

# **IMPACT OF DIFFERENT INORGANIC PHOSPHORUS (P) FERTILIZER RATES ON SOIL P POOLS**

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## **ABSTRACT**

Phosphorus runoff from agricultural fields is one of the contributors to the contamination and degradation of various aquatic ecosystems. Data from Ohio fertilizer trials show applying phosphorus (P) leads to an accumulation of P in the available pool, but the crop yield response remains unaffected. A better understanding of other P pools would be beneficial for comprehending the yield responses. This study aims to determine the impact of different inorganic P fertilizer rates on soil P pools. This study includes three different sites in Ohio: northwest, western, and north-central Ohio. Each location has three fertilizer treatments: control (0x), maintenance approach (1x), and buildup approach (2-3x) within corn-soybean crop rotation. These sites have received fertilizer applications since 2006 and have been in the drawdown phase (no fertilizer application) since 2021. The soil samples were collected from 0-8 inches in the summer of 2024 from the soybean phase. Samples were analyzed for the P saturation index and different P pools. The preliminary data shows that P saturation levels were highest in buildup rate (9.12%) followed by maintenance approach (7.09%) and control (5.67%) treatments across sites. The relationships between P saturation and water-extractable P (P-solubility) will be examined to illustrate how soil P solubility changes as soil P saturation increases. The results of this study will highlight the impact of fertilizer rates on soil P pools and their effect on crop production and water quality.