Ending Report for Kansas Soybean Commission. April 15, 2023

The Technology, Including Traits and Inputs Needed to Produce a Modern Soybean Crop.

James H. Long Ph.D.

# Soybean Plots Long Farm

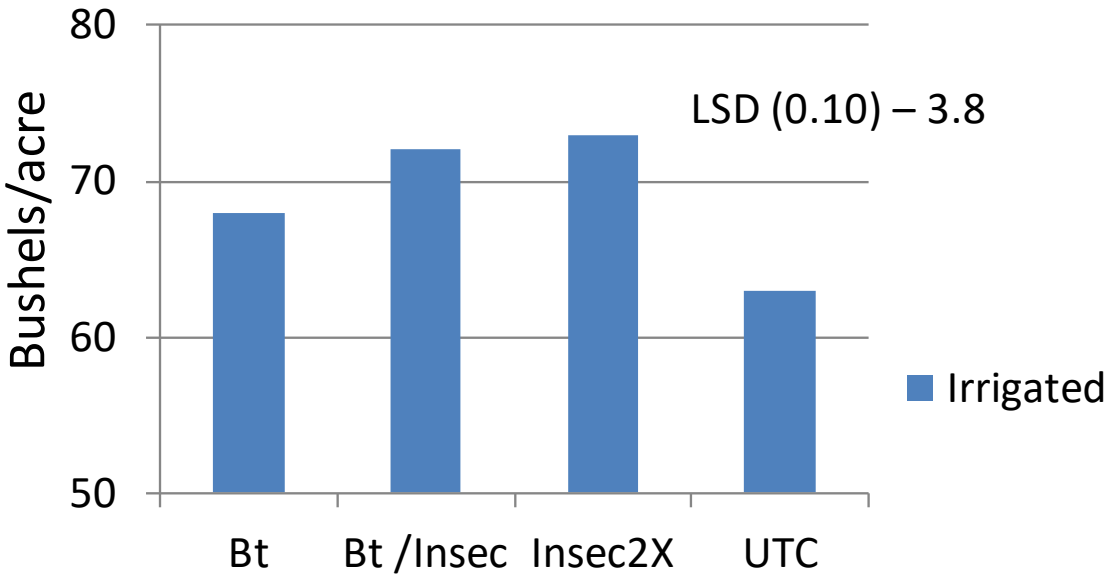
Activity for the three years ending, April 15, 2023, in the project includes land preparation, fertilization, herbicide application and planting of plots. Development of methods such as in crop, disease and insect models has begun. Irrigated plots were planted the last week of April, wth adequate stands. Non-irrigated soybean were planted in late May to moisture. Both non-irrigated and Irrigated soybean were planted with a plot grain drill in 7-inch rows. Weather patterns showed both historical drought and flood during this 3 year period and we had both very poor and excellent yields. Insects began to show up in numbers in trap/sentinel crops and light traps in July with leaf feeding insects and Septoria leaf disease making first appearance at that time. Soybean pod worm eggs began to show up in a few sentinel plots, with frogeye leaf spot showing in August. In mid August, damage to soybean pods from soybean pod worm began to occur in scattered fields. By August 15, moderate damage appeared and treatment was made to all plots receiving both insecticide. Frogeye leaf spot was occurring on approximately 10 percent of leaves (bottom of canopy) with 20 percent leaf coverage. Black light traps and sentinel plots both showed increased insect activity during this time. Labelled rates of insecticides used included carbaryl, and Bacillus thuringiensis, while no fungicides were used, as no disease reached treatment levels in these years.

# OBJECTIVE 1. Evaluate the use and effect of biologicals in soybean production.

Evaluate existing and historical biological control methods such as Bacillus thuringiensis to keep low levels of pests such as pod worms. Use of insecticide increased yield. Bt did also but was not as effective.

Table 1.

