# Corn & Soybean News

March 2023

Volume 5, Issue 3

COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Grain and Forage Center of Excellence

University of Kentucky

# Kentucky Soybean Planting Recommendations

After experiencing the warmest winter on record for most of the state, producers are gearing up for planting season. With above average soil temperatures some may even be tempted to plant earlier than usual. Regardless, it is always good to refresh with the fundamentals of soybean planting in Kentucky.

## Planting Date and Soil Temperature

To achieve maximum yield of a full-season soybean crop the recommended planting date for Western Kentucky is mid-April through early May and by mid-May in Central Kentucky, but soil temperatures need to be warm enough before starting. Soil temperatures 2 inches below the ground need to reach and **sustain** at least 50°F, and there also needs to be no risk for a killing freeze. Cool, wet soil conditions can result in delayed emergence as well as slower germination. Seed vigor is important to know when planting into cool, wet conditions. Vigor ratings are not on most seed labels but can easily be obtained by asking the seed dealer or submitting a sample to **UK regulatory services.**

## Seed Treatment and Pest Management

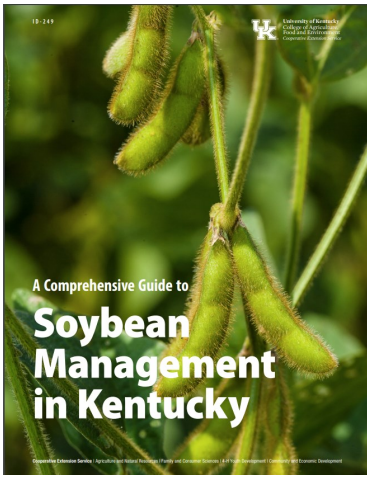
If soybeans are planted into cooler soil conditions, precautions such as fungicide and insecticide seed treatments should also be considered. Fields with a history of Sudden Death Syndrome (SDS) can still be planted early, however, specific seed treatment products that have efficacy against SDS and highly resistant varieties should be considered. Insect pressure can also cause stand loses. Bean leaf beetle damage can be easily identified by pitting of the cotyledons after emergence. An insecticide seed treatment should also be considered, especially if an early planting date is attempted.

## Planting Depth, Seeding Rate and Inoculant

The recommended harvest population of soybean plants is 100,000 plants/acre. With all factors being

considered such as germination rate, stand losses from insects, seedling diseases, and cool soil conditions, seeding rate should reflect the expected losses to these factors. Soybeans should be planted between 1 and 2 inches deep in the soil. If seeding depth is deeper, the risk increases for the seed not emerging from ground. Fields that have been overly wet through the winter or have not had a recent history of soybean planting, 3 to 5 years, should be inoculated when planting.

Additional information is available in UK extension publication ID: 249: Soybean Management in Kentucky and AGR-130.





**Conner Raymond**
Extension Associate Grain Crops
(859) 365-7541 ext 21352
Conner.raymond@uky.edu

**Carrie Knott, Ph.D.**
Grain Crops Extension Specialist,
Princeton UKREC Managing Director
(859) 562-1320
Carrie.Knott@uky.edu
@KYGrains


Grain and Forage Center of Excellence
*College of Agriculture, Food and Environment*

# Saving Irrigation Water with Short-Season Varieties

Irrigation makes deserts bloom and reduces risk in humid climates. Unfortunately, water for irrigation is getting scarce as a result of multi-year droughts and depletion of aquifers. Climate change is responsible for some of this scarcity, so it will get worse before it gets better. Growers are forced to adopt practices that use water more efficiently (using less water to produce the same yield) to extend water supplies. Growing short- season grain crop varieties that produce the same yield with less water is one way to be more efficient or to have your cake and eat it too.

Short-season varieties mature early or very early at a location. At Lexington, Kentucky (38° N. latitude) where I work, soybean varieties from maturity group (MG) I and II are early or short-season varieties while MG IV varieties are full season. Touting short-season varieties seems to contradict the age-old philosophy held by many that a full-season variety will produce the highest yield because it utilizes all of the growing season. A short-season variety, however, can produce maximum or near maximum yield while utilizing only part of the growing season. We can understand this apparent contradiction by considering how the two phases of crop growth relate to yield.

Vegetative growth occurs first as the crop produces the stems, roots and leaves that will produce the sugars that sustain growth. Reproductive growth begins when the crop flowers and produces the seeds that are harvested as yield. All crops follow this two-phase system, although in some crops (e.g., soybean), reproductive growth starts before vegetative growth stops.

