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Review on Agricultural Soil Quality

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Abstract: ***The objective if any agricultural research program is to increase the level of crop productivity. The strategy to boost the level of crop productivity would be through the adoption package of practices comprising use of seeds of high yielding varieties, adequate doses of manures and fertilizers and plant protection chemicals in the present study effects of for functionally different pesticides (a herbicide is isoproturon, a fungicide; captain and two insecticides; deltamethrin and pirimicarb) on sediment micro biota. The objective of the study is to examine if the pesticides concentration is negligible, maximal permissible concentration (MPC) and to study the effect of integrated nutrient supply on transformation of N.P and K into soil. The effect of agricultural planning has also resulted in a compare Active increase in crop production.***

Keywords: Agricultural, Fertilizers, Pesticides, Effects Soil

1. Introduction

Soil is a natural surface layer that is capable of supporting plants. Soils forms the uppermost layer of the earth's crust and is made up of inorganic matter it is truly said that soil and water are the two significant capitals of mankind and the natural forest are the mother of rivers and he factories for manufacturing soil the provides the homes and idea environmental condition for living being.[1]

The soil is not a mass of dead and debris, .merely resulting from the physical, chemical and biological weathering of rocks it is a more or less homogeneous system which has resulted from the decomposition of plant remains. soil is used to grow most of the Wolds food and much of its fibre[2] the world mushroom human population imposes increasing and increasing pressure on farmer to produce more food each year the pollution in the form of chemical and west product affect All form of soil organism ranging from protozoan to small mammals (Banerjee et al 2008)

The upper soil contains high organic matter, which is presence of adequate moisture supply, acted upon by the microorganisms to decompose the complex organic material into simpler forms [32]

Many of the chemicals used in soil co tenants whose impact may injure for DECADES adversely affect pesticides are resistant soil conservation (US environmental protection agency 2007. [3]

Soil is a dynamic living system with a variety of micro and macro flora and fauna including bacteria actinomycetes fungi nematodes arthropods crustaceans and earthworms. They play a primary role in the degradation of plant and the release of nutrients from soil minerals to sustain plant and animal production, it's important to maintain water and air quality, and support human health and environment [35]

Anything that affects their activities might affect the function of soils. And also on crop production in the carbon and nitrogen cycles and in the removal of a range of environmental pollutants.[4]

The term pesticide covers a wide range of compounds including insecticides, molluscicides, herbicides, rodenticides, fungicides, nematicides plant growth regulators. Chemicals which used destroy any pests is pesticides"[33] and others among the insecticide which is organochlorine (OC) used successfully in controlling a number of diseases such as malaria and typhus were banned or restricted. In most of the technologically advanced countries the introduction of other synthetic insecticides organophosphate insecticides in the 1960s carbamates in 1970s-1980s contributed greatly in pest control and agricultural output. Ideally a pesticide must be lethal to the targeted pests but not to target species including man unfortunately, this is not so the controversy of use and abuse of pesticides has surfaced. The rampant use of these chemical, under the adage "if little is good a lot more will be better" has played have with human and other life forms.[5]

Fertilizers are plant nutrients and trace element applied generally to the soil to promote the growth of crops. A list of these chemicals, also known as "artificial manure" [6]

N-fixing bacteria, algae and earthworms play main role in maintain the soil fertility quality. [31] Also for In order to grow crops, soil can be holding water and nutrients like a sponge which is available for plant roots[34]

Soil micro and micro arthropods exert significant control over litter decomposition and nutrient release and contribute directly to humus fraction and also polish the soil. [7] Same Micronutrient plays a vital role in maintaining soil health and production of crops. [29]

Agrochemicals are used world –wide to improve or protect crops and. Fertilizers are applied to obtain good production from crops that are protected from insects and disease by veterinary treatment such as vaccination, oral dosing or immersion dipping. The word should be interested in its widest use by any person, whether worker or family, and should also include any associated activity such as handing storage, transport, spillage and disposal. The preservation of soil fertility its depends on the activity of the soil microbial biomass [37]

The crop production technology can be use high inputs of agrochemicals are not necessarily undesirable, especially as crop intensification produces increasing production on small land. the enhanced use of pesticides that might alter the

micro flora responsible for the maintenance of soil fertility and also lead to reduced pesticide efficiency because of shifts in microbial population toward organisms more efficient in pesticide degradation. Green revolution in India was ushered with the increased input use of pesticides in agricultural fertilizers and using develops technology. Only for increase the food production, many of agriculture farmers are not aware of the environmental pollution occurred due to usage of pesticides [8]

Judicious use of organic manures such as FYM and farm along with chemical fertilizer improves soil physical, chemical and biological properties and improves crops production system besides improving the productivity. Long –term fertilizer experiments provide valuable information on impact of continuous use of fertilizers with become good platform for monitoring the changes in soil fertility and productivity. [9]
Current soil quality research has several motivations. The most important is by improving environmental quality and productivity by better site specific management decisions. A less common motivation is to develop the value of soil as a natural resource at the national and regional scale.

