

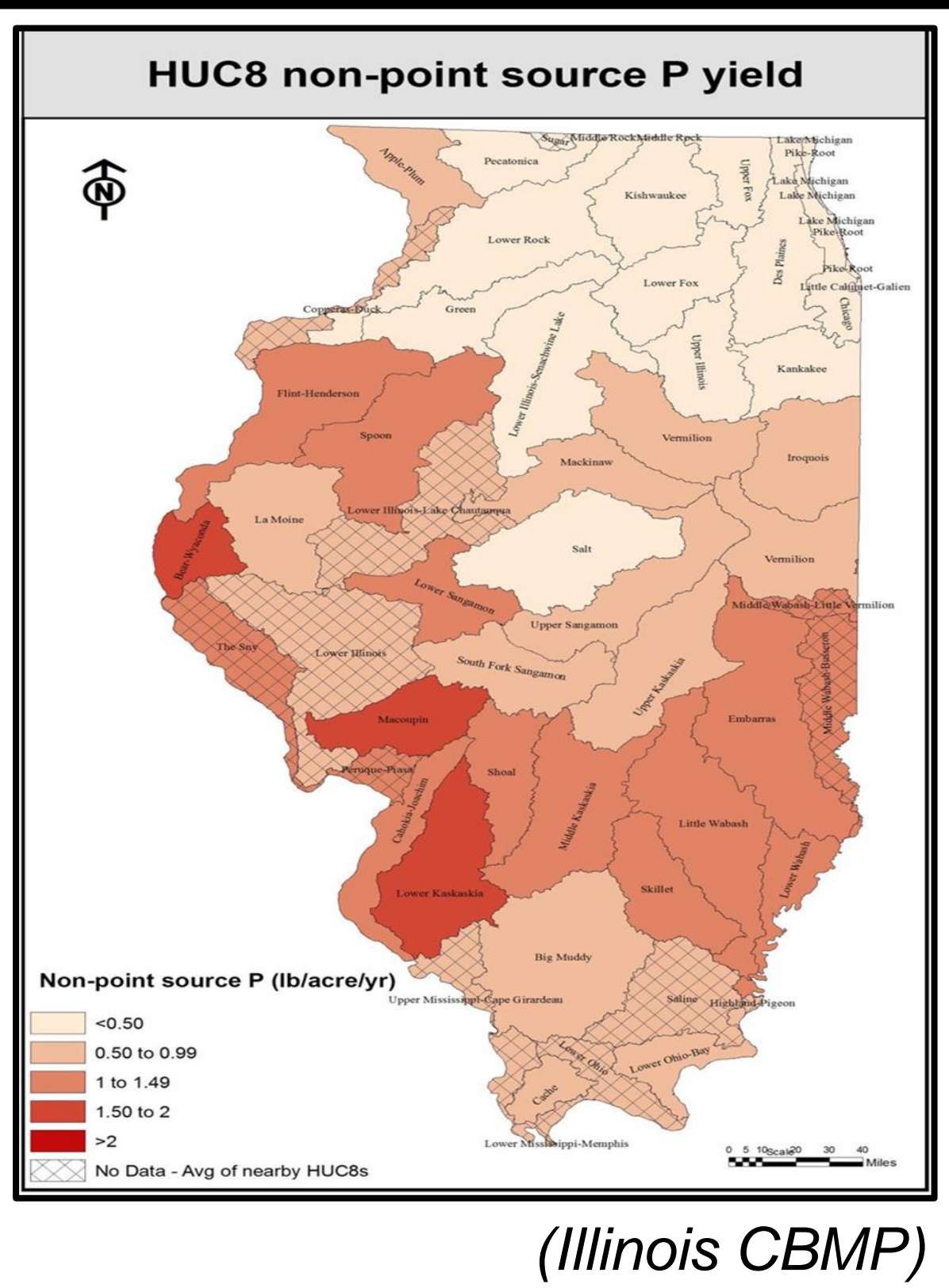
I Assessing the Phosphorus Loss Reduction Potential of a Slow Release Fertilizer Struvite for the Midwest

