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Soil & Plant Testing • Irrigation Scheduling • Pest Management
Contract Research • Crop Consulting

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Mr. Dallas Hess
Bio Flora North West
9757 Hwy 45
Nampa, ID 83686

RE: 2005 Research Projects

Dear Mr. Hess,

I greatly appreciate you asking me to conduct six field studies this year using Bio Flora products. I am quite impressed with your products, and have confidence your company's presence in Eastern Idaho will continue to grow. I also appreciate getting better acquainted with Dave Stewart and Brent Carpenter. They are very good to work with and were very helpful. Enclosed are the reports on trials conducted in Blackfoot, Idaho Falls, and Hamer. I hope you will be able to use the information and results to your benefit. I look forward to meeting with you and your staff to discuss these results in greater detail. Thank you again for your confidence in my services.

Sincerely,

Kelly W. Hurst

Field Trial: Potatoes

Discussion

The above data indicate minimal variation in several areas. Net profit variation ranged from 0.4 - 2.6%. Total yield variation ranged from 4.7 – 8.3%. Market value (price/cwt) varied only 0.2 – 8.2%. The item showing the greatest difference across treatments was fertilizer price (13.3 - 78.9%). The conventional treatment had the lowest gross dollar return per acre, but the lower price of the mark out mix still kept the net return within 2.6% of the other treatments. Petiole test data indicated nitrogen levels were substantially higher in the Bio Flora treated area. Phosphorous levels were slightly higher in the conventional strip. Potassium levels were unchanged across treatments.

Summary

This trial was designed to determine if Bio Flora products could replace the need for additional broadcast phosphorous fertilizers on high testing P soils. The data indicate this is precisely the case. By eliminating the broadcast phosphate fertilizer on high testing (50 ppm P) soils, yield and quality was nearly equal to adding 80 units broadcast phosphate. However, when the cost of fertilizers is factored in net profit was almost identical across treatments.

Field Trial: Sugar Beets

Results

Yield on the Bio Flora plot was 2.3 tons/acre (5.7%) higher than the conventional plot. Sugar percentage, nitrate, and conductivity were nearly identical on both plots, and were at acceptable levels. Net profit per acre was determined by subtracting the fertilizer cost from the gross return. The Bio Flora plot produced a \$44.34/acre higher profit (3.2%) over the conventional fertilizer program.

Discussion

This field was selected for this study for several reasons. Due to the high pH (8.3) and high excess lime content of 7.9%, phosphorous management has always been a challenge. The grower has applied large amounts of phosphate fertilizers in previous years to overcome the negative impact of the high pH and lime, and as a result, soil test P is quite high (30 ppm). I wanted to see if there was a way to retrieve some of the excess phosphate applied over the years by using Bio Flora products. Total phosphate applied on the Bio Flora side was 23 units P₂O₅, as compared with 50 units P₂O₅ on the conventional. Petiole analysis and beet tonnage indicated that phosphorous was not

deficient by using Bio Flora products. Another reason this field was selected was its history of low potassium. The sugar company agronomists are constantly advising the growers not to use potassium fertilizer, due to possible increased conductivity problems. However, farmers do not want to sacrifice yield by growing sugar beets in potassium deficient soils. I used this field to determine if we could use Bio K to substitute for 80 units K₂O. Again, petiole tests, beet tonnage, and a very acceptable conductivity number shows that no yield or quality was sacrificed by using Bio Flora products.

Observations throughout the season were made to compare beet stand, leaf color, and beet size. No differences were visible until harvest. While harvesting the plots, it was observed that the Bio Flora plot had a slightly better stand, and the beets were slightly smaller on average. Smaller beets do not cause a yield or quality problem if the stand is uniform. The stand on the Bio Flora plot was slightly better than the conventional side. The highly calcareous nature of the soil usually makes obtaining a desirable stand of sugar beets very difficult. During the spring of 2005, the area received several light rain showers which prevented the soil surface from crusting. Stands were much better than average as a result. Under normal conditions, one would expect to see a much more uniform beet stand by using Bio Flora products due to a high amount of high quality humic acid contained therein.

Summary

A split field trial was conducted in 2005 on sugar beets in the Blackfoot, Idaho area to compare a fertilizer program using Bio Flora products with a "conventional" fertilizer program. Yield on the Bio Flora plot was 2.3 tons/acre (5.7%) higher than the conventional plot. Sugar percentage, nitrate, and conductivity were nearly identical on both plots, and were at acceptable levels. Net profit per acre was \$44.34/acre (3.2%) where the Bio Flora products were used. The use of Bio Flora products appears to be a viable tool in sugar beet production.

Field Trial: Malt Barley

Discussion

The data above are averages of four replications on each treatment area. A yield increase of 9.7 bushel/acre (7.7%) was produced by the Bio Flora treatment. Test weight, thins, plump, and germination were all at acceptable levels and very little differences were shown among treatments. The Bio Flora treated barley produced higher protein (13.8%) than the conventional fertilizer mix (12.3%). During most years, the grower would be docked \$0.05/cwt for each 0.1% protein above 13.5%. The Busch policy for the year 2005, however, has been changed. Any barley testing higher than 13.5% would be rejected. The barley under this extreme policy change would not meet contract specifications due to protein. All other parameters are acceptable. The data indicate that total nitrogen fertilizer amounts need to be reduced if Bio Flora products are used on malt barley. If the amount of nitrogen required can be properly adjusted downward, malt barley growers could realize more profit using Bio Flora products as long as the increased yield can be maintained.

Summary

The use of a Bio Flora starter mix was compared to a grower's "conventional" starter mix on Harrington malt barley on sandy soil. A yield increase of 9.7 bushel/acre (7.7%) was achieved using the Bio Flora mix. Protein percentage was higher using the Bio Flora mix, resulting in a \$0.15/cwt price reduction or possible contract rejection. More research is needed to determine how much nitrogen fertilizer needs to be reduced to raise malt barley with acceptable protein levels.