

Managing Important Components of Intensive Production Systems in Soybean.

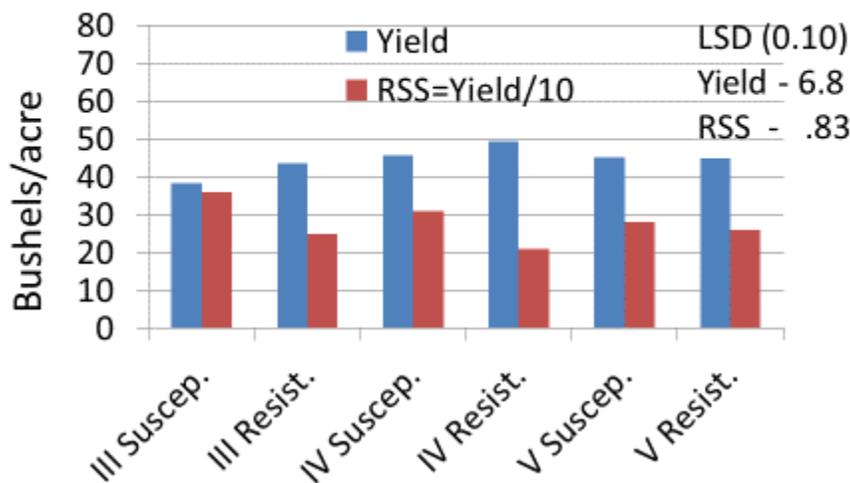
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Activity for the quarter ending February 28, 2017 in the project included taking plant samples, and combining plots while implementing plans for 8 objectives in the proposal. Plots are now harvested and plot and data analysis is complete.

Objective 1 - Genetic Potential for Response.

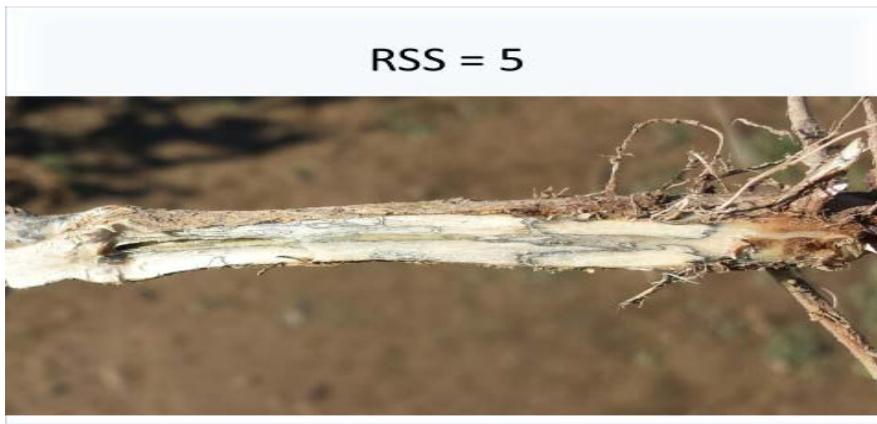
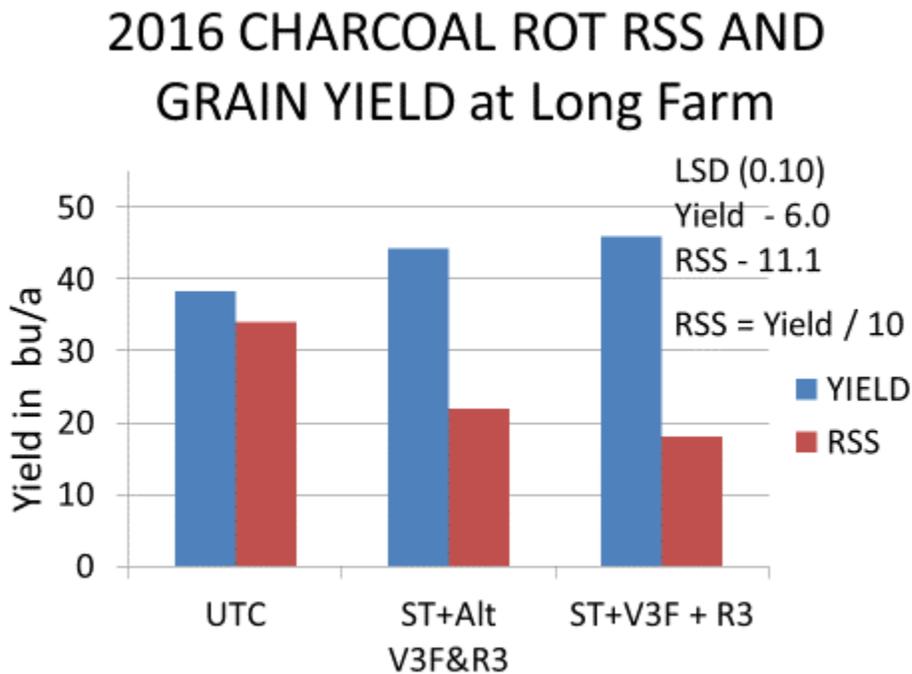
Twenty varieties with varying response to charcoal rot are compared to determine their potential under both conventional (check) and intensive management. All maturities are mature with harvest done. Charcoal rot ratings (RSS) were conducted after harvest. Maturities ranged from early MG III to MG VI. Data indicated that there were differences in grain yield and charcoal rot damage indicated by RSS. Those lines in MG III and IV that had some resistance to charcoal rot had lower RSS levels. MG V were marginally though not significantly so. MG IV lines had the greatest yield and responded to seasonal rainfall better than either MG III or Vs. The lack of response in the MG V in either grain yield or RSS may be the result of cooler temperatures and greater rainfall after bloom, which would be later than either MG III or IV plants.