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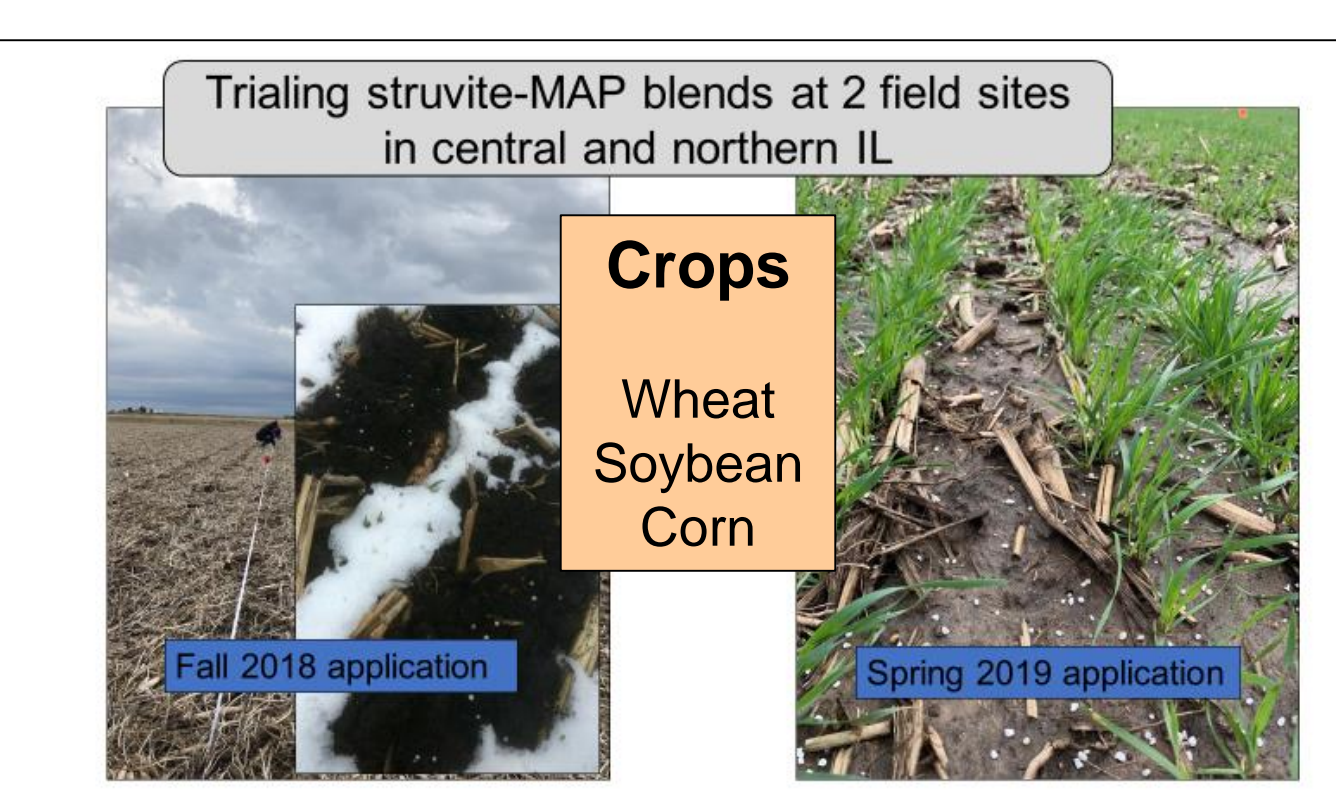
