

# Double Cropping Corn and Soybean: Risk or Reward?

---

Michael Plumlee, Ph.D., CCA

Mississippi State Row Crop Short  
Course

Dec. 10<sup>th</sup>, 2024



# Introduction

---

- Over the last several decades input prices (fertilizer, pesticides, fuel, equipment costs, land rent, etc.) have increased
  - Many inputs have drastically increased since COVID-19
- Corn and soybean are often grown in rotation; shared equipment; disease and weed benefits
- Several irrigated fields in SC are continuous corn
- How can we increase per acre profitability on the farm year to year?



# Improving Total Farm Profit

---

- Increase Yield
  - Irrigation?
  - Hope and pray for a “Good” year
- Increase Price
- Reduce inputs or input costs
  - Increase efficiency
  - Are we trading yield or quality for this?
- Increase Production per Acre
  - Intercropping
  - Double-Cropping



**CLEMSON**

CORN & SOYBEAN AGRONOMY

# Double Cropping Corn and Soybean

---

- Double Cropping is not a “new” concept
- Double cropping in SC often involves soybean following small grains
- Double cropping corn and soybean has been conducted in GA for several years with varying levels of success
- Interest from farmers primarily in coastal plain where corn and soybean crops dominate production
  - Good, productive soils
  - Irrigation
  - Aggressive farmer mentality
- Estimated <5,000 acres planted to this system in 2020
- Estimated 20,000+ acres planted to this system in 2023

# Double Cropping Corn and Soybean

---





# Problem/Research Questions

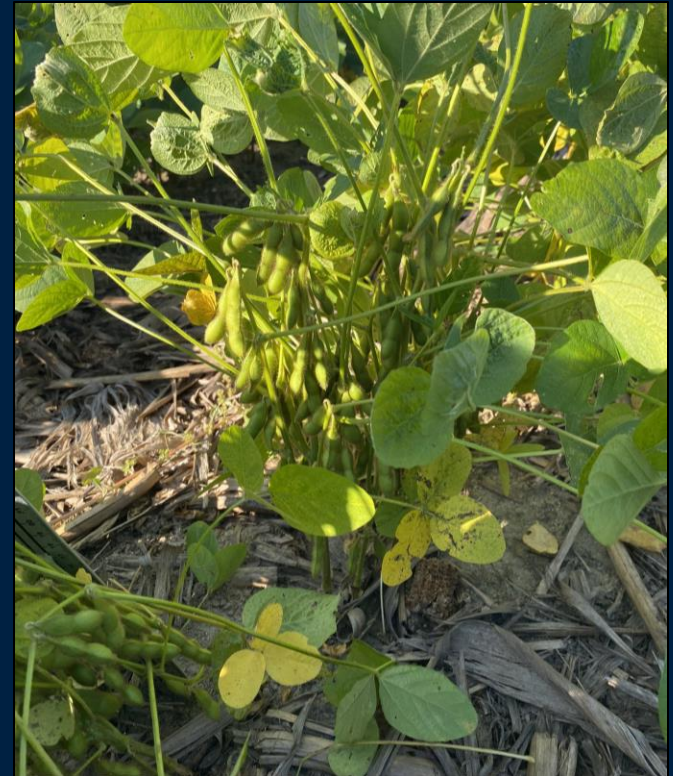
---

- Can we double-crop corn and soybean in South Carolina? Frost?
- Can we do this profitably?
- What is the last day I can plant soybean and make a crop?
- Should I be concerned with plant parasitic nematodes?
- What maturity group soybean should I plant? Corn hybrid?
- Will the use of N at-plant increase yield or plant height?
- Other factors?

# Important Factor – Plant Height

---

- This system needs plant height for harvestability
  - Varietal?
  - Agronomically influenced?
  - Maturity Group?
- How does yield work into this?