The length of the vegetative phase increases as variety maturity is delayed (total growth duration is longer), but, and this is the key point, the length of the reproductive phase stops increasing when the total growth duration exceeds approximately 100 to110 days. The reproductive phase of a variety with a 100- day total growth duration will be the same length as a 130-day variety or, conversely, shortening the total growth duration from 130 to 100 days has no effect on the length of the reproductive phase. The 100-day variety will have a shorter vegetative phase resulting in a smaller plant. This relationship between vegetative and reproductive growth makes it possible to save water with short-season varieties. Interestingly, these relationships seem to hold for most grain crop species.

Grain yield is not closely associated with the length of the vegetative phase, but it is with the length of the reproductive phase. If the reproductive phase of a short-season variety is just as long as a full-season variety, the yield of the two varieties will be the same but the shorter total-growth duration will require less water. Eureka, the grower can produce the same yield with less water!

We compared soybean varieties from MG I, II, III and IV (two varieties per MG) in a three-year irrigated, narrow-row experiment at Lexington, Kentucky where MG IV varieties are full season. The av-

erage yield of the MG II varieties was not different from the MG IV varieties, but the MG II varieties matured 19 days before the MG IV varieties. The MG II varieties produced the same yield in 15% less time which would translate into roughly 15% less water use. The yield of the MG I varieties was 14% less than the MG IV varieties with a 23% reduction in total growth duration (30 days less than the MG IV varieties) and water use. A 23% reduction in water use might be attractive, despite the yield loss, when faced with a severe water scarcity. Similar results were reported for soybean and corn by Larry Purcell and his group at the University of Arkansas. Short-season varieties can save water without sacrificing yield.

Narrow rows (15- to 20-inches) are critical for the success of an early-variety system. The smaller plants produced by the shorter vegetative phase of early varieties may not be able to intercept all the sunshine. Sunshine that hits the ground during reproductive growth is lost yield, so its important to reach complete ground cover before or very early in reproductive growth. Narrow rows will insure that early-maturing varieties will meet this criterion. Using narrow rows is not a problem with soybean, but there may be harvest issues with corn.

Using early-maturing varieties is one way to reduce water use and conserve scarce water supplies. The savings can be substantial, depending on the growth duration of the variety they replace. But the system is worthwhile even if the savings are small, because there is no cost. All the producer has to do is change varieties. No expensive equipment is needed. Saving water without spending money is a deal that's hard to beat!

**Dr. Dennis Egli**
Professor Emeritus
(859) 218-0753

# Sensitivity of USDA's 2023 Ag Outlook Forum Projections to Yield

At the 2023 Ag Outlook Forum, the United States Department of Agriculture (USDA) released its first projections for the 2023 crop year. This article examines the sensitivity of the stocks-to-use (STU) ratio to yield projection errors by the USDA. STU is the ratio of end-of-year commodity stocks over total commodity use. The USDA releases estimates on commodity supply, demand, exports, and imports, all of which are accounted for in the STU. As yield projections have a large margin of error in February, trendlines estimate future yield, which typically results in a higher yield projection than the previous year. It is worth noting that this analysis extrapolates USDA projections and does not control for market-changing factors such as weather or geopolitical tensions. Results indicate that soybean STU ratios are extremely sensitive to changes in yield which may indicate soybean price volatility. One limitation of this analysis is that we assume the USDA projections for harvested acres are correct, meaning the changes in production levels only come from missed yield projections. In reality, changes in harvested acres could offset yield-driven production changes. The analysis also does not consider potential changes in use that may occur as market conditions evolve. Outlook Forum Projections can be found at https://www.usda.gov/oce/ag-outlook-forum/commodity-outlooks.

**Sensitivity to Yield**

The STU ratio is typically given as a percentage and uses a simple calculation to quantify the estimated level of stocks at the end of the market year and the total crop demand. The formula for calculating STU is:

$$\frac{Beginning\ Stocks + Total\ Production - Total\ Use}{Total\ Use} \times 100$$

STU is a crucial measure in commodity marketing, providing some perspective on supply and demand for the commodity of interest. The numerator (top of the equation) quantifies the ending stocks of the commodity, and the denominator (bottom) quantifies the demand. Higher STU levels suggest that the market has more cushion to absorb supply shocks, while lower STU indicates that there is very little room for the market to handle decreases in production. Lower STU levels also mean that commodity prices are more sensitive to demand shocks; however, we focus on supply in this analysis.