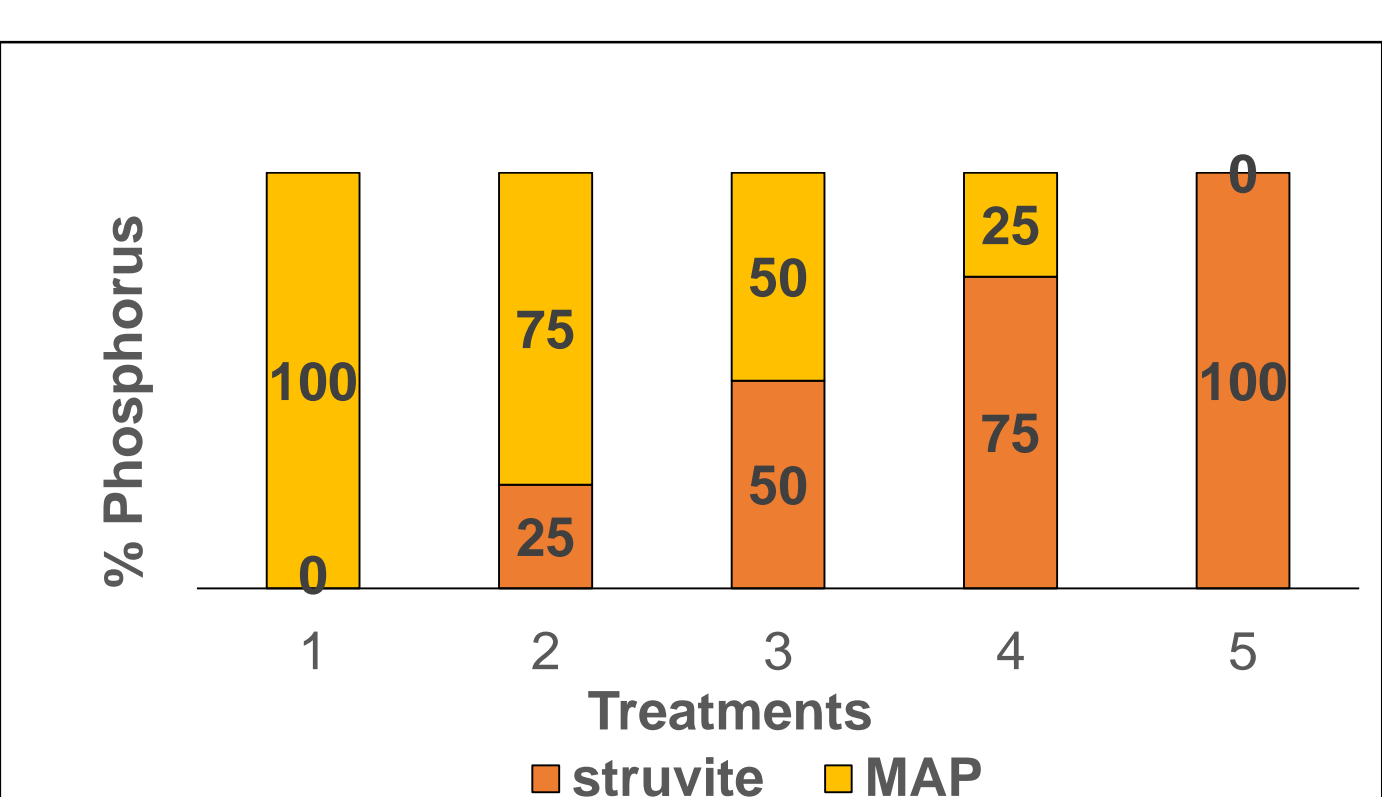
Introduction

