

EFFECT OF TEMPERATURE ON SOIL ENZYME UREASE ACTIVITY-PRODUCTIVITY

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ABSTRACT

Soil enzymes play a major role in the mineralization of nitrogen, phosphorus and sulphur. Mineralization is the process of transformation of organically bound elements into mineral from which will readily take up by plants and is crucial to plant nutrition and indirectly plays a role agriculture productivity. The abiotic enzymes present in the soil play an important role in catalyzing several important reactions necessary for the life processes of microorganisms in soils and their by stabilizing soil structure, the decomposition of organic wastes, organic matter formation and nutrient cycling. When the temperatures are increasing due various changes caused by global warming and other aspects they have a profound influence on soil enzymes and indirectly on agricultural productivity. Every enzyme has its own optimum temperature below the optimum temperature the enzyme activity is less due to inactivation and above the optimum temperature the enzyme activity decreases due to denaturation. Due to increase in temperature the enzymes are denatured and nutrient availability is decreasing and indirectly effecting productivity. To study the effect of temperature on soil enzyme activity four different soil samples were collected and incubation studies were carried out at different temperatures ranging from 20 °C to 70 °C with two Alfisols and two vertices. Ureas enzymes have shown to posses highest activity at 70°C, which converts Urea present in the soil to ammoniacal nitrogen readily accepted by plants and which indirectly plays a role in productivity is greatly influenced by climate change IE: - temperature. The enzyme activity at different temperatures is as follows where the activity is measured as μg of NH_4^+ released g^{-1} soil h^{-1} , at 20°C 0.9, at 30°C 2.16, at 40 °C 5.61, at 50°C 14.63, at 60°C 26.32, at 70°C 52.67, at 80°C 23.21 and at 90°C 15.45.

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