Agronomic Evaluation of Iron Phosphate Compounds in Single and Triple Superphosphates to Upland and Flooded Rice. (S04-prochnow134117-Oral)

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Abstract:

A study was conducted to gain information on P availability of single and triple superphosphates (SSP and TSP) containing Fe-P impurity compounds when applied to soil under reduced and aerated conditions. Two impurity compounds, Fe3KH8(PO4)6.6H2O or H8-syn and Fe3KH14(PO4)8.4H2O or H14-syn, were synthesized under laboratory conditions and mixed and granulated by compaction process with monocalcium phosphate (MCP) at 25%, 50% and 75% of total P as MCP. Rates of P varying from 0 to 80 mg P kg-1 were used in the study. The results showed that H14-syn was more effective than H8-syn for both upland and flooded rice. Both Fe-K-P compounds were more effective when applied to the soil under flooded than aerated conditions. To reach 90% of maximum dry-matter yield of upland rice obtained with MCP, it required approximately 43% and 35% of total P as water-soluble P in the mixtures of H8-syn and H14-syn with MCP, respectively. The corresponding values for flooded rice were 17% and 11%. The results suggest that there is no scientific reason to impose legislation that requires water solubility as high as 90% in acidulated P fertilizers for agronomic use.

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