Release of Modern Sunflower Soil Fertility Recommendations

The Situation
North Dakota is the second largest producer of sunflower in the USA. Together with South Dakota, the region produces most of the oil-seed and confection sunflower for domestic use and export markets. Previous soil fertility recommendations were over 40 years old. An updated research and extension approach was due.

Extension Response
With the support of the National Sunflower Association, nitrogen (N) and phosphorus (P) rate studies were conducted across the length and breadth of North Dakota over two growing seasons, with a total of 30 sites. The results from the study were analyzed and recommendations were revised based on the scientific data. The N and P recommendations were completely transformed from those previously published.

Impacts
Nitrogen recommendations are now regionally and tillage based. Regions are west-river and east of the Missouri river. Long-term no-till sites require less N than conventional till, a condition previously seen in wheat and corn, due to increased efficiency of N use under long-term no-till. N recommendations are yield response-based and economics-based, where oil content is also included for oil-seed. Confection and oil-seed sunflower N recommendations are different. There is no fertilizer P recommended since only 1 of 30 sites recorded an increase in yield due to P application. A nitrogen-rate calculator has been published on the web, and a nitrogen-rate calculator app for Android phones is also available for use.

Feedback
The National Sunflower Association is very pleased with the modern recommendations, and the new recommendations, which generally result in lower fertilizer inputs compared to the previous recommendations, also contribute to increased profitability of sunflower production and lower environmental exposure to N and P contamination of ground and/or surface waters.

Public Value Statement
The new recommendations provide a foundation for more holistic sunflower nutrient management. The discontinuation of P application to sunflower will result in a grower savings of about $18 M in costs to produce the North Dakota crop. The recommendations also consider the risk of sunflower wind-lodging, which if growers follow the recommendations, will reduce the annual loss to downed sunflower through poor harvest recovery and increased head diseases.

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