

Meta-Analysis of Phosphorus Fertilizer Placement and Tillage Interaction for Corn and Soybean in the U.S.

Synthesize currently available research to examine the effects of the phosphorus fertilizer placement and tillage interaction for corn and soybeans in the United States

Dr. Dorivar Ruiz Diaz, Department of Agronomy, Kansas State University

Project dates: Spring 2014 – Winter 2017

Project number: 4RM-09

Collaborators: Cristie Edwards, graduate student, Kansas State University. Dave Mengel, emeritus professor, Kansas State University. Ashley Lorence, graduate student, Kansas State University



Research Fund

PROJECT GOALS

RATE Crop yield and P losses in relation to application rates

PLACE Crop yield and P losses in relation to application placement and tillage practices

PROJECT RESULTS

Applying P fertilizer based on crop needs reduces the risk for P loss. When crop deficiency is suspected, band placement increases crop performance and decreases P losses.

RATE With high application rates (>40 lbs/acre), band and broadcast generally show similar yields. with low application rates band p

PLACE Higher yields when broadcast P fertilizer was incorporated with tillage compared to surface applied. With high P testing soils requirements can be supplied with band placement, with low P testing soils broadcast application may be beneficial.

WHAT DO WE DO NEXT?

- Need research studies to more directly reflect current on-farm practices
- Standardization of results reporting
- Need research into the long-term effects of changes in nutrient management practices



@SoilFertilityKS | ruizdiaz@ksu.edu

MEET DORIVAR

"My research and extension program in soil fertility looks to improve nutrient management at the farm level with emphasis on the interaction of nutrient management with other production practices. The 4R concept for nutrient management provides a holistic approach and considers the multiple factors and interactions taking place in the farm."

Dorivar's interest in agronomy, particularly soils and nutrient management, started very early while growing up in a farm. During his career, he has had the opportunity to work with producers working on small and large scale production systems. He believes the main challenges of profitable and environmentally responsible production largely remain the same. He also believes that soil fertility and nutrient management have a direct effect on agronomic, economic, and environmental aspects of production agriculture.

PUBLISHED REPORTS

Experiences in Looking at Phosphorus Management Data for Meta-Analysis, Challenges and Data Gaps. Dorivar Ruiz Diaz and Cristie Edwards. Great Plains Soil Fertility Conference 2016. Vol. 16. Denver, CO

THE 4R PRINCIPLES



RIGHT SOURCE
Matches fertilizer type to crop needs



RIGHT RATE
Matches amount of fertilizer to crop needs



RIGHT TIME
Make nutrients available when crops need them.



RIGHT PLACE
Place Keeps nutrients where crops can use them.

PROJECT GOALS / RESULTS KEY:

- RIGHT SOURCE
- RIGHT RATE
- RIGHT TIME
- RIGHT PLACE
- 4R GENERAL / OVERALL