

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