# Agronomic Challenges

---





# Agronomic Challenges

---





# Equipment Solutions

---





# Developing BMP's

---

- Five Independent Trials:
  - **Trial 1:** Determining soybean planting date and maturity group effects when double cropped behind corn
  - **Trial 2:** Evaluation of corn and soybean nematicides in double-crop scenarios (Counter 20G & AgLogic15G)
  - **Trial 3:** Evaluation of at-plant nitrogen on ultra-late planted soybean
  - **Trials 4 & 5:** Evaluation of row spacing on ultra-late planted soybean (30-inch rows vs. 15-inch rows) & Seeding Rate

# Evaluating Planting Date and Maturity Group – Trial 1

---

## Soybean Planting Date/MG

- Two corn hybrids
  - 113 and 120 RM
- Two corn planting dates
  - March 15 and April 15
- Harvest at 3 moisture contents
  - 25, 20, and 15.5%
- Followed by 4 soybean maturity groups
  - 4, 5, 6, and 7 MG



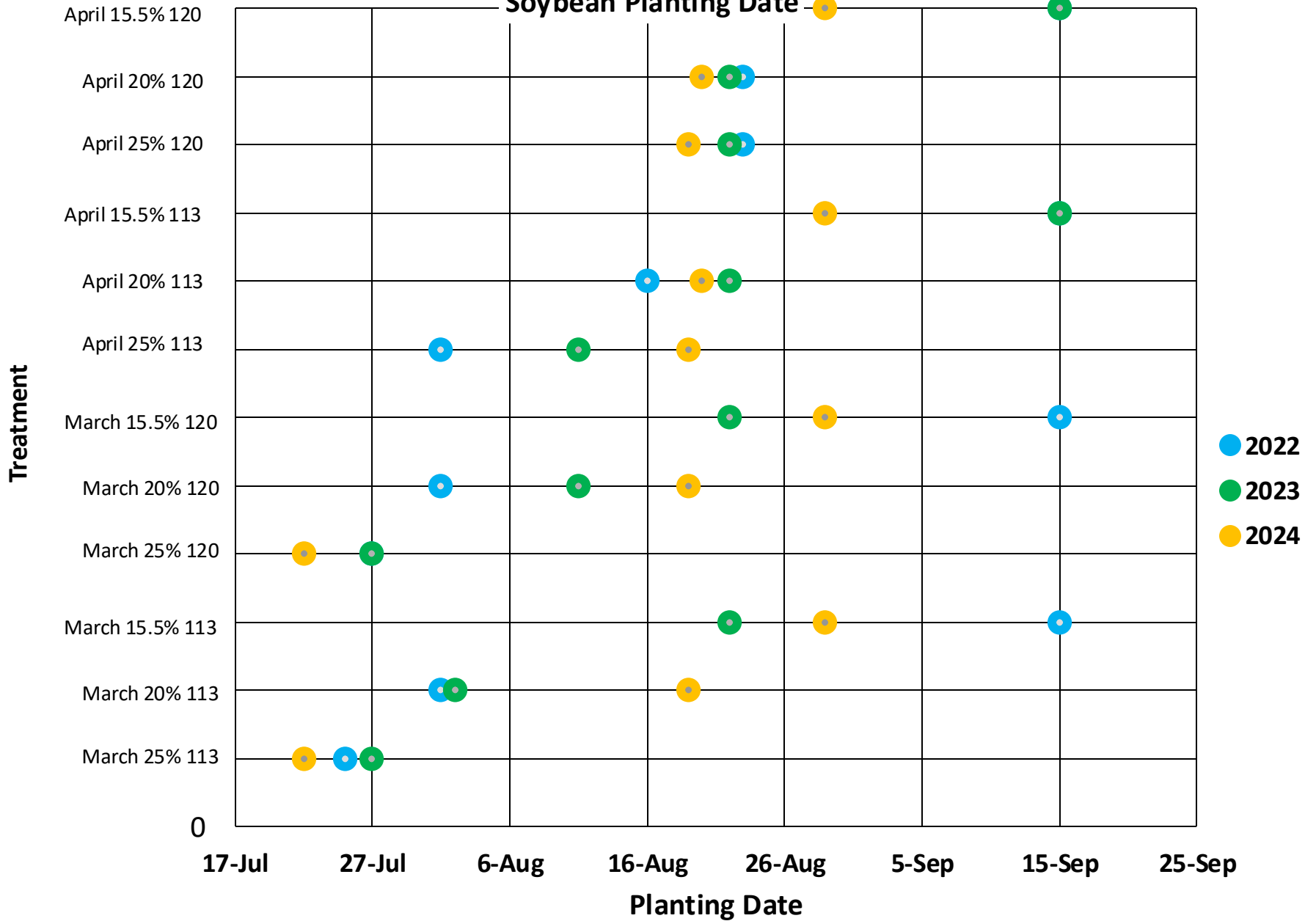


# Evaluating Planting Date and Maturity Group

---

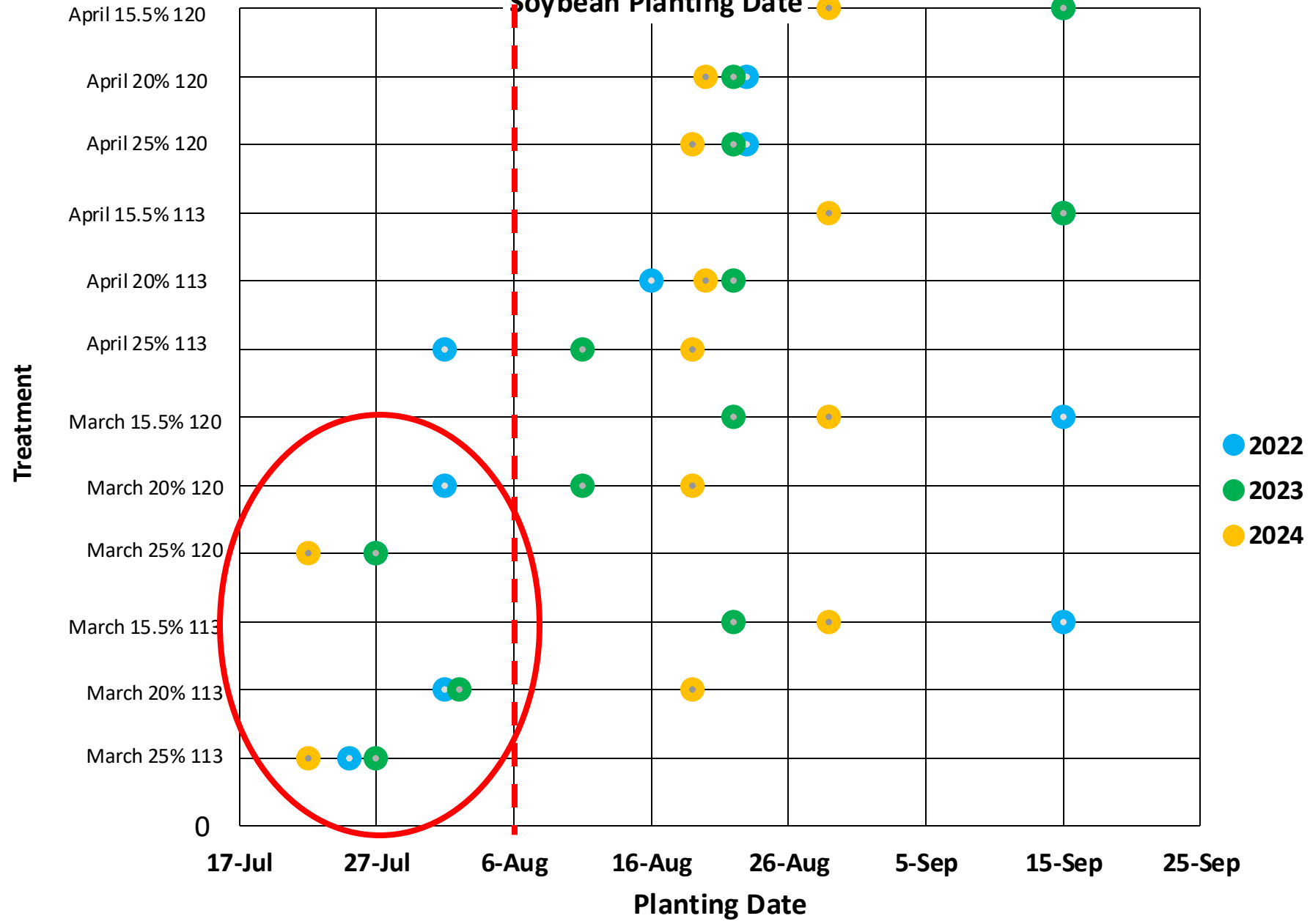


# Soybean Planting Date





# Soybean Planting Date



# How to Achieve Appropriate Soybean PD?

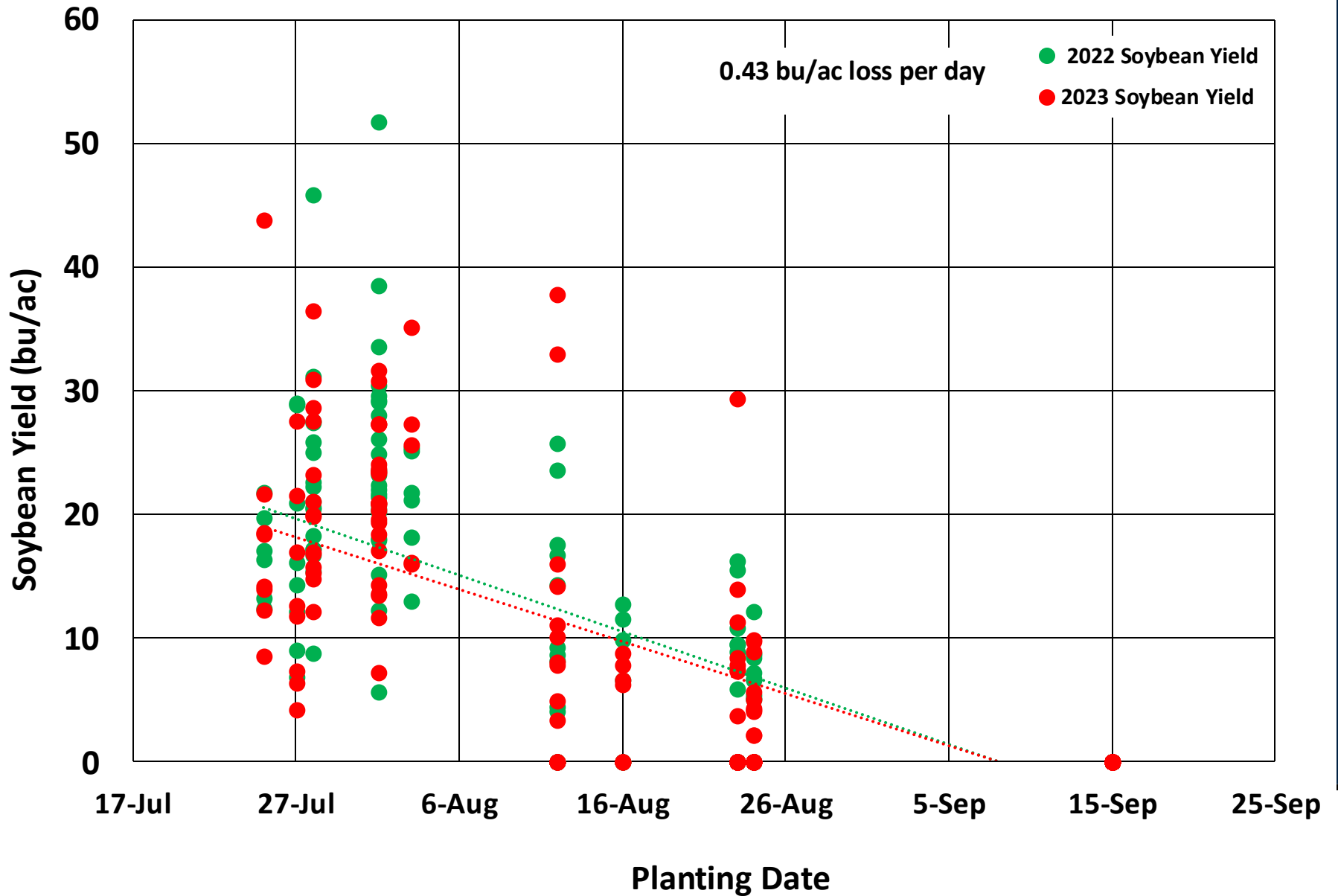
---

- Corn must have a March planting date
  - Heat-driven crop – get in early, expect to harvest earlier
- Understand that corn needs to be harvested at high moisture
  - Grain dryer is a must
  - Drying costs need to be realized upfront
    - Commodity price or drying fuel considerations?
  - Our data suggest that corn harvested at 20% moisture or higher
- Hybrid selection in terms of maturity is flexible
  - Plant full season first or select early hybrid for this system
  - Corn yield is the first and foremost decision!

