Using Soil Enhancements to Increase Zea mays Profitability in Limited Production Agricultural Areas

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The purpose of my project was to find an effective method of increasing yields in limited production agricultural areas. Finding a cost-effective way to increase production in previously unprofitable areas would increase farmers' financial stability and the overall efficiency of cropland. Procedures: TEST PLOTS: I applied the following products to 100 square feet of field corn at two plots in low producing areas: Lime, Gypsum, Poultry Manure, Worm Castings, Epsom Salt, and Sulfur. I observed the growth of the plants over time by measuring plant heights, shoot masses, stalk diameters, DGCI/SPAD readings, root lengths, and root masses. I collected and massed cobs 8-weeks after application and at harvest. I collected soil samples at the time of application and at harvest and tested them for nitrates, phosphates, potassium, and pH. IN-LAB PLANTINGS: I planted 30 seeds (3 per pot) per application/control and applied proportional rates of the applications to each pot. I observed emergence for 14 days and measured plant height at 2, 4, and 6 weeks. Six-weeks after planting, I uprooted the plants and measured root lengths, root masses, shoot masses, and DGCI/SPAD Readings for each plant. I found that Lime, Epsom Salt, and Worm Castings statistically improved the yields in the first plot, and every application statistically improved yields in the second plot. Some applications also increased yields by over 40%. In conclusion, the applications I tested could be used to increase the production and profitability of field corn in some of the Midwest's most difficult soils.

Awards Won:

Second Award of $1,500