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Effect of various contaminants on soil productivity and quality

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Abstract
Consumer Society with growing food demand with limited land area there is a need to achieve maximum efficiency and high production with good quality products. It is known that the plant nutrients are one the most important factors for maintaining agricultural productivity and quality. But now a days soil are running out of nutrients are poor or inefficient. Such an effect is due to over use of chemical fertilizers, chemical pesticides in soil that has a negative impact on public land as well as natural health. Heavy metal is among the most important pollutants present in the soil. This paper aims to integrate information about soil pollution by heavy metals as well other pollutants such as dust, oil, and their sources and effects on soil. Heavy metals such as As, Pb, Hg can reduce productivity rates of soil.Soil also shows less fertility and less productivity. All such pollutants have adverse effects on the soil quality and productivity and human health. The rate of fertilizer application and the continuous industrial out flow of waste water on the ground causes nutrient imbalance as well as polluting the soil on ground water resources.

Keywords: Chemical pesticides, fertilizer, impurities, heavy metals, production

Introduction
Fertilization increases the quality and productivity of the soil. There are two types of Fertilizers, organic and Inorganic fertilizers. These mainly contain phosphate, nitrate, ammonium and potassium salts. Heavy metals such as, Pb, Cu, Ni and natural radioactive materials such as 238U, 210P, 232Th [1-2]. But its use has grown rapidly in recent years around the world causing environmental problems. It is responsible for the accumulation of heavy metals in the soil and the plant system. The plant absorbs manure from the soil and enters the feed canal. It therefore causes human health problems and soil pollution. Heavy metals and radio components are pollutants that can accumulate in the soil. Human activities have the potential to produce soil pollution and thus affecting the soil ecosystem. Oil production in other countries such as Nigeria is one of the major concern for soil quality. As Nigerian economy depends on the refining of petroleum products. They benefit from it but directly or indirectly give a negative effect on the ground. Acidification of the soil is the most dangerous problem, sometimes the source is acid rain. Strong acidification slows down fertility and production [7].

Effects of chemical fertilizers on soil productivity
Soil is one of the most important living resources. We rely on the soil for food. But now the days the soil start losing its fertility due to the overuse of chemical fertilizers. After continue use of fertilizer soil fertility starts deteriorating. Toxic substances of fertilizers accumulate on vegetables and cause adverse effects on humans and animals body. In particular NaNO3, NH4NO3, KCl, K2SO4, NH4Cl from fertilizers breaks soil formation as well, it causes deterioration and makes it difficult for soil to attain its fertility again. High levels of sodium and potassium content has a negative effect on soil. Continued and excessive use of fertilizers and formation of nitrogen fertilizer causes increase in soil acidity which leads to low productivity. Potassium-containing fertilizer is also disturbs nutrient balance in the soil and cause less fertility. And shows a negative impact on earthworms which may cause death also [8]. Nitrogen is one of the most important nutrients in soil that needed by plant for growth. A large part of chlorophyll absorb light energy and provide green colour to plant. It gives the proper growth and development to the plant. Sometimes excess use of fertilizers causes burning of leaf tissue and plant death. And with that reduction yield means less productivity [9]. 28% to 48% of the nitrogen fertilizers residue remains in the soil [9].

About 28% of the nitrogen from urea remains in the soil. 19% to 23.5% anhydrous ammonia used for maize crop left in the soil as a residue [11]. Such residual nitrogen in the soil reduces productivity continuously. Excessive use of phosphate containing fertilizers increases the acidity of the soil and cause reduction in yield.

Effects of heavy metals on quality of soil

Industrial waste cause increase the concentration of heavy metals and overuse of chemical pesticides, such as Arsenic (As), Mercury (Hg), Lead (Pb), Cadmium (Cd), Chromium (Cr), and Zinc (Zn) which is toxic for soil and cause less fertility. Metals have a adverse effect on soil because it does not enter into biodegradation process and that is why its remains in the soil and easily accessible to man through food chain.. Arsenic (As) shows a carcinogenic effect on a person health. Soil can be contaminated with lead (Pb) also from different sources such as industrial wastewater, lead gasoline, and old lead pipes. Salt accumulation also cause less productivity and fertility of soil because salt ions does show any movement in the soil. Metals have very dangerous effects on body which cause brain damage and cancer like diseases. Mercury (Hg) Soil Contamination by different Sources such as industrial wastewater, painting and fertilizer as well fungicidal spray also have adverse effect on human health.

Effect of acid rain on soil productivity

Acid rain is the result of air pollution. The wind pollutants such as sulfur dioxide SO2 and Nitrogen oxides available in the air through sources such as automobile exhaust, industrial waste that produces toxic rainwater. Acid rain causes acidification of the soil and reduces such nutrients Potassium (K), Calcium (Ca), and magnesium (Mg) from soil by ion exchange method. Loss of nutrition means loss of soil fertility and production [14]. Acid rain also causes damage to the leaves of the plants or yield and as a result the yield decreases.

Effect of dust on vegetation

Dust is one of the pollutants that restores yields. Dust can be carried by air. Sources of dust Mineral extraction, Construction work that includes cement and much more. Dust gets settled on plants and clogs pores and thus prevent stomata operations. It slows down plant growth. The physical and chemical effects of dust on both plant and soil is responsible for low yields [15].

Effect of oil spillage or crude oil on soil

Soil physical properties: The presence of oil content in the soil decreases the Saturated Hydraulic Conductivity (Ks) and Water Retention. This is because the oil blocks the hole in the ground. porosity are affected here and reduced to some extent and resulted in poor growth and low crop yields [17]. Macro porosity also decreased due to oil dirt on the ground. It leads to a lack of air and water flow on the ground. And ultimately reduced interest rates and productivity soil [17].

Conclusion

Today the need for food is increasing because of population growth. To meet the needs of all people we are trying to increase soil productivity. We are such people using chemical fertilizers, chemical pesticides at a high cost. But its excessive quantity reduces quality and productivity of soil. It means it gives a negative effect to the ground. Use of pesticides and the passage of industrial pollutants into the soil are adding up heavy metals in it. Heavy metals from the ground reaches to plants and after harvesting it finally reached man through food chain. It causes a negative impact on human health which causes diseases such as, brain damage, paralysis, cancer. Oil-soaked soil reduces water retention capacity, saturated hydraulic conductivity, porosity and macro porosity decreases due to oil contamination and consequently reduces fertility and ultimately the production of soil as a result lack of air and groundwater flow. The effect of dust on plants are that they prevent stomata and slows plant growth. So you need to pay attention to it sources and effects of different pollutants or pollutants in soil. We have to control such activities in order to continue soil fertility and fertility.

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