**AVAIL® Treated Phosphorus Rate Effects as a function of Erosion Severity on Dryland Winter Wheat in a Calcareous Soil**

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**Background**

- Dryland winter wheat growers in the area face the challenge of meeting crop needs with adequate phosphorus **before it is fixed** via adsorption or precipitation.
- **AVAIL®**: A polymer purported to increase P availability. Shown to increase yield when applied with ½ recommended rate of P fertilizer (1).
- Two Experiments: Broadcast Exp. 2017 (WE_17) and Banded Exp. 2018 (WE_18)
- **Godfrey Farm, Clarkston, UT**: Broadcast Experiment (WE_17) and Banded Experiment (WE_18).

**Objective**

- To find what effects AVAIL® has with MAP when applied as a mid-season broadcast fertilizer, or incorporated with the seed at planting, on dryland winter wheat in a calcareous soil over four levels of erosional severity.

**Materials and Methods**

- **Soil**: Silt Loam and Silty Clay Loam. Precip= 21 in., MAT= 47 °F (Utah Climate Center. CaCO3: 0 -13% to 1ft. Location: Godfrey Farm, Clarkston, UT.
- **Seed** used for WE_17: Lucin Clearfield, WE_18: Magic Clearfield. Seed for both experiments were planted perpendicular to slope to mitigate erosion.
- **Fertilizer**: granular Monoammonium Phosphate (MAP): 11-52-0
- **Full Rate**: 60 lbs P₂O₅/acre, **Half Rate**: 30 lbs P₂O₅/acre
- **AVAIL®** additive sprayed onto granular MAP via cement mixer.

**Broadcast Experiment (WE_17) Results**

- **No significance between treatments within any slope segment.**

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**Discussion**

- **Spring broadcast** applied fertilizer may have some effect on yield, but the lack of significance between the four fertilizer treatments means a grower can save roughly $18.85/acre by applying 30 lbs/acre of MAP without AVAIL® as a spring broadcast than the recommended rate of MAP with AVAIL® for dryland small grain.
- If grower experienced similar yield results to this experiment, they could supplement 30 lbs/acre of MAP with AVAIL® for comparable or best yields and still save $16.38/acre.
- Having CaCO₃ and Organic Matter ranges for each level of erosional severity may give us a correlation of their impact on yield. If they do have statistical effect on yield, we can make improved fertilizer recommendations to growers based on more than just plant needs.

**Conclusions**

- **Soil P** (P = 0.0344) and **Erosion** (P<0.0001) have statistically significant effects on yield.
- There is **no significance** between treatments within erosional severity segments on yield or protein content.
- ½ rate with AVAIL® had higher yields than ½ rate without AVAIL® across all segments. This trend does not hold for the full rate treatments.
- While ½ rate of MAP with AVAIL® had comparable or better yield and profit results with the full rate of MAP without AVAIL® and was not economically advantageous only in the slightly eroded slope segment.

**Resources**


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