Most researchers try to reconcile the goals of farmers with the desires of future generation and with the offsite environmental goal of individuals and society because site specific

Assessment is important of this work is relationship between researchers and farmers. And it is very critical component for study of soil quality {10}

Nitrogen, phosphorus and potassium these elements are present in soil at different forms

A large amount of nitrogen occurs in organic form, while that of phosphorus is in inorganic form. While the most important for of potassium are water soluble and exchangeable. Potassium which contributes to available potassium[17] the distribution of the forms in soils is important to understanding the conditions and their availability to growing crops and interconversion of one type to another under specific soil conditions which determines their availability to plants (khan et al. 1993). Not only the status but the different pools, the nutrients occur in soil and play an important role in their uptake, and crop growth. The nonstop addition of organic manures with chemical fertilizers may stimulate immobilization and mineralization of plant nutrients, thereby affecting their amounts in different organic and inorganic forms in soil. So it leaves fabulous scope to create relationship between different nutrient fractions in managing on dynamics of nitrogen, phosphorus and potassium in crop has been planned.

(i) To study the effect of constant use of chemical fertilizers and amendments in nitrogen, phosphorus and potassium dynamics.
(ii) To work out relationship of different forms of N, P and K, with yield and nutrient uptake
(iii) To work out relationship of different forms of N, P and K, with different soil

Interpenetrating polymer network has been synthesized through enzymatic initiation using lipase as originator, through soil and composting methods. [11]

The presence of pesticide residues in soil and water is a serious problem in India. For that most of the pesticides have been banned, as they have a highly harmful on plants and environments.
Persistence potential in soil and water but due to ignorance and the lack of awareness towards pesticide usage and their implications they ate still under use.[18] During this study.

We have looked at Adrin, dieldrin and isomers of HCH and the entire de pesticides figures in as substance scheduled for elimination from usage (jones and voogt, 1999). Any attempts to eliminate these pesticides from the environments require strict control at the level of manufacturing and availability the scientific aspect linked with the pesticide movement within the. The best substitute to agrochemicals is biofertilizers. It is understand the helpful role played by biofertilizer in crop production and the soil fertility. Thus, the compares the effect of agrochemicals [fertilizers (urea), fungicide (carbendazim) and insecticide [12]

Contamination of soil by Pesticides have various type that determine how they work once in soil Mobility refer to how much a pesticide will move around in the soil the time span by life of a pesticide refers to the length of time it take for part of the pesticide to degrade. Persistence refers to the length of time until all considerable residues of a pesticide are gone. The degradation of some pesticides is affected by soil pH.[30] Herbicide applied on soil at extreme level have negative effect on ground water contamination and it leached and washed by rain.[36] Effect on soil for two out one spoon of healthy soil contain millions of small organisms as well as fungi, bacteria, and a host of others, the microorganisms play role in helping plants use soil nutrients needed to grow and thrive microorganisms also help soil store water and nutrients control water flow, and filter pollutants. The heavy treatment of soil with pesticides can cause populations of beneficial soil microorganisd, s to decline. Sometimes pesticides have a negative impact in vermicompost treated soil and high seed germination % observed in bio fertilizer treated soil. As compare to chemical fertilizer. {19}

On the available NPK from soil accounting to soil scientist Dr. Elaine Ingham “If we lose bacteria and fungi, then the soil degrades. Overuses of chemical fertilizers and Pesticides have affected on the soil organisms that are like to human overdo of antibiotics. Random use of chemicals might work for a few years. But after awhile, there aren’t enough beneficial soil organisms to hold onto the nutrients.

Contamination of Air, soil and Non-target vegetation by pesticide sprays directly affect non-target vegetation, can drift from the treated area and pollute air, soil, and non-target plants, some pesticide drift occurs during every use, even from ground equipment,[41] Drift can account for a loss of 2 to 20% of the chemical being apply, which can spread all over a distance of a few yards 100 miles, There are many reported complaints of goal spray drift each year in the U.S.many pesticides can volatilize that is, they can

evaporate from soil and plant life move away from the application, and pollute the environment. As much as 80-90percernt of an applied pesticide can be volatilized within a few days of application despite, only limited research has been done on the topic, studies constantly find pesticide residues in air .According to type USGS, pesticide examine has been detected in rain, air, fog, or snow across the nation at different times sampled nationwide. Wide application of agrochemicals, in particular pesticides, on a multiplicity of microorganisms incorporated in successive food chains in the soil food web. {14}

2. Soil Characteristics

The nature and composition of the soil sample from the experimental field a depth of 20 cm, representing the soil of the experimental field were collected randomly at five place of field. These samples were mixed together and a composite soil sample was drawn for mechanical and chemical analysis and physical contents as like field capacity permanent wilting point and bulk density of the experimental field capacity permanent wilting point and bulk density of the experimental field. The composite soil sample of experimental field was than analysed for various physic chemical characters.

