WILDCAT AGRI-SERVICES

Volume 25 Issue 2
February 2022

Pioneer Premium Seed & Treatments, Crop Insurance, Agronomy Services, Field Days, Seed Wheat, Seed Delivery, & Personal Service

Inside this issue:

QROME®

PIONEER® PROTECTOR® SUGARCANE APHID

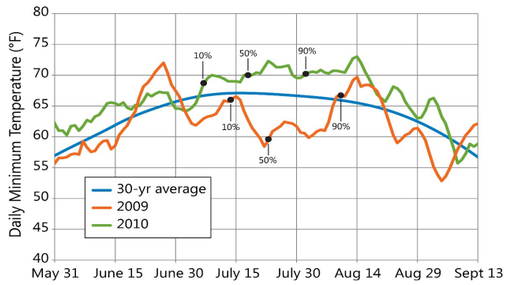
Reduction in Corn Yield Due to High Night Temperatures

Night Temperatures and Corn Yield

- Corn producers are generally aware that high night temperatures can be detrimental to yield; however, the effects on specific plant processes and yield components are not as well understood.
- Corn originated in the Central Highlands of Mexico and adapted during its evolution to the predominant climatic conditions of this region, consisting of warm days and cool nights.
- Research has shown that above-average night temperatures during reproductive growth can reduce corn yield both through reduced kernel number and kernel weight. Yield Reductions from Warm Nights

Yield Reductions from Warm Nights

- In 2009, many farmers in the Midwestern United States produced record corn grain yields. However, in 2010, even with adequate rainfall, corn grain yields were much lower.
- A notable difference between these two growing seasons was night temperatures following pollination.
- The average minimum night temperatures during July and August of 2009 were about 5-8 ºF lower than the average minimum night temperatures in 2010.



- The first experimental evidence that high night temperatures can have a detrimental effect on corn yield came from an experiment performed at the University of Illinois.
- Corn grown with an average night temperature of 85ºF yielded 40% less grain than corn grown with

Pioneer 2022 Infinity

For 2022 Pioneer is continuing the three levels of the Infinity Program from last year. They are Platinum, Gold, and Silver. Benefits and qualifications for each are listed. It's not too early to start planning for 2022.

Silver Level

Qualifiers
Invoice & Payment by Feb. 25th 2022

Benefits
50% Replant
Financing: Prime –1 @ 12% discount

Pioneer Agronomy Crop Shop February 10th 2022

This years Pioneer Agronomy Crop Shop will be held on Feb. 10, 2022 at Pottorf Hall – Cico Park Manhattan, KS

8:30 Registration Opens

9:00 Hybrid Improvements through Advance Corn Breeding – Travis Lee

9:30 Factors Affecting Corn Ear Development – Dan Berning

10:00 Herbicide Decisions for 2022 – Dr. Sarah Lancaster

10:30 Break

10:45 Corn Silage Essentials – Dr. Bill Mahanna

11:30 Agronomy "Quick Hits" – Pioneer Field Agronomists

12:00 Lunch

Please join us to gain insights for the upcoming growing season and beyond! We have a full lineup of exceptional guest speakers covering topics including herbicide decisions for 2022, factors affecting corn ear development, hybrid improvements through advanced breeding, corn silage essentials, and current agronomic issues.

Registration will open at 8:30 with a catered lunch at noon.

Please RSVP ASAP with your local Pioneer Seed Sales Agency or call/text Ron Gehl at 785-410-5448.

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

1200 Feet of gated 8" PVC pipe. 620-386-0569

Berkeley 8X6 pump w/trailer. $1000. 316-772-0147

Western Land Roller Tailwater Pump. 3 phase motor 5 HP. 316-650-2678

Irrigation gear head 6-5 ratio. 620-386-0569

Precision Planting parts—Call Mike for pricing on parts. 316-772-7171

FOR SALE!

Soybean Water Use

Evapotranspiration

Evaportion

- Early In the growing season, water loss from the soil occurs primarily through evaporation from the soil surface
- As the crop grows and more leaf area shades the soil evaporation will decline as transpiration increases
- 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

Transpiration

- In the process of transition, 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 an ambient air.

Soyben Water Use Over the Growing Season

- Daily ET varies greatly throughout the growing season due to day-to-day variability in weather conditions.
- On average, daily ET increases through the vegetative growth stages, peaks during early pod fill, and declines as the crop approaches maturity.
- More than 60% of total water use occurs during the R1 to R6 reproductive growth stages
- Seasonal soybean water use can range from 20-26 inches during the growing season compared to atypical range of 21-28 inches for corn.

Soybean Rooting Depth and Water Uptake

- 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 growth 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
- Adequate water is most critical to soybeans during pod development and seed fill
- Ample water during flowering followed by drought stress during seed fill will result in small seeds.

Growth Stage	Daily Water Use Rate	Water Use Per Stage	Cumulative Water Use
	Inches		
2nd Trifoliate	.08	.56	1
4th Trifoliate	.09	.63	2.19
6th Trifoliate	.14	.98	3.17
Beginning	.20	2.00	5.17
Full Bloom (R2)	.25	1.75	6.92
Early Pod De-	.28	1.96	8.88
Pod Elongation	.32	3.20	12.08
Early Pod Fill	.33	3.30	15.38
Mid Pod Fill	.32	3.20	18.58
Full Pod (R6)	.25	1.75	20.33
Lower Leaves	.15	1.50	21.83
Maturity (R8)	.10	1.00	22.83

Upcoming Ag Meetings and Schools

Women Managing the Farm Conference—Feb 9th-11th

email to register robinreid@ksu.edu or 785-532-0964

Reduction in Corn Yield continued

an average night temperature of 62 ºF

Further Research on Temperature Effects

- Research has shown a reduction in kernel number associated with high night temperatures (Cantarero et al. 1999).
- Results showed that kernel abortion in heated night plots was 8% higher than in the control plots. Ears in the heated plots had an average of 34 kernels per row at harvest, compared to 37 kernels per row in the control plots.
- A study by Badu-Apraku et al. (1983) examined the effect of temperature on grain fill after kernel number had already been set.