2016 Selected Lines Effect on Grain Yield and RSS



Objective 2 – BMP's for fungicides.

A second study with a variety that responds to intensive management, KS5004, has different treatments at V3/4 and at R2/3. It is a comparison of generic treatments and standard treatments to an untreated check (UTC). Treatments at V3/4 and R2/3 included fungicide at V3/4 and fungicide and insecticide at R2/3. These treatments will then be afforded maximum yield by other intensive management techniques. Treatment effects on plant health, grain yield, and charcoal rot will be assessed during the season. Standard treatments and generic treatments yielded more and had lower RSS than the UTC. The generic treatment was not quite the equal of the standard treatment in yield or RSS but still comparable.



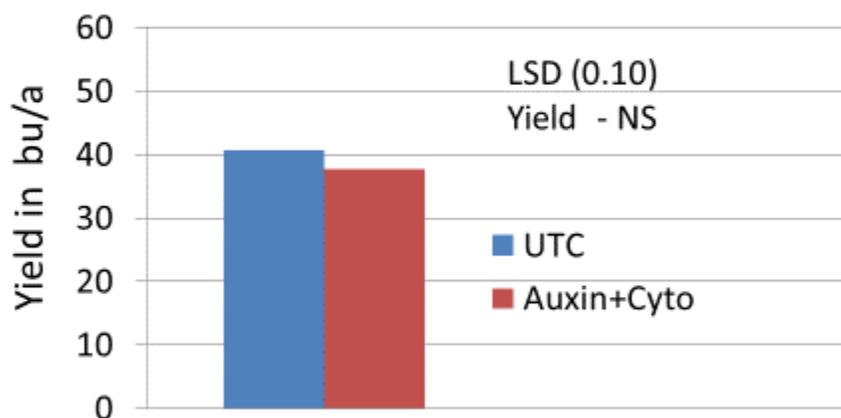
RSS = 1



Objective 3 – PGR use on soybean

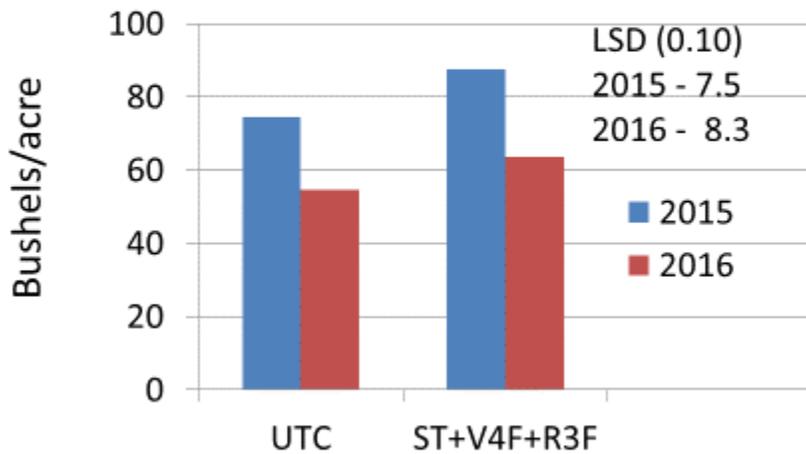
Another study was planted and treatments completed to compare PGR use on soybean to enhance soybean growth and yield especially early in the season. In addition early application and late application of N fertilizer were evaluated with this study and reported later. Results indicated no significant effect of PGRs on grain yield in 2016.

