

**PIONEER PREMIUM SEED & TREATMENTS, CROP INSURANCE, AGRONOMY SERVICES, FIELD DAYS, SEED WHEAT, SEED DELIVERY, & PERSONAL SERVICE**

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## ENSURING SUCCESSFUL SOYBEAN NODULATION IN FIELDS

Soybean planting season is rapidly approaching and many KS producers may be planting into ground that is new to soybean production or that has been out of soybean production for a number of years. The recent increase in soybean acres in KS has brought along, issues and concerns in achieving effective nodulation on ground that has never previously grown soybeans. Fields that do not attain good nodulation likely will not receive adequate nitrogen for growth and there fore will display a lack of vigor, yellowing and low yields.

Functioning nodules on well-nodulated soybeans will provide up to 50-60% or more of the nitrogen needed by the plant. A large percentage of this nitrogen is fixed during the plant's reproductive stages, which is the period of greatest nitrogen demand.

Usually land that has been in recent soybean production will have adequate bradyrhizobium japonicum communities present in the soil to nodulate the soybean roots without applying inoculants. When planting into new soybean ground or ground that has been out of soybean production for many years proper bacterial inoculation is critical.

Other situations where proper inoculation is critical would include conditions where soil pH is less than 5.5 or greater than 8.5, where there was severe drought or flooding since the last soybean crop, where substantial soil erosion has occurred, or when the soil contains less than 1% organic matter.

have proven adequate when planting into new soybean round. Often a 2X rate or combination of different inoculants products is used as added insurance for achieving a good bacterial population near the seedling roots for root colonization. It may take more than one properly inoculated soybean crop before soybean plants nodulate adequately.

Steps can be taken to ensure maximum numbers of viable B. japonicum are present In seed applied bacterial inoculants. These include keeping inoculants in cool dry storage until seed application, ensuring good seed coverage when inoculating, storing inoculated seed in conditions that will minimize bacterial death, and planting inoculated seed within the recommended time period for the inoculant product. The rhizobia are sensitive to lack of moisture. Dry field conditions may contribute to poor nodulation. High residual nitrate levels in soil will inhibit nodule formation. It may be a good idea to use a non-legume crop in those situations.

If soybeans are planted into fields where excessive residual nitrate is suspected, monitor the field and be ready to apply additional N during pod fill if nodulation has been severely inhibited and nitrogen deficiency symptoms appear. When planting into a site that has had no previous soybean history, monitor the field for nodule development on the soybean roots to ensure inoculation was effective. This can be done by digging up plants in different places in your fields.

The company-recommended rate for inoculants often

Continued on Page 3

## CHECK OUT THE WILDCAT AGRI-SERVICES WEBSITE

If you haven't had a chance to visit us on the web at [www.wildcatagriservices.com](http://www.wildcatagriservices.com) it is worth you time to take a few minutes to visit the website. We are constantly updating and improving our site. Highlights include the following pages.

- **HOME PAGE** - You can view the local weather and grain markets from local Co-Op's.
- **PRODUCTS** — Detailed information about Pioneer varieties by crop

- **WHEAT** — Find out about varieties available for sale each year and test plot results
- **YIELD DATA** — View results of local Pioneer test plots
- **RESOURCES** — View articles on various agronomic issues and Pioneer Insights, items for sale, upcoming events, Granular, Tips & Tools, Pioneer TruChoice, company parts catalogs, past newsletters and much more

## SOYBEAN WATER USE

By DAN BERNING PIONEER AGRONOMY MANAGER

### EVAPOTRANSPIRATION (ET)

⇒ More than 60% of total water use occurs during the R1 to R6 reproductive growth stages

### EVAPORATION

⇒ Early in the growing season, water loss from the soil occurs primarily through evaporation from the soil surface.

⇒ Seasonal soybean water use can range from 20-26 inches during the growing season compared to a typical range of 21–28 inches for corn.

⇒ As the crop grows and more leaf area shades the soil, evaporation will decline as transpiration increases.

### SOYBEAN ROOTING DEPTH AND WATER UPTAKE

⇒ Crop residue on the soil surface can significantly reduce the amount of water lost through evaporation by reflecting solar radiation and protecting the soil from wind

GROWTH STAGE	DAILY WATER USE RATE	WATER USE PER STAGE	CUMULATIVE WATER USE
INCHES			
2nd Trifoliolate (V2)	.08	.56	1.00
4th Trifoliolate (V4)	.09	.63	2.19
6th Trifoliolate (V6)	.14	.98	3.17
Beginning Bloom (R1)	.20	2.0	5.17
Full Bloom (R2)	.25	1.75	6.92
Early Pod Development (R3)	.28	1.96	8.88
Pod Elongation (R4)	.32	3.20	12.08
Early Pod Fill (R5)	.33	3.30	15.38
Mid Pod Fill	.32	3.20	18.58
Full Pod (R6)	.25	1.75	20.33
Lower Leaves Yellowing (R7)	.15	1.50	21.83
Maturity (R8)	.10	1.0	22.83