Plot "A" shows the STU and prices for corn and soybeans from 2010-2022. The most important observation from "A" is that a high STU ratio typically indicates a higher supply of each commodity and, thus, lower prices. Vice versa, lower STUs are indicative of a higher crop price.

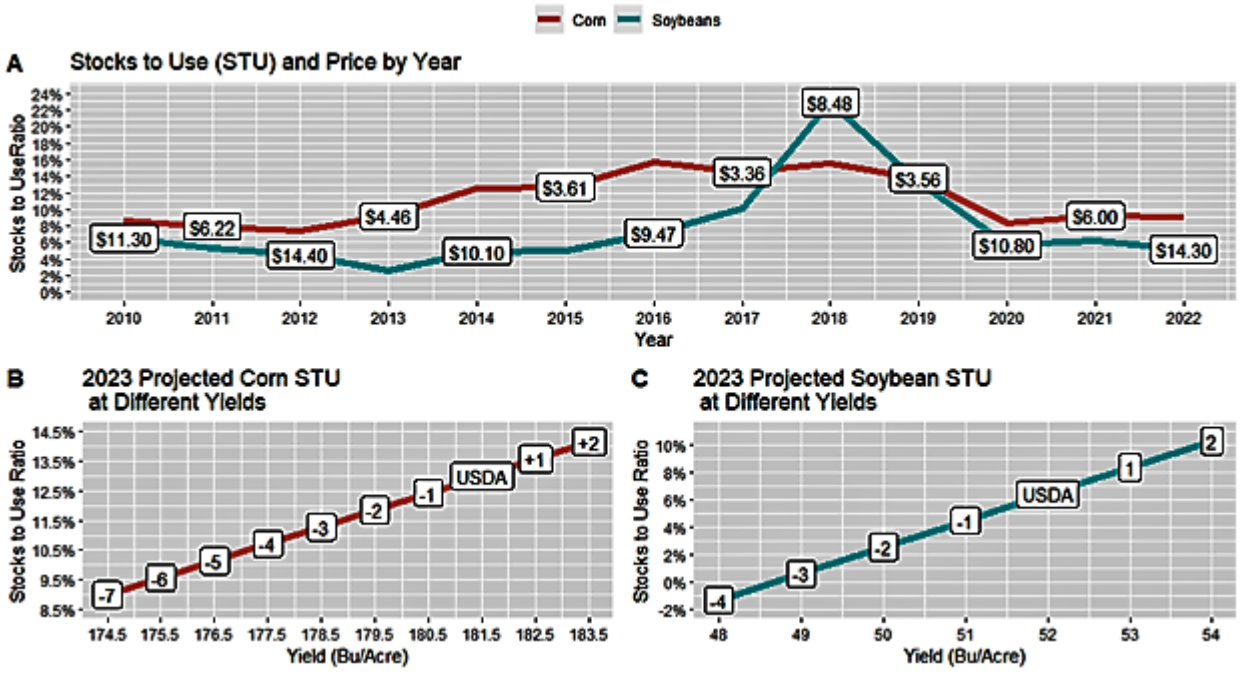
Plots "B" and "C" indicate that for the 2023 projections, a one-bushel change in U.S. average yield for corn and soybeans would change the STU ratio by 0.57% and 1.94%, respectively. These results show that USDA projections are much more sensitive to changes in soybean yield than corn yield. Soybean STU is more sensitive because of historically low projections for soybean ending stock levels. Additionally, a one-bushel change in soybean yield results in a much larger percentage of missed bushels due to soybeans producing fewer bushels per acre than corn.

## 2023 Corn and Soybean Projections

The current USDA projection for 2023 average corn yield is 181.5 bushels/acre, which results in a projected STU ratio of 13% and a price forecast of $5.60/bushel. Over-estimation of yields by the USDA could indicate STU and prices closer to 2021 or 2022, depending on how many bushels the actual average yield is under the projection. If actual yield exceeds USDA projections, the STU ratio would increase, likely causing prices to fall under $5.60/bushel.

Analysis of soybean yield tells a more exciting story. The USDA is projecting an average soybean yield of 52 bushels/acre, STU of 6.44%, and an average price of $12.90/bushel for 2023. Suppose the average soybean yield is just one bushel short, and harvested soybean acres projections are accurate. In this case, the STU ratio falls to 4.5%, which has not occurred since 2012, when the drought caused supply shortages and soybean prices of $14.40/bushel. Further thinning of soybean yield could push soybean prices closer to 2012 levels.