2016 Plant Growth Regulator Effect on Soybean Yield



Objective 4. - Continue high Yield work under irrigated and non-irrigated conditions. This study was planted and treated to compare intensive management under irrigation in Kansas. Soybean grew rapidly and many plants had 5 and 6 pods per node. Coupled with high populations the irrigated soybean grown under high management showed an improvement over an untreated check (UTC) in 2015. Grain yields in 2016 were not significantly improved as yields were generally lower due to heavy rain and winds at first bloom. This caused severe lodging in many treatments and reduced grain yield

2015-16 Irrigated Soybean Grain Yield

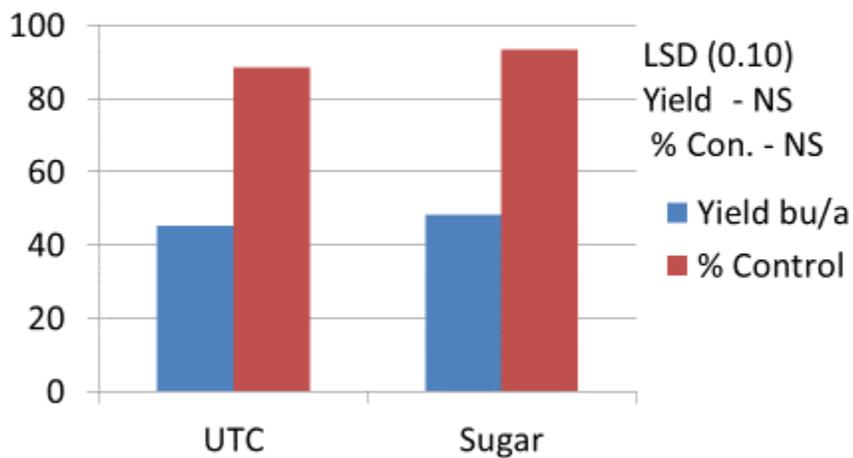


Drilled Irrigated High Yield Study



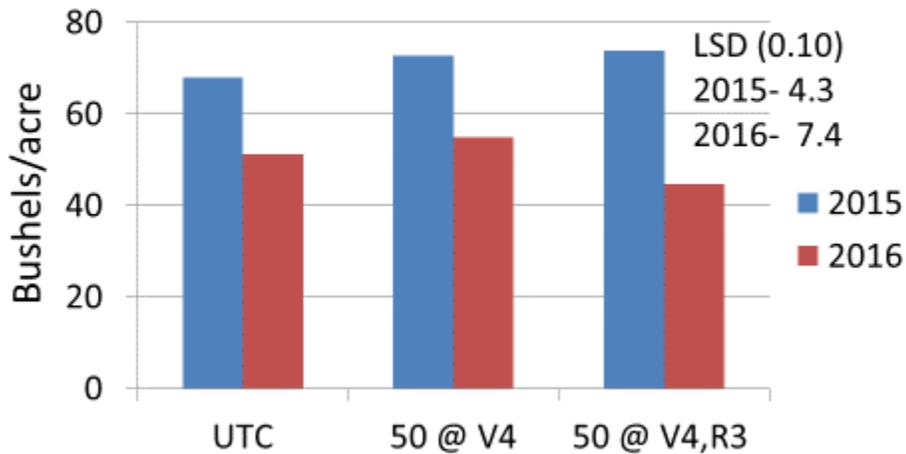
Objective 5. - Explore the use of novel compounds like sugar added to spray components to determine if there is an effect and what that effect might be. Sugar was applied as an additive to spray treatments at R3 with Headline at 6 oz/a. Results indicate no effect of added sugar on grain yield in either 2015 or 2016. Sugar acted as a sticker/adjuvant during the season but did not increase foliar disease control. Soybean were severely lodged during a heavy rain / wind storm during the R1/2 growth stage.