⇒ Well developed root systems are essential for soybean water uptake and growth

⇒ Soybean root systems that are unimpeded by soil factors can reach a maximum depth of more than 60 inches, similar to that of corn

⇒ The majority of soil water uptake by soybeans occurs within the top two to three feet of the soil profile

### IMPACT OF WATER AVAILABILITY

⇒ Soybeans can typically withstand moderate drought stress during vegetative growth with little effect on yield

⇒ Excessive rainfall during vegetative stages can cause the plants to put on more vegetative growth that will not necessarily lead to higher yields. Larger plants can be more susceptible to lodging during thunderstorms later in the season.

### TRANSPIRATION

⇒ In the process of transpiration, plants take up water from the soil and transport it to the leaves. Small openings in the leaves (stomata) allow water vapor to pass from the plant into the atmosphere, cooling the plant.

⇒ The rate of transpiration increases with higher air temperature, solar radiation, and wind speed.

⇒ High humidity levels reduce transpiration by decreasing the difference in water potential between the leaf airspace and the ambient air.

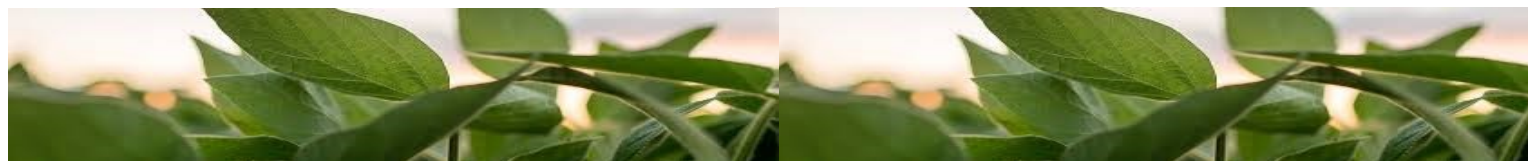
### SOYBEAN WATER USE OVER HE GROWING SEASON

⇒ Daily ET varies greatly throughout the growing season due to day-to-day variability in weather conditions.

⇒ Adequate water is most critical to soybeans during pod development and seed fill.

⇒ On average, daily ET increases through the vegetative growth stages, peaks curing early pod fill, and declines as the crop approaches maturity.

⇒ Ample water during flowering followed by drought stress during seed fill will result in smaller seeds.



## ENSURING SUCCESSFUL SOYBEAN NODULATION IN FIELDS CONT.

For adequate nodulation there should be 8-15 functioning nodules per plant by approximately 40 days after emergence. Healthy functioning nodules will appear pink on the inside when split open. If there is a field that has failed to nodulate a rescue nitrogen fertilizer application will most likely be profitable.

## HAVE SOMETHING TO SELL?

IF YOU WANT TO ADVERTISE FARM EQUIPMENT OR FARM RELATED ITEMS YOU MAY DO SO FREE OF CHARGE. DEADLINE IS THE LAST DAY OF EACH MONTH. SEND YOUR AD TO

SUSANNAH.MCGINN@PLANTPIONEER.COM



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**PRECISION PLANTING PARTS**—Call Mike for pricing on parts. 316-772-7171

# ACHIEVING 100 BU/ACRE YIELDS IN SOYBEANS

By MARK JESCHKE Ph. D. AGRONOMY MANAGER

## INCREASING YIELDS IN SOYBEANS

- Improvements in genetics and management have driven substantial gains in soybean yields in the US over the past 50 yrs. at a rate of .48 bu/acre/year
- US average soybean yields topped 50 bu/acre for the first time in 2016.
- 100 bu/acre has often served as a target yield level for farmers wanting to see how high they can push yields with optimized management and the newest genetics.
- Across all the on-farm genetic and agronomic trials Pioneer conducts each year it has not been unusual for a few entries each year to top 100 bu/acre
- Beginning in 2018 however, the number of plots exceeding 100 bu/acre increased dramatically.

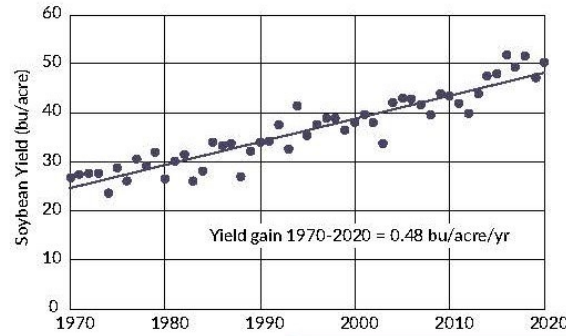


Figure 1. U.S. average soybean yields 1970-2020 (USDA-NASS).

