

Biological Corn Seed Coatings Influence on Soil and Plant Health

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Introduction

Seed treatments have been applied since the 17th century. Since the 1990s, these have been revamped and exponentially increasing in use. Biological seed treatments have gained the most spotlight due to the connection with soil health, mainly in terms of potential beneficial relationships within soil biota and increasing soil health in general. BASF has developed a biological seed treatment called Poncho[®] Votivo[®] 2.0 (PV2.0), which is marketed to improve yields by 3.8 bushels/acre in addition to improving soil health that would make nutrients more plant-available. Other potential benefits include protecting roots from harmful nematodes and stimulating root growth at earlier stages to increase plant vigor.

This project focuses on different concentrations of biological seed treatments and the influence on soil and plant health indicators. The main objective is to understand if biological seed coatings will increase plant health via soil health.

Materials and Methods

This experiment is located in central and northwest Iowa in a randomized block design. Only the northwest Iowa location will be presented here. The corn seeds used have five predefined concentrations and combinations of the PV2.0 product, a non-coated seed with base fungicide treatment, and a complete control seed with no treatments (Table 1). In addition to the treatments, there are two different hybrids per location. In northwest Iowa the following hybrids were used: JS9101SS RIB (hybrid A) and LC0488 VT2PRIB (hybrid B). This planting followed soybean and was planted in 30-in. rows with a seeding rate of 35,000 seeds/acre. There were 150 lb of N/acre applied pre-planting.

Results and Discussion

Both hybrids showed no significant difference in yield with any of the treatments when compared with the control (Figure 1). The yield for hybrid A ranged from 209 to 230 bushels/acre with an average yield of 222 bushels/acre. For hybrid B, yields ranged from 210 to 243 bushels/acre with an average of 233 bushels/acre.

Acknowledgements

This project would not have been possible without funding, seed donations, and seed treatment products from BASF.

Table 1. Treatments at Sutherland, Iowa 2019

Number	Treatment	Abbreviation	Base Fungicide	Poncho	Votivo	TWO.O
1	Control	Control	-	-	-	-
2	Base Fungicide	Base	*	-	-	-
3	Low Poncho	LP	*	.25 mg/seed	-	-
4	High Poncho	HP	*	.5mg/seed	-	-
5	High Poncho Votivo	HPV	*	↓	.1mg/seed	-
6	High Poncho Votivo 2.0	HPV2	*	↓	↓	55ml/50000 seeds
7	Very High Poncho Votivo 2.0	VHPV2	*	+ .65 mg/seed	↓	↓

- no application of product

* base fungicide used: ALLE (2g/100 kg), PRO (7.5g/100 kg), FLU (7.5 g/100kg)

↓ same rate as previous treatment unless noted otherwise

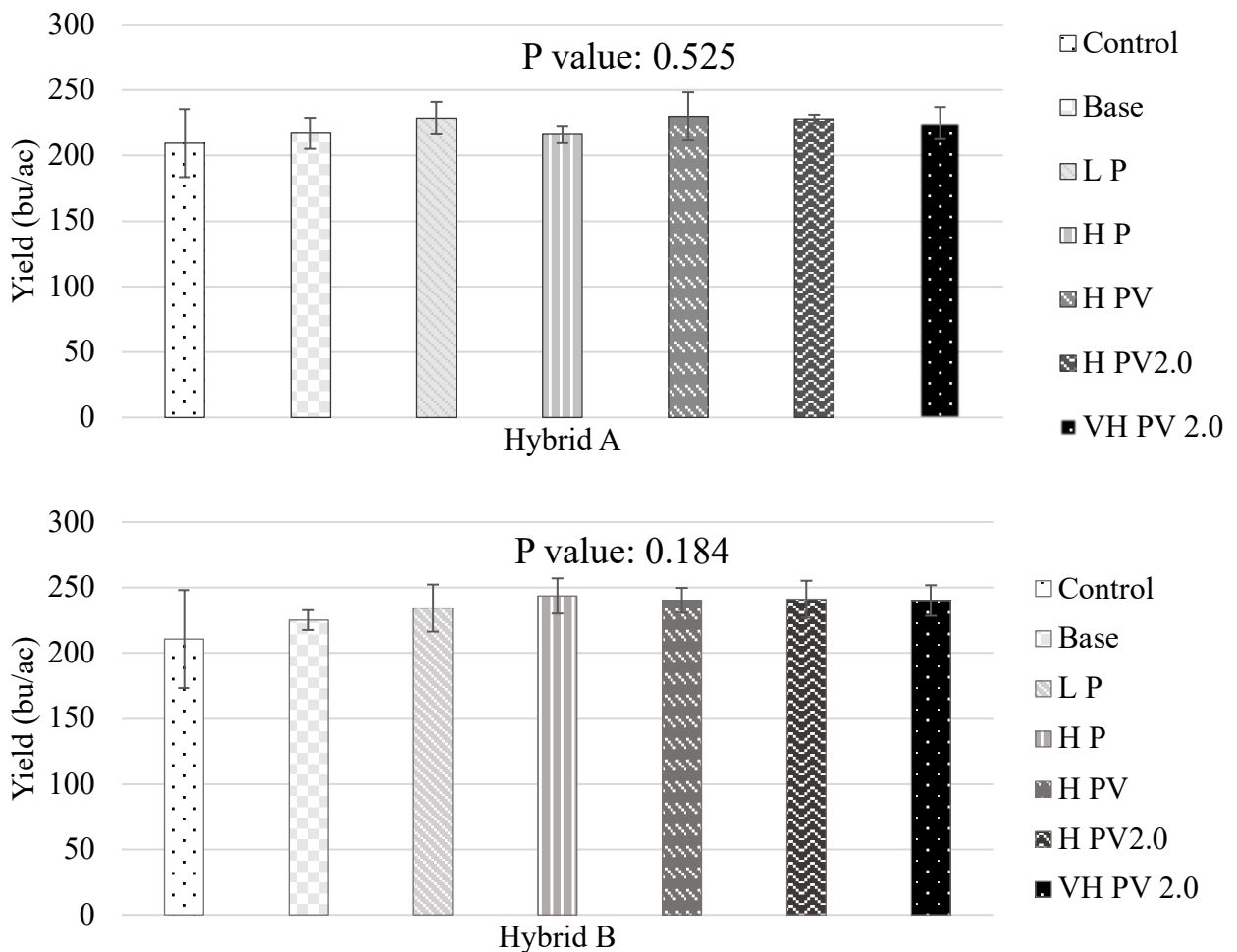


Figure 1. Yields of six seed treatments on two corn hybrids at ISU Northwest Research Farm, Sutherland, IA.*

*Seed treatment codes are shown in Table 1.