Important Factors of Winter Wheat Yield Prediction in Oklahoma

Vegetation condition, moisture, and temperature are three commonly considered variables in crop yield prediction. However, few studies have incorporated all the three factors in winter wheat yield prediction in Oklahoma.

In a recent issue of Agronomy Journal, researchers developed an empirical model for winter yield prediction over 14 major winter wheat-producing counties in Oklahoma. The winter wheat phenology in Oklahoma was carefully examined, and different moisture indicators, such as precipitation and soil moisture, were evaluated along with the indicators for vegetation condition and air temperature in wheat yield prediction.

The vegetation indicator had the strongest correlation with yield variation followed by the moisture and temperature indicators. The best yield prediction in Oklahoma with a month before harvest was given by the model composed by vegetation indicator at wheat jointing and anthesis stages (March and April), one moisture indicator at emergence period (October and November), and one temperature indicator at emergence, jointing, and anthesis stages (October, March, and April).

The methods used in this study can be applied to identify the most significant variables and growth stages for winter wheat yield prediction in other regions. The empirical model may provide a valuable approach for operational winter yield prediction at the county scale.


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Dry Period Duration Affects Soil Phosphorus Solubilization

Climate projections for the future indicate that the United Kingdom will experience longer dry periods followed by rapid re-wetting, resulting in changes to phosphorus mobilization patterns. This will influence the transfer of phosphorus from land to water and its associated risks to water quality.

In an article recently published in the Journal of Environmental Quality, researchers use the UK Climate Projections to inform a simple laboratory experiment using three soils from contrasting UK catchments to test the hypothesis that changes in future patterns of drying and re-wetting will affect the amount of soluble reactive phosphorus (SRP) solubilized from soil.

They found that under climate change, the duration and frequency of dry periods will increase compared with present day conditions. For three soils, critical breakpoints (6.9 to 14.5 days) of drying duration were identified; before the breakpoint, an increase in SRP loss with the number of dry days was observed; after this point, the amount of SRP lost was reduced or stayed fairly constant. Therefore, the solubilization of SRP from soil will change.

The translation of these laboratory results to field scale should be treated cautiously. Yet the identification of a breakpoint in SRP solubilization from soil is novel and important.


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