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Impact of Fly Ash on Soil Quality in Semi-Arid Region

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Abstract : Soil is a natural material with a distinctive form. It is regarded to be a natural source of nutrients and minerals for plants. It meets many of our needs through the crops, trees, and inhabited places that have grown on or underneath it. Productive and rich soil plays a crucial role in both its wealth and well-being. If any external substance changes the soil's composition, it directly impacts the plant that was grown in that soil. If the soil is deficient in one or more essential components, fly ash can be utilized as fertilizer by incorporating it into the soil. This can also increase the porosity of the soil. Fly ash has a sufficient concentration of essential components to promote the growth of plants. The high concentration of elements in fly ash, including C, Na, K, Fe, and Zn, increases crop yields. Hazardous compounds harm plant life as soon as they get into the soil. The US Environmental Protection Agency and other regulatory agencies have found it as non-hazardous. By employing fly ash as a potential fertilizer supplement for degraded soils, the problem of disposing of solid waste can be partially handled. Fly ash's rapid growth can slow down mineralization because it contains a higher proportion of harmful heavy metals. The chemical characteristics, inclusion ratio, and composting process of fly ash have a significant impact on the fly ash compost’s potential to improve soil nutrition. Research institutions and regulatory agencies have been thoroughly investigating fly ash for a long time. Guard cells on plant leaves that accumulate fly ash trigger the regulatory system. Fly ash increases both chemical and physical damage at certain humidity levels. The lengthy sowing period is caused by the high levels of fly ash in the soil, which also slows down seedling germination and growth. For the sake of human health, it is crucial to consider the bioaccumulation of dangerous heavy metals and their necessary concentrations in plant tissues and soil.

Keywords : soil, fly ash, plant, fertilizer, composts
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