In conclusion, USDA Ag Outlook Forum projections indicate that the soybean STU ratio is more sensitive to over-projection of yield than corn. These results may show a possible upside to soybean prices if planted and harvested acres are correct, but the average yield is over-projected, or vice versa. USDA planted acre projections will become more accurate as spring planting progresses, giving additional insight into how yield misses could affect STU for corn and soybeans.



Sources:

U.S. Department of Agriculture –Office of the Chief Economist (USDA-OCE). WASDE report. Available on-line at: https://www.usda.gov/oce/commodity/wasde

U.S. Department of Agriculture –Office of the Chief Economist (USDA-OCE). WASDE report. Available on-line at: https://www.usda.gov/oce/ag-outlook-forum/commodity-outlooks

U.S. Department of Agriculture – National Agricultural Statistics Service (USDA-NASS). Quick Stats. Available on-line at: https://quickstats.nass.usda.gov/

**Dr. Grant Gardner**
Assistant Extension Professor
Agricultural Economics
(859) 257-7280
Grant.Gardner@uky.edu

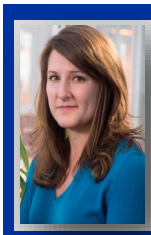
# 2023 Corn and Soybean Fungicide Efficacy Guides Now Available

The 2023 fungicide efficacy tables for foliar diseases of corn and soybean, and for soybean seedling diseases have been updated, and are now available through the Crop Protection Network website: https://cropprotectionnetwork.org/

These tables are updated annually based on data provided by United States Extension plant pathologists, with efficacy determined through replicated research trials across a broad geographic area. Kentucky research trial data are included in the development of these national fungicide efficacy ratings.

The ratings in these guides reflect the efficacy of a fungicide against a given disease, and are not rating yield response to a fungicide. It is an applicators legal responsibility to read and follow label directions. Updated tables include:

- Fungicide Efficacy for Control of Corn Diseases
- Fungicide Efficacy for Control of Soybean Seedling Diseases
- Fungicide Efficacy for Control of Soybean Foliar Diseases



**Dr. Kiersten Wise**
Extension Plant Pathologist
(859) 562-1338
kiersten.wise@uky.edu

**Dr. Carl Bradley**
Extension Plant Pathologist
(859) 562-1306
carl.bradley@uky.edu
@cropdisease

# Drone Sprayer Workshop

Organized by the Kentucky Agriculture Training School and Biosystems and Ag. Engineering, this program is designed for agriculture professionals and producers to learn the newest way to dispense chemicals with drone sprayers. It will be a combination of classroom, hands-on learning and flight demonstrations and will cover sprayer drone costs, nozzle selection, federal rules and more. There are two opportunities to attend: March 27 in Princeton and March 29 in Lexington. The trainings will run from 8:15 until 3:30 pm. Pre-registration is required, and class size is limited. The cost is $105, with lunch included and CCA and pesticide applicator credits offered. Registration for the upcoming Drone Sprayer Workshop will end on 3/23/2023.

To register for Princeton: https://ukdronesprayerprinceton2023.eventbrite.com

To register for Lexington: https://ukdronesprayerlexington2023.eventbrite.com

If you have questions, please contact Josh Jackson (joshjackson@uky.edu 859-218-4339) or Lori Rogers (lori.rogers@uky.edu 270-365-7541 ext 21317)

# UPCOMING EVENTS

| | |
|---|---|
| March 27, 2023 | KATS Drone Sprayer Workshop (Princeton, KY) |
| March 29, 2023 | KATS Drone Sprayer Workshop (Lexington, KY) |
| May 09, 2023 | UK Wheat Field Day |
| May 18, 2023 | KATS Crop Scouting Clinic |
| June 7-8, 2023 | KATS Drone Pilot Certification Prep Course |
| June 29, 2023 | Pest Management Field Day - Princeton (IPM-Grain Crops) |
| July 13, 2023 | KATS Spray Clinic |
| Jul 25, 2023 | UK Corn, Soybean and Tobacco Field Day |

**Cooperative Extension Service**
Agriculture and Natural Resources
Family and Consumer Sciences
4-H Youth Development
Community and Economic Development



LEXINGTON, KY 40546