## PIONEER ON-FARM TRIAL RESULTS

- A total of 115 on-farm soybean trial entries exceeded 100 bu/acre in 2020, 107 of which were planted to A-Series soybean varieties.
- 100 bu/acre was achieved with 40 different Pioneer brand varieties from maturity group 1.8 to 4.8. Yields greater than 100 bu/acre were achieved over a relatively wide geography from 2013-2018.

## AGRONOMIC PRACTICES FOR SOYBEANS

- 100 bu/acre yields were achieved in several different environments and with a range of different agronomic practices
- Analyses of management practices used in yield contest winners in other crops have produced similar findings. Indicating that there is no single one-size-fits-all formula for achieving high yield potential

## PREVIOUS CROP

- The vast majority of 100 bu/acre plots(92%) were planted to corn the prior season, while 4% were planted to soybeans.

## TILLAGE

- The most common tillage system used at locations with 100 bu/acre plots was conventional tillage, followed by no-till

## SEEDING RATE

- Seeding rates used in plots yielding above 100 bu/acre ranged from 110,000 seeds/acre to 225,000 seeds/acre
- Average seeding rate was slightly higher among no-till locations (156,000 seeds/acre) than conventional till locations (149,000 seeds/acre)

- Seeding rates differed among the four states with the most 100 bu/acre plots
- The average seeding rate across Kansas and Nebraska locations was 166,000 seeds./acre

## ROW SPACING

- The most common row spacing of 100 bu/acre plots was 30 in rows, followed by 15 inch rows
- Geographic distribution of row spacing practices roughly corresponded with findings of recent USDA surveys, with 30 in rows most common from Illinois west and narrower rows more common from Indiana east.

## PLANTING DATE

- Recent research has shown the importance of early planting for maximizing soybean yields. Most trial locations with 100 bu/acre plots were planted in the latter half of April through the first half of May.

## OTHER PRACTICES

- Other management practices employed at locations with 100 bu/acre plots included foliar fungicides, foliar insecticides, and supplemental nitrogen applications



## 2022 WHEAT TEST PLOT

BRAND	VARIETY
Kansas Wheat Alliance	Zenda
Kansas Wheat Alliance	Ahearn
Syngenta	Monument
Polansky Seed	Rock Star
Oklahoma Genetics	Double Stop
Limagrain Cereal Seeds	Atomic
Limagrain Cereal Seeds	Steel
Limagrain Cereal Seeds	Julep
Limagrain Cereal Seeds	Valiant
Limagrain Cereal Seeds	Photon
WestBred	XE4101
WestBred	XE4105
WestBred	4269
WestBred	4401
WestBred	4699
Kansas Wheat Alliance	Zenda

The wheat test plot is growing well. This year it is located south of the town of Sedgwick on Ridge Road.

You are welcome to stop and walk the plot any time you would like. The varieties planted this year are listed here on the left.

If you have any questions about the various varieties just give Tanner, Corey, Tye, or Mike a call.



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**CROP DOCTORATE: CORN PLANTING DEPTH**

Type this into the search bar to find it. More videos can be seen @ Pioneer Seeds.

## Contact Information

### PIONEER & WHEAT SEED

Korey Carmichael 316-641-3160  
korey.carmichael@plantpioneer.com

TYE ENGEL 316-217-6253  
tye.engel@plantpioneer.com

MIKE MCGINN 316-772-7171  
mikemcginn@plantpioneer.com

TANNER GATZ 316-284-1597  
TGATZ4@gmail.com

**Insurance**  
STEVE MCGINN 316-284-1935  
mcginnst@hotmail.com

**BILLING QUESTIONS**  
SUSANNAH MCGINN OFF. 316-772-5050  
susannah.mcginn@plantpioneer.com

## 2022 PIONEER ® REPLANT POLICY

The 2022 Pioneer replant policy again this year follows the Infinity Program levels on your Pioneer seed invoice. The amount of replant % that one qualifies for depends upon the level of Infinity discounts on your 2022 invoice.

**21-25% Infinity Discount/Platinum Level**—100% of your replant seed cost is paid for by Pioneer.

**16-20% Infinity Discount/Gold Level**—75% of your replant seed cost is paid for by Pioneer

**0-15% Infinity Discount/Silver Level**—50% of your replant seed cost is paid for by Pioneer

## WILDCAT AGRI-SERVICES SUMMER INTERN

New this year will be the addition of an internship position to Wildcat Agri-Services. She will be making visits to every operation this summer introducing herself and checking to see how things are going.

*“My name is Josie Engel and I am currently a student at Oklahoma State University. I am an Ag student studying Animal Science. I’m involved in many clubs on campus and hold a director position in my sorority. Halstead, KS. Is home to me and I look forward to coming back for the summer and working with Wildcat Agri-Services!”*