25 million agriculture workers have suffered from non-intentional intoxications every year (Alavanja, 2008). [38] causes of fertilizers and pesticide direct or short term impact or indirect due to changes caused by chemical [The widely acceptable definition of soil quality was described by Doran (2000) which explained that soil quality is the capacity and ability of the soil at particular area to contribute and function within system cultivated soil with regards to sustainability in biological productivity environment quality, flora and fauna conservation. Hence the use of soil indices for evaluating soil quality flora and fertility at percolate agricultural land is best to be taken as rational rather than absolute. It means that the usage of soil indices for would be able to give an earlier indication and information on the present status of soil condition. Therefore it assume to be helpful in addressing the condition of the soil of agricultural land by investigative a number of selected soil properties through soil quality assessment. Moreover, land farmer and stake-holder can be informed and recommended with a better approach in their land usage management in order to maintain the soil productivity. The Long-Term Fertilizer Experiments are invaluable for the study of yield, changes in nutrient dynamics and balances, predict soil holding capacity, assessing soil quality and system sustainability and risk management In India,[20] the Long-Term Fertilizer Experiments were established in of the last century. Since then, these experiments are assessed periodically for the changes of soil fertility or biochemical parameters in recent year, trend of soil fertility changes in many of the long – term studies in India have been reported from samples obtained after the crop harvest to growing Next crop. in difference, information on the changes in soil quality due to long term use of chemical fertilizers and soil amendments is limited therefore, the study of "Soil quality indexing of an acid al soil under maize-wheat cropping system ads influenced by continuous use of chemical fertilizers and soil amendments"

Agrochemicals are linked to the ferrocenyl system directly (for example, herbicides and fungicides) or indirectly, as catalysts synthesis of organic compounds importance for agriculture13]

To study the effect of long-term use of chemical fertilizers impact on physical, chemical and biological attributes of soil. To develop soil quality index with special reference to crop yield sustainability. [21] Macro invertebrates, sediment microbes and toxic compounds interact in a highly complex. Some bio-magnifications pesticides are hazardous for in plant and animal tissues (particularly in lipid bodies) and health and may lead to several ailments. Over the decades, it has been increase in pesticide use increases in the problem of bio-magnifications. [15] Soil quality indexing of an acid al soil under maize-wheat cropping system as influenced by continuous use of chemical fertilizers and soil amendments The indiscriminate use of fertilizers and disproportionate rate of essential nutrient elements use over a period of time has resulted in build-up of nutrient elements like phosphorus and deficiency of nitrogen [28] India s first report of poisoning due to pesticides Was from Kerala in 1958, where 100 people died after consuming wheat flour infected with parathion[16]

Agriculture production system involving tillage, residue and crop management practices directly and indirectly have an effect on soil environmental factor that control the growth and activity of plants and microorganisms. Running practices, which pressure the placement and integration of plant and animal residues, also control the accessibility of these substrates to soil micro flora and fauna.[22] Insecticide residues usually occur in the top 15 cm layer of soil. [23] Agricultural chemicals such as pesticides and herbicides may be taken into the human body by mouth, through the skin, or through the lungs, the uptake of chemical poison through mouth is minimal during pesticide application unless operators unwisely eat, drink or smoke before washing hands and face. [24]

World health organization estimated that at least 3 million cases of acute poisoning and 20,000 death occurs annually due to exposure to pesticide (Orhii 2010).[36] The soil is the main matrix for pesticide disposition[39]

Bio fertilizers have been well accepted as economical, cost efficient, renewable and safe organic resource of plant nutrients to sustain crop yield. [25] The various soil properties are used for evaluation of soil for different crops. The value of soil resource inventory for increased food production. [26] The continuous of potassium fertilization may result in the depletion of potassium status of soil effect on plant growth. [27]

3. Conclusion

Long-term usage of chemical fertilizers and the pesticides has resulted in the immense decrease of a fertility of soil, which affected Badly on the crop production, THE continuous use of such fertilizer may change a fertile land in barren, Excessive use of an pesticides are not just getting lethal for an targeted pests but also for an targeted- species including man The heavy treatment soil with an pesticides

can be responsible for the death of Beneficial microorganisms present in the soil which leads to an decrease of fertility of the soil and the crop production.

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