

Bringing K Back into the Conversation

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Throughout North Dakota, soil test K levels are declining and the incidences of K deficiencies are increasing. Coupling a history of limited K application and modern crop rotations removing more K than in the past, current farmers and consultants will need pay close attention to soil K levels and consider application of K fertilizer or manure to increase soil test K to critical levels.

Points to Remember

- Soil tests report the parts per million (ppm) of plant-available K^+ , while fertilizer is measured in pounds of K_2O ($K = K_2O \times 0.83$). The change in soil K levels with fertilizer additions or crop removal is around 8-10 lb K_2O /ac to change soil test K 1 ppm, this range exists partly due to fixation of K^+ in clay minerals.
- Soil test K levels may vary greatly throughout a field, making zone sampling and variable rate applications a very practical and economical management strategy.
- Plant available K varies depending on soil moisture content and generally increases during freeze-thaw cycles, making consistent timing of sample collection very important.
- In North Dakota, K recommendations are related to clay mineralogy; where smectic clays are present, a higher critical soil test K level is necessary. A map showing areas of the state with the higher critical soil K levels can be found in many of the NDSU-Extension soil fertility circulars.
- When applying K fertilizer, potash (0-0-60) is the most common and economical formulation. However, the high salt index of potash may lead to seedling damage if high rates are applied with the seed or broadcast rates greater than 200 lb/ac are applied in one year.
- In fields with sandy soil textures and low organic matter, K is susceptible to leaching. Care should be taken in leaching prone fields to only apply enough K to support crop productivity as soil test levels will likely not build even with high application rates.

Updated Recommendations and Circulars

To ensure the most recent data is used in creating fertility recommendations and managing soil, Extension circulars are reviewed and updated every few years. When updated, the published recommendations sometimes contain major changes. Please read new editions closely and familiarize yourself with the new recommendations.



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