2016 Sugar as a Spray Component

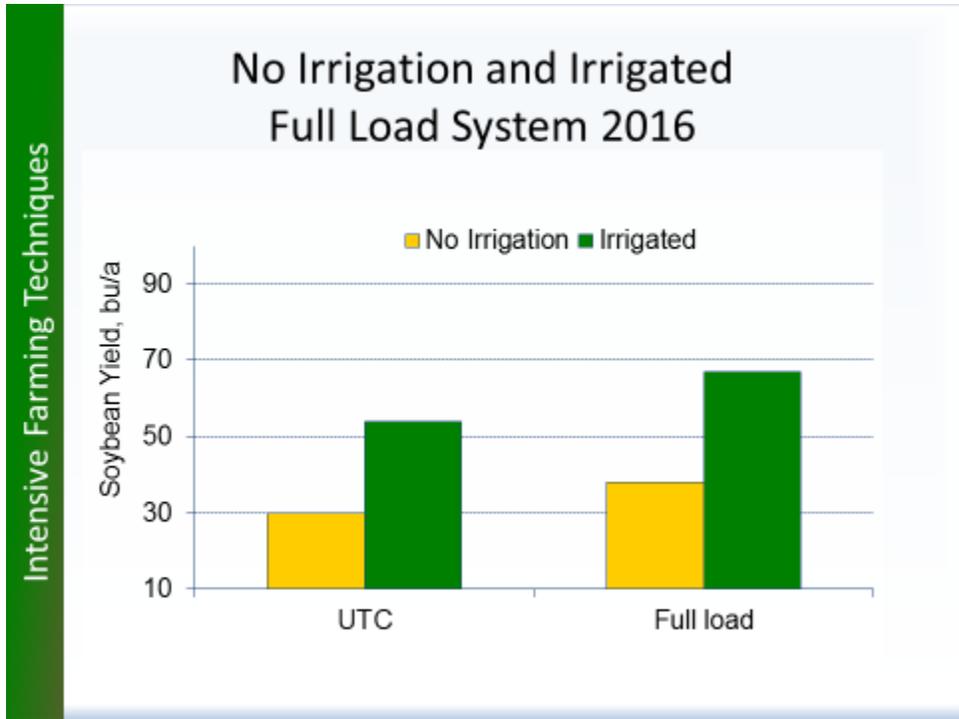


Objective 6. – The effect of added nitrogen (N) was determined for 2015 and 2016. 50 units of N were added at V4 and then again at R3 and compared to a no treatment check (UTC). Added N increased yield in 2015 but not 2016. Growing conditions were very good in both years, however, a late wind storm caused increased lodging in plots with greatest amounts of N. Future research will concentrate on the effect of small amounts of added N at each addition of water under irrigation.

2015-16 Added N on Soybean Grain Yield



Objective 7. - Put a complete package of treatments together and see if effects are merely additive or are synergistic. The key to the complete package is component and overall cost. This will be done with several studies that have comprehensive treatment plans in them. All treatments have been applied and are looking good. Results indicate that a full load system with seed treatment, V3 fungicide with PGR - auxin, and R3 fungicide + insecticide outyielded the untreated check (UTC) in both non-irrigated and irrigated conditions. Non irrigated yields were 8 bushel to the acre higher under full load while the irrigated full load increased yields by 13 bushel per acre. Stands were increased, there was less charcoal rot and a late season soybean pod worm infestation was stopped using the full load system.



Objective 8. - Work on new delivery methods of research data for my project and determine if it is applicable to other projects. I have begun work with a computer programmer to determine best methods of data delivery. These include data delivery through incorporation into existing web pages, development of new web pages, and application development for both computer and phone delivery. We are currently uploading information to the national web site.