2020-22 Bt Effect on SoybeanYield

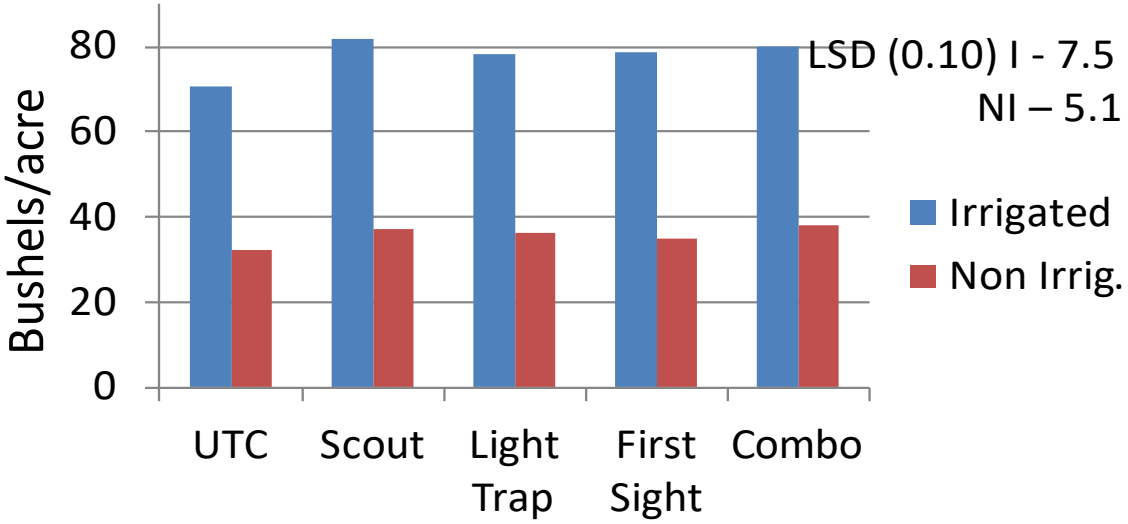


# Objective 2. Development of practical IPM

Use a blend of modern and historical techniques to determine treatment for insect pests in an attempt to maintain low populations that will not reach damaging levels. Scouting or a combination of pest sightings with scouting increased yield.

Table 2.

2020-22 Detection for Treatment Effect on Soybean Grain Yield

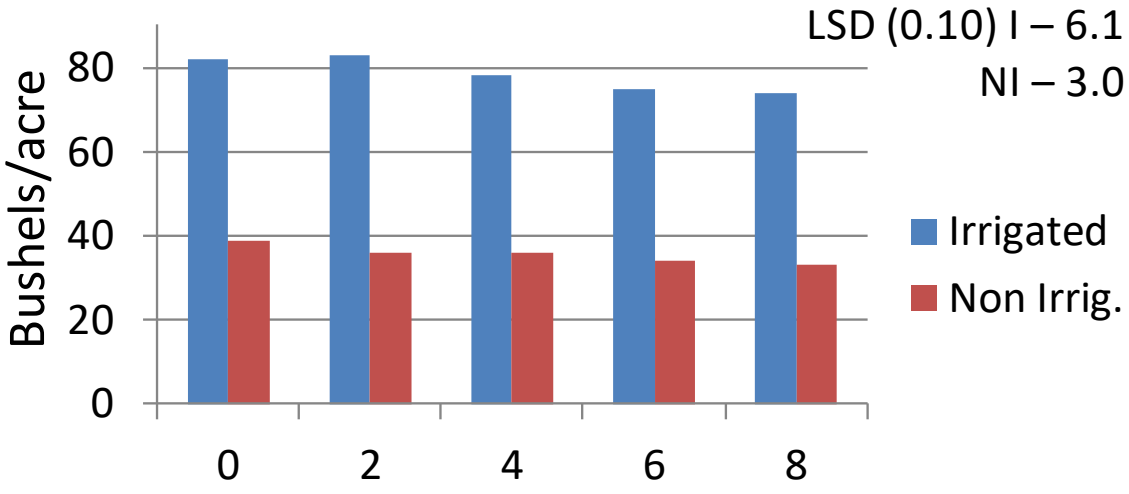


# Objective 3. Are scouting models effective?

Current methods determine threshold levels for insect numbers or disease and we often scout, then treat upon finding high numbers or damage yet we struggle with timeliness in the field. This study determines yield loss over time.

Table 3.

2020-22.Days After Pod Worm Threshold Treatment Effect on Soybean Grain Yield



# Objective 4. Are seed treatments the future.

We could talk for hours about seed treatment technology, and what can be accomplished with modern treatments. In a word, YES, seed treatments work and are needed. Complex treatments are now the rule. Some states are now reviewing them.

Seed treatments across even three years were changing so fast with numbers of products within a seed treatment and a cascade effect of new treatments, both standard and biological that I could not establish a common treatment to compare with what we already use.

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