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Review Article

Agriculture Insights for Improving the Soil Conservation through Optimizing of Water Storage and Advanced Agricultural Methods

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Abstract

Soil damage has been increased the in the few last decades due to human activities, urbanization and other erotic factors. Absorption of water through soil and aerial parts of plants and resource management strategies allow for the conservation of water. While, organic matter playing important role in good soil structure and water holding capacity, promotes water infiltration, and protects the soil from erosion and compaction. The best water conservation practices to be made in order to optimize the water usage as quantity of water reflected to the crops cultivations. Soil restoration increases the chances to minimize the risk of climatic conditions that ultimately helpful for making the soil fertility. In soil, water from different sources absorbed including the rain sources, surface water, ground water and external water sources. Agricultural groundwater sources are also maintained for irrigation and storage of water needed for survival of climatic conditions. Water storage through solar panels also another way for marinating the water balance and also helpful for storage system. Vertical flow CWs (VFs) are more efficient for marinating the water balance in the agricultural land as compared to the horizontal flow.

Keywords: Conservation of water, crops cultivations, water storage, Vertical flow CWs.

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INTRODUCTION

Agricultural land offers the production of fruits, vegetables, a variety of different crops, growing herbs, natural vegetation for the animals and other farm land. These agricultural products needed the appropriate amount of water for soil conservation. In this way, different nutrients also applied to the soil for increasing the soil fertility. The appropriate amount of fertilizers and water should be optimized as both necessary for increasing the soil yields, and characteristic features. The applied amount of water to the soil depends the three ways. Water conservation is important because fresh clean water is a limited resource, as well as a costly one. Low quantity of water leads to poor yield as it stunt the growth of tiny and young tissues that cannot survive and ultimately cause the poor yield. Low quantity of water leads to poor yield as it stunt the growth of tiny and young tissues that cannot survive and ultimately cause the poor yield. While on the other hand, high quantity of water leads to increase growth. In this way, optimum amount of water is necessary for plant growth and different crops [1-3].

Water is also essential for the irrigation purposes. Many of different methods adopted for usage of water to soil application. These are an on-farm water storage, water harvesting and small-storage technologies. An on-farm water storage is the ideal system that allows the store canal water, surface water runoff during the rainy season. This system is adequate and favorable as compared to the traditional methods. Water harvesting and small-storage technologies are convenient and reliable for rapid improvements in the yields of rain fed crops. The water can be absorbed to the plant surface in such as way that plants always take a lot of ground water thus ground water should be replenished. For crop irrigation, water efficiency should

be retained under optimizing conditions that means minimizing losses due to evaporation [4, 5].

Table-1: Shows the Agriculture insights for improving the soil conservation

Agricultural methods/Systems /Factors	Application	Usage	Effectiveness
on-farm water storage , water harvesting and small-storage technologies	optimizing conditions that means minimizing losses due to evaporation	Agricultural land	convenient and reliable
Climatic , evaporation	affected the growth of crops and other activities of soil matter. Soil conservation is the appropriate strategy for reducing the risks that can increased the soil damaging layers by availing the new opportunities	Agricultural land	Soil erosion is another problem
Water based systems	the rain sources, surface water, ground water and external water sources	Agricultural land	convenient and reliable

Absorption of water through soil and aerial parts of plants and resource management strategies allow for the conservation of water. The best water conservation practices to be made in order to optimize the water usage as quantity of water reflected to the crops cultivations. Different parameters are affected on water usage such as recharge capacity, composition of the geological substrata, rainfall patterns, evapotranspiration and runoff. High rain fall also decreases the significant yields as it reflected the leaching of essential minerals from plants that can cause the serious mineral deficiency. Transpiration also affected the overall growth on soil characteristics. High or low evaporation can cause disturbances of different mechanisms occurring in plants. Recharge capacity also affected the usage of water to new agricultural land as sometimes, due to low capacity of plant cells to store water that can cause serious water storage problems [6-9].

Role of Agriculture in Soil Conservation

Soil damage has been increased the in the few last decades due to human activities, urbanization and other erotic factors. There is need to conserve soil in order to protect it from further damaging. Agricultural practices are major playing contributors to maintain the soil composition from further degradation. Improving the soil composition increase the chances of circulation of organic and inorganic minerals that playing holding the significant role in marinating the soil matter. While, organic matter playing important role in good soil structure and water holding capacity, promotes water infiltration, and protects the soil from erosion and compaction. Soil conversation also playing role in low down the water from concentrating and moving down the slope in a narrow path an increased the entry of organic nutrients into the soil. Different organisms depend on soil and promote the soil activities for example, various bacteria helpful for maintaining the soil composition in adequate manner and prevent the soil degradation for soil conservation [7-9].

Exploring the Agricultural Practices for Soil Conservation

Climatic conditions affected the growth of crops and other activities of soil matter. Soil conservation is the appropriate strategy for reducing the risks that can increased the soil damaging layers by availing the new opportunities which may emerge from change in climate. The other pillar in the soil conservation is the restore soil structure to enhance its rate in different environmental conditions and physical factors that affected the soil balance. For example, drought, heat wave, and inundation and uncertain and variable climate. Soil restoration increases the chances to minimize the risk of climatic conditions that ultimately helpful for making the soil fertility. Soil erosion is another problem in the agricultural land that can be solved through soil conservation. Detection of soil erosion as a problem in the field helpful for cultivation, soil. This can affected the growing activities and is eroding more quickly than it is being formed, causing land to become unsuitable for agriculture Mechanical structures such as bunds or terraces may be developed in order to solve this problem [10-13].