- Eutrophication of inland and coastal water bodies from non-point P loss has necessitated novel approaches to nutrient stewardship
- Need for P management tools that can be integrated into existing production practices
- A potential P loss reduction strategy is slow-release P fertilizer (struvite)



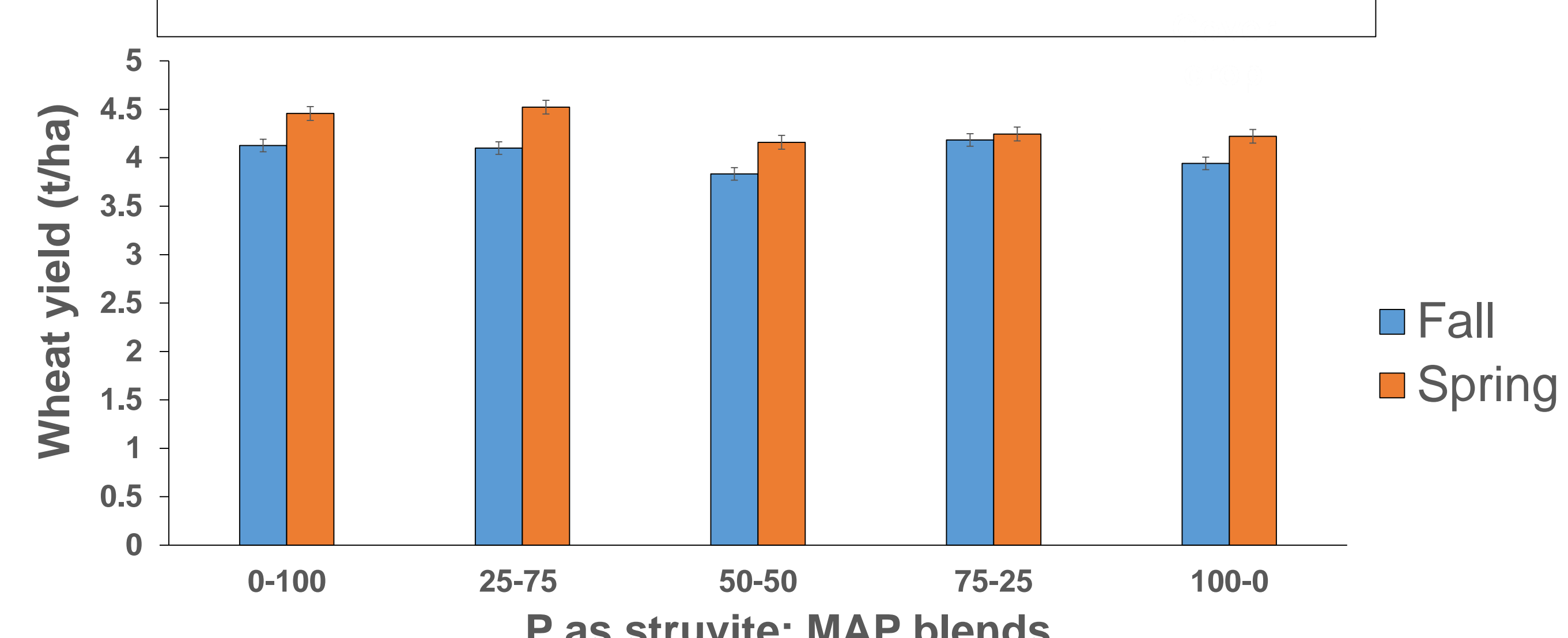
Experimental design

6 x 2 factorial Randomized Complete Block Design



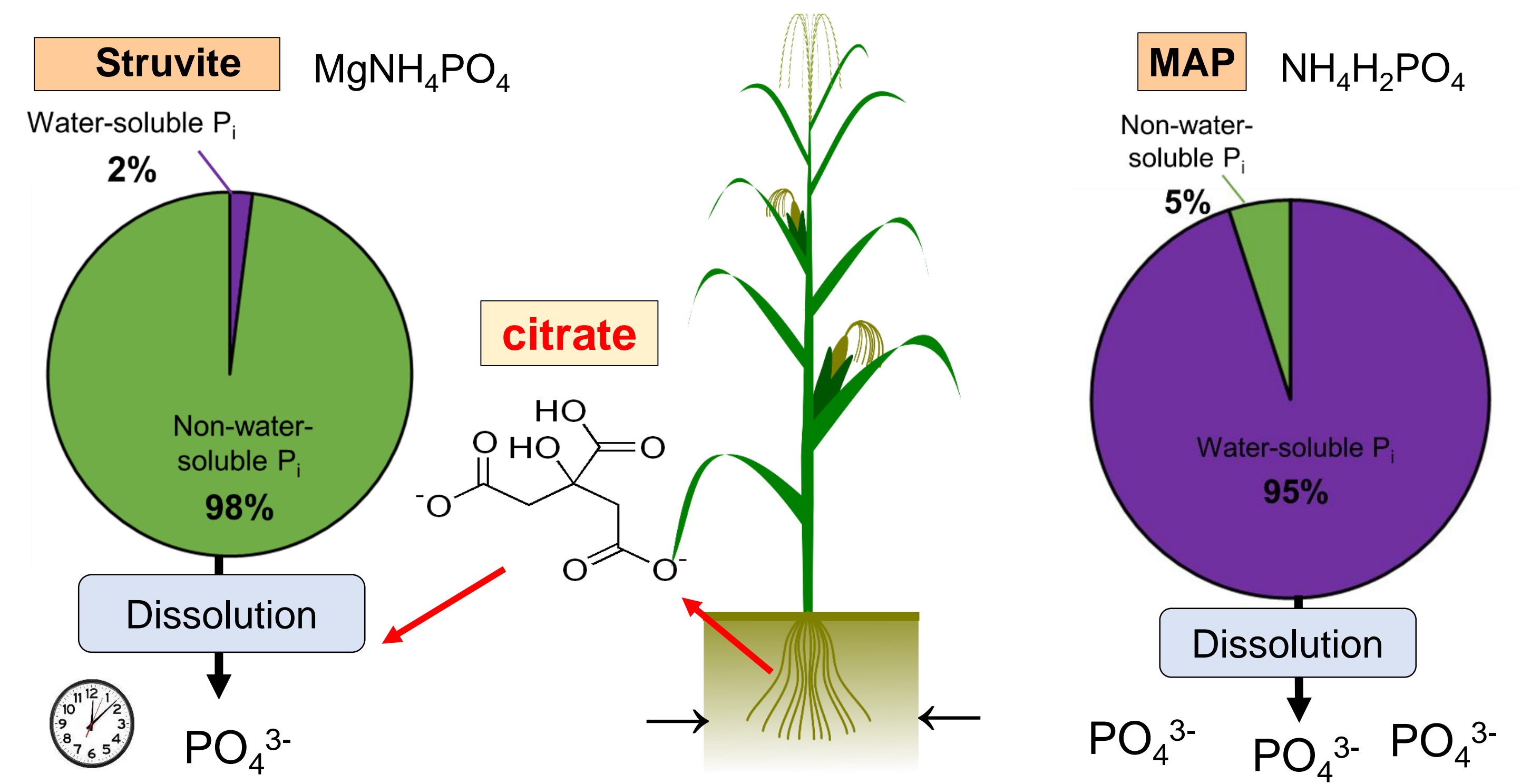
Results and discussion

Fertilizer source and timing effects on wheat yield