Day/Night Temp.	Grain Fill Duration	Grain Wt Per Plant	Kernel Number
°F	Days	Ounce	
77/59	39 a	4.4 a	550 a
77/77	31 b	3.6 b	580 a
95/59	24 c	2.5 c	593 a
95/77	21 d	2.4 c	606 a

- Results showed that grain yield per plant was significantly affected by temperature regime (Table 2).

Why Do Warm Nights Reduce Yield?

- Current research supports two hypotheses that may explain why higher temperatures during the grain filling period reduce grain yield:
  - ⇒ Higher rate of cellular respiration.
  - ⇒ Accelerated phenological development.

Higher Rate of Respiration

- The most commonly cited explanation for the detrimental effect of high night temperatures on corn yield is increased expenditure of energy due to a higher rate of cellular respiration at night.
  - ⇒ Cellular respiration consumes carbon assimilated through photosynthesis to maintain and increase plant biomass.
  - ⇒ Higher temperatures produce faster rates of cellular respiration in a corn plant, making less sugar available for deposition as starch in the kernels.
  - ⇒ A lower rate of respiration relative to photosynthesis has generally been viewed as favorable for maximizing agricultural productivity and grain yield.
- Although higher night temperatures undoubtedly increase the rate of respiration in corn, research generally suggests that higher rates of night respiration probably do not have a large impact on corn yield.
  - ⇒ In a study that examined the effects of elevated night temperature, night respiration in plant leaves did not significantly differ between heated and control plots (Cantarero et al., 1999).
  - ⇒ In another study, respiration rates were found to be high for newly emerged plants but declined as plants developed (Quin, 1981). Researchers concluded that increased respiration rates associated with high night temperatures likely did not have a major impact on corn yield.

Accelerated Phenological Development

- Elevated night temperatures reduce the time required for corn plants to reach physiological maturity.
- Shortening the length of time between silk emergence and maturity reduces the number of days that the corn plant is engaged in photosynthesis during grain fill, effectively reducing the amount of energy the corn plant can convert into grain yield.
- Following the 2010 growing season, Iowa State University researchers used the Hybrid-Maize model to explore the effects of night temperature on length of grain fill (Elmore, 2010).
- The model compared predicted days to maturity based on actual 2010 temperatures vs. daily minimum temperatures from July 15 to Aug 15 replaced with those from the 2009 growing season (labeled as Tmin Alt in Table 3).
- Results showed that lower night temperatures during the month-long period following silking extended grain fill by a week or more.
- Research conducted by Badu-Apraku et al. (1983) provides further evidence that shortening the days from silk emergence to physiological maturity reduces grain yield.
- Results showed that duration of the grain fill period and grain yield per plant were both significantly affected by temperature (Table 2).
- Research generally shows that accelerated phenological development is likely the primary mechanism by which high night temperatures can negatively affect corn yield.

ISU Research Farm	Year	Days in Reproductive Stages	Total Days to Maturity
Sutherland	2010	61	131
Sutherland	2010 T Alt	72	144
Nashua	2010	55	122
Nashua	2010 T Alt	63	130
Ames	2010	50	115
Ames	2010 T Alt	59	124
Lewis	2010	50	115
Lewis	2010 T Alt	58	123
Crawfordsville	2010	20	114
Crawfordsville	2010 T Alt	57	120

Ag Risk Management

Crop Insurance today offers...Lots of choices, if you want a crop insurance agent that can help you make choices from a farmers perspective contact
Steve McGinn 316-284-1935

Follow Pioneer on Twitter
@KSUHILL (Gary Hill Pioneer Account Manager)
@pioneerKansas
@Pioneerseeds

PIONEER® WILDCAT AGRI-SERVICES
1123 West 4th Street
Sedgwick, KS. 67135

STANDARD
U.S. Postage Paid
Sedgwick, KS.
Permit # 14

PIONEER 95 YEARS
Serving American Farmers Since 1926

HAPPY VALENTINE'S DAY

Visit www.wildcatagriservices.com - to learn more about Pioneer Products!

YouTube 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

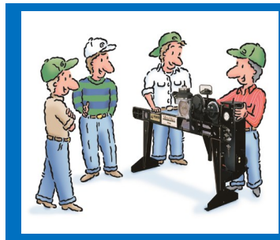
Tye Engel 316-217-6253
tye.engel@plantpioneer.com

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



Get your meters calibrated and repaired. We have a planter test stand for checking the accuracy of vacuum, finger pickup, and Kinze brush meter units.

This is something that we suggest should be done on a planter at least every other year. Contact Mike, Tye, or Korey for details and to schedule your test. We would really like to do these this winter instead during the spring rush

Pricing is $25/row before March 1st and /$30/row after March 1st.

TruChoice Discounts for 2022

—Pioneer Infinity Platinum and Gold level customers who prepay for approved Corteva Agriscience ™ crop protection products by Feb. 25th 2022 will earn an additional 5% on your Corteva Prepay dollars.

Total savings adds up to 15% cash or 10% credit.

See eligible crop protection products at **TruChoice.Corteva.us**

PrePay Savings Discount	10% Cash or 5% credit	Fund a TruChoice prepay acct by Feb 25th 2022
Plus		
Pioneer Customer Bonus	5% Additional Savings applied upfront to retail invoice	Must reach Infinity Platinum or Gold Level on Pioneer Invoice for 2022