Water Storage Systems

In soil, water from different sources absorbed including the rain sources, surface water, ground water and external water sources. Rain fall is also ideal source also it contains many of the minerals necessary to promote the growth promoting bacteria, other useful microbes that maintain the soil composition. Surface water sources including the water that pools on the surface of the earth in the form of dams, lakes, rivers and creeks. This type of water resources also effective for cultivation and promote the crops growth, but sometimes, excessive quantity of water to the soil leads to damage in such a way that layers of soil occurs that can disrupt the activities of soil microorganisms. Water based systems promote the overall irrigation options and capability also prevents them from entering into outside sources of freshwater. Sometimes, contaminated water can cause the stunt growth of crops that ultimately leads to poor yield and affected agricultural zones [14, 15].

Agricultural groundwater sources are also maintained for irrigation and storage of water needed for survival of climatic conditions. For example, underground water aquifers accessed for creating a hole down to the water table and then pumping it out as needed for irrigation storing in bore water tank. The other type of water based resources are external water sources effective for water that is piped for appropriate water supply. This type of water based system is also ideal for transportation purposes to the main agricultural land as water trucked in transport tanks to be stored. Water storage in tank allow the flow for agricultural land where excessive quantity of water can be under storage for short period of times. In that agricultural land, water is collected over time and stored in a water tank [16-19].

Water quantity depends on several factors that affected the soil composition. Low quantity of water is not favorable for the agricultural land as slow down the vegetation and other developmental sages. While on the other hand, excesses of water quantity is not favorable for the agricultural land as leaching out the essential mineral that disrupt the food chain. In this way, appropriate water storage systems are storage containers including rainwater tanks, storm water tanks, bore water tanks, stock water tanks and troughs. Waterways such as creeks on the property that can be pumped from and stored in water storage tanks [20, 21].

Tillage Based Strategies

Sod based rotation is another efficient method allows the appropriate flow of water to improve the soil quality and overall water-holding capacity. This type of system is also archive the benefits of soil conservation as majority of livestock depends on it. It also incorporates two or more consecutive seasons of a perennial grass into a conventional row-crop rotation while on the other hand, other traditional used methods are not reliable due to high cost and machinery for soil improving properties [21, 22].

Soil structure and water intake through appropriate ways are the directly related to the modify the plant root structure by mediating the water intake balance to improve the soil's capacity to hold water and reduce the soil temperature, thus reducing the amount of water lost to evaporation. In this way, total amount of lost water is gradually decreased due to water balancing system flooring to the main agriculture areas that also provides the variety of crops and minerals necessary for human health. The ridges based system also speed up the drainage problems and soil warm-up that allows the cultivation controls the weeds along with some herbicides for improving soil properties [23-25].

Water storage through solar panels also another way for marinating the water balance and also helpful for storage system. The main advantage of this method is that farmer could hold off watering when it's raining. A soil moisture sensor also integrated into the irrigation system aid in scheduling water supply and distribution much more efficiently. These advances lead eventually for soil modification through impure soil and clean it for marinating the soil conservation and thus wide range of applications [26-28].

Vertical flow CWs (VFs) are more efficient for marinating the water balance in the agricultural land as compared to the horizontal flow CWs (HFs). Vertical flow CWs also reclaimed the usage of water to be used in irrigation. A vertical flow constructed wetland (vertical flow CW) is also lower the salinity and improving the soil characteristics. While on the other hand, traditionally used water flow systems can cause serious noise pollution to the main agricultural land and ultimately affected the growing conditions of crops. Thus, application of water systems influenced the soil properties through irrigating soil, nourish the tiny roots that needed essential minerals [29, 30].

Recent Approaches

Nanoparticles are the ideal source of delivering of pesticides to the targeted crop in order to maintain the water balance, minerals flow and flow sap mechanism. Nanoparticles have small size, due to which, they become clogged more easily than HFs because of the use of substrates with smaller particle size. Naturally, water balance is usually disturbed by excessive loss of water or low rate of evaporation that can cause deleterious effects on soil conditions. It resulted in low yield of products from agricultural land. Many strategies have been applied for improved the quality of water to the agricultural land. These are soil moisture storage, groundwater storage, and surface storage. The risk of cause of salinity in agriculture land has been leads the soil conditions that altar severe the climate change. Appropriated water maintained systems are resolve the climate changes problems and also decrease the attacking capacity of microbes that can affect the soil breaking [31-33].

Gravel is also used in the agricultural land and for different purposes as it supports the attached-growth biomass and plants. These particles are small, irregular pieces of rock and stone. Another approach has been applied is the application of organic chemicals that enhanced the denitrification efficiency by removing the wastewater from the polluted soil. As environmental friendly needed for the agricultural to remove the wastewater and other contaminates that can cause the serious toxicities. An ideal water storage system can maintain the water and mineral balance due to the large applications of chemical pesticides for soil that leads the encounter the crops quality [33-36]. While on the other hand, agriculture wastes can cause deleterious effects to soils conditions while they can be used for environmental and economic advantages as compared with mineral substrates such as gravel.

CONCLUSION

Nanoparticles have ideal rate of delivery and efficiently remove the heavy toxic metals from the landfill leachates. Therefore, they can used for solving the problems associated with clogging which is a fatal threat for the subsurface. Nanotechnology also applied to the agricultural land for improving the water holding capacity, removal of contaminates, maintain the sustainable agriculture land to the for eco-friendly agriculture practices.

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