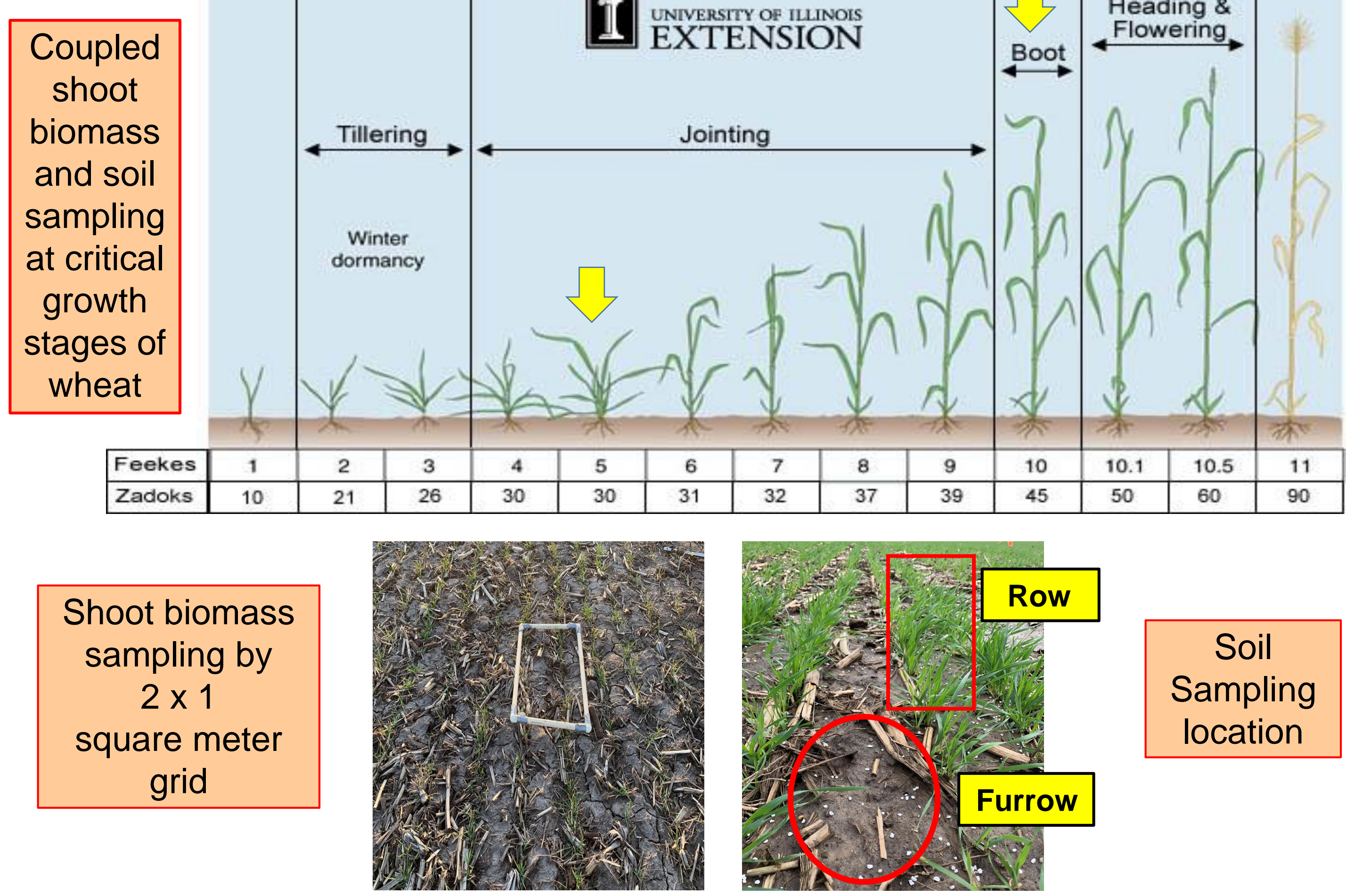


All the treatments were statistically same at $p < 0.05$

Struvite vs MAP



Methods and data collection



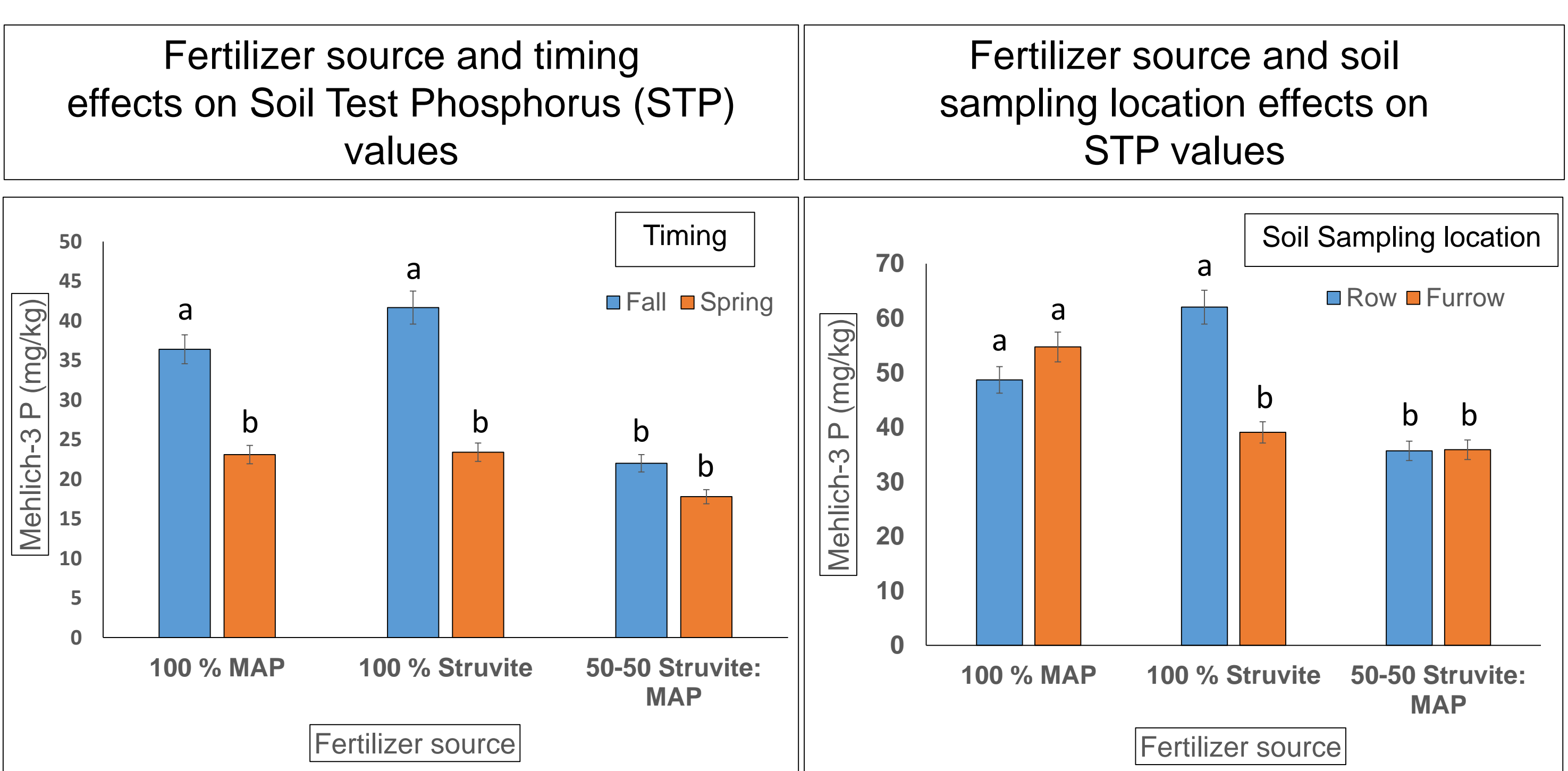
Research objective

Evaluate the agronomic efficiency of struvite as a slow release P source for corn, soybean and wheat and P loss risk compared to monoammonium phosphate (MAP)

Research questions

- To what extent can struvite replace MAP as a potential P fertilizer for the Midwest?
- Can fertilizer application timing influence the availability of P to plants and build-up of residual Soil Test Phosphorus (STP) levels?
 - Does root-exudate driven dissolution of struvite manifest at the field scale?

Results and discussion



Can fertilizer application timing influence the availability of P to plants and build-up of residual STP levels?

Does root-exudate driven dissolution of struvite manifest at the field scale?

Summary and conclusion

- Can fertilizer application timing influence the build-up of residual STP levels and availability of P to plants?
 - Yields maintained across struvite substitution gradient
 - STP differences across row vs furrow consistent with hypothesized exudate mechanism
 - However, STP increases under full struvite substitution unexpected; P balance necessary (Plant P uptake)
- Does root-exudate driven dissolution of struvite manifest at the field scale?
 - Yes, and it might increase STP.

Can struvite replace MAP as a potential P fertilizer for Illinois Agriculture?

Yes
Soils with adequate STP are suitable for partial to complete substitution of MAP with struvite.