Huma® Organic 1-3 mm Dry Humate vs Biochar in Soybeans, With ROI of 4:1

Research Report

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Huma® Products: OM 1-3 mm Granular Humates

Background

Humates are used as soil amendments that have shown to improve crop production. The usage of biochar as a soil amendment has gained traction and has also shown to increase crop yield.

Objectives

The aim of this study was to test how preplant soil application of organic (OMRI-Listed) humates (**Huma® OM 1-3mm**) and biochar separately and combined will affect soybean yield.

Materials & Methods

About two weeks prior to planting soybean seeds, the biochar (from pinewood) and **Huma® OM 1-3mm** were soil applied and incorporated to experimental plots at the Red River Research Station, LSU AgCenter, Bossier City, Louisiana. The field experimental set up was a completely randomized design with four replications. Planting took place on May 15 and the crop was harvested on October 26. Table 1 describes the treatment application details. The Check treatment consisted of phosphorus fertilizer (P_2O_5 at 22.5 lb/acre) with triple super phosphate as the source (Table 1). **Huma® OM 1-3mm** and biochar were applied to plots that had already received 22.5 lb/acre of P_2O_5. (Table 1).

Table 1. Huma® OM 1-3mm and Biochar treatment description

Treatment	Amount/A	Method	Timing
1: Check = P_2O_5	22.5 lb	Broadcast disc	Preplant
2: Check + BioChar	22.5 lb + 2,000 lb	Broadcast disc	Preplant
3: Check + Huma® OM 1-3 mm	22.5 lb + 200 lb	Broadcast disc	Preplant
4: Check + BioChar + Huma® OM 1-3 mm	22.5 lb + 2,000 lb + 200 lb	Broadcast disc	Preplant

Results

The biochar and **Huma® OM 1-3mm** increased soybeans yield over the Check significantly (Figure 1). However, the yield differences between the biochar and **Huma® OM 1-3mm** were not statistically significant. The highest yield (83 bu/acre) resulted from combining Biochar with **Huma® OM 1-3mm** (Figure 1). The highest net income gain per acre ($253.99) and return on investment (4:1) were achieved by treating soil with **Huma® OM 1-3mm**.

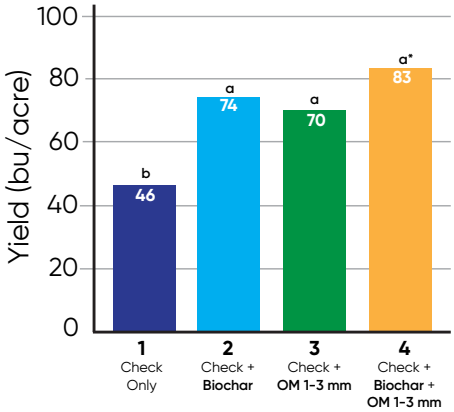

Figure 1. Soybean yield under various treatments

* Yield values with different letters are statistically different from others at 95% confidence level.

Table 2. Comparison of yield values and economics between the Check versus other treatments.

Treatment	Yield Diff. (bu/acre)	Yield Difference	Net Income Gain	ROI Ratio
1: Check = P_2O_5	0	0.00%	$0.00	
2: Check + BioChar	28	60.32%	$(24.60)	-0.1:1
3: Check + Huma® OM 1-3 mm	24	52.55%	$253.99	4:1
4: Check + BioChar + Huma® OM 1-3 mm	37	79.29%	$28.70	0.1:1

Conclusions

The soil amendments improved the yield of soybean crop. However, the cost effectiveness is quite visible with the **Huma® OM 1-3mm** (200 lb/acre) because it is applied at ten times less per acre than the biochar (2000 lb/acre). In addition, it costs more and takes longer to apply 2,000 pounds of a material than 200 pounds per acre. The soybean yield advantage of biochar over **Huma® OM 1-3mm** treatment was only 4 bu/acre and still had a negative ROI.

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