

## **Soil phosphorus levels can concentrate near soil surface**

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BOZEMAN -- Available phosphorus levels are somewhat more stratified in no-till than tilled systems, according to Montana State University researchers.

"The increasing adoption and use of no-till dryland cropping systems in Montana has resulted in different patterns of soil phosphorus distribution compared to conventional till systems," said Clain Jones, Extension soil fertility specialist in the Department of Land Resources and Environmental Sciences.

In a study conducted on clay loam soil at the Central Agricultural Research Center near Moccasin, Chengci Chen and Jones found that available phosphorus was most concentrated near the depth that phosphorus was applied in all tillage systems. However, the degree of phosphorus stratification was more pronounced in long-term no-till systems. Consequently, phosphorus uptake and fertilizer needs may be different between no-till and conventional till systems.

According to this study, however, above-ground phosphorus uptake by winter wheat was not significantly different between tillage treatments at optimum nitrogen levels. Therefore, phosphorus rates likely do not need to be adjusted between tillage systems, yet phosphorus placement is likely more important in reduced till systems.

"Broadcast phosphorus is more prone to losses from wind and water erosion, and is less likely to be taken up by the crop if not tilled in," Jones said. Unlike nitrogen, phosphorus binds tightly to the soil and will not move very far from where it is placed. "Therefore, phosphorus fertilizer should be placed with the seed, or a couple inches below the seed, especially in reduced till systems."

For copies of the Fertilizer Fact Sheet, please refer to the Web at <http://landresources.montana.edu/fertilizerfacts> (#47). Contact your local MSU Extension agent (<http://extn.msu.montana.edu/localoffices.asp>) or crop adviser for help with specific fertilizer decisions.