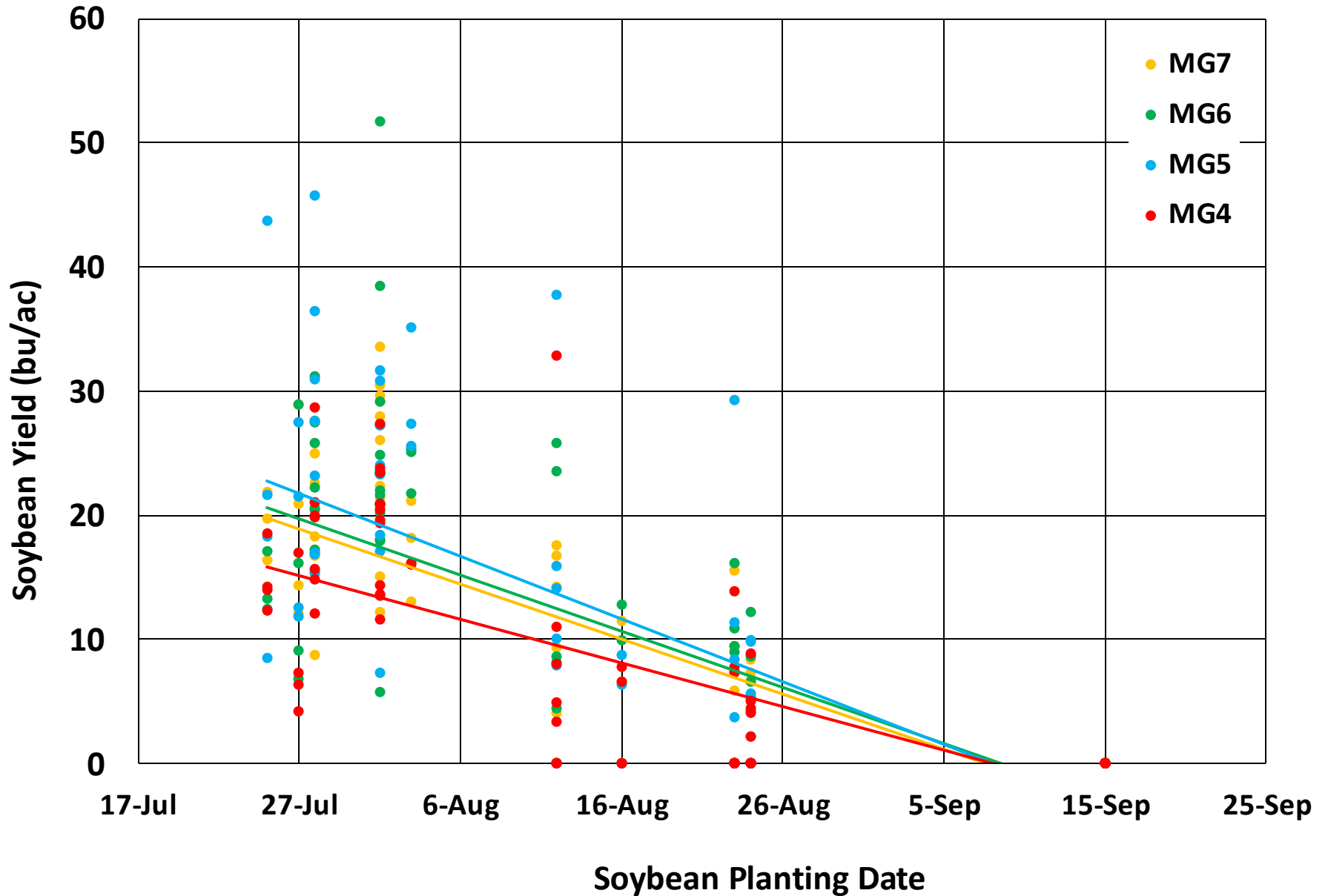




# Soybean Yield by Planting Date



# Soybean Yield by Maturity Group



## Evaluating Planting Date and Maturity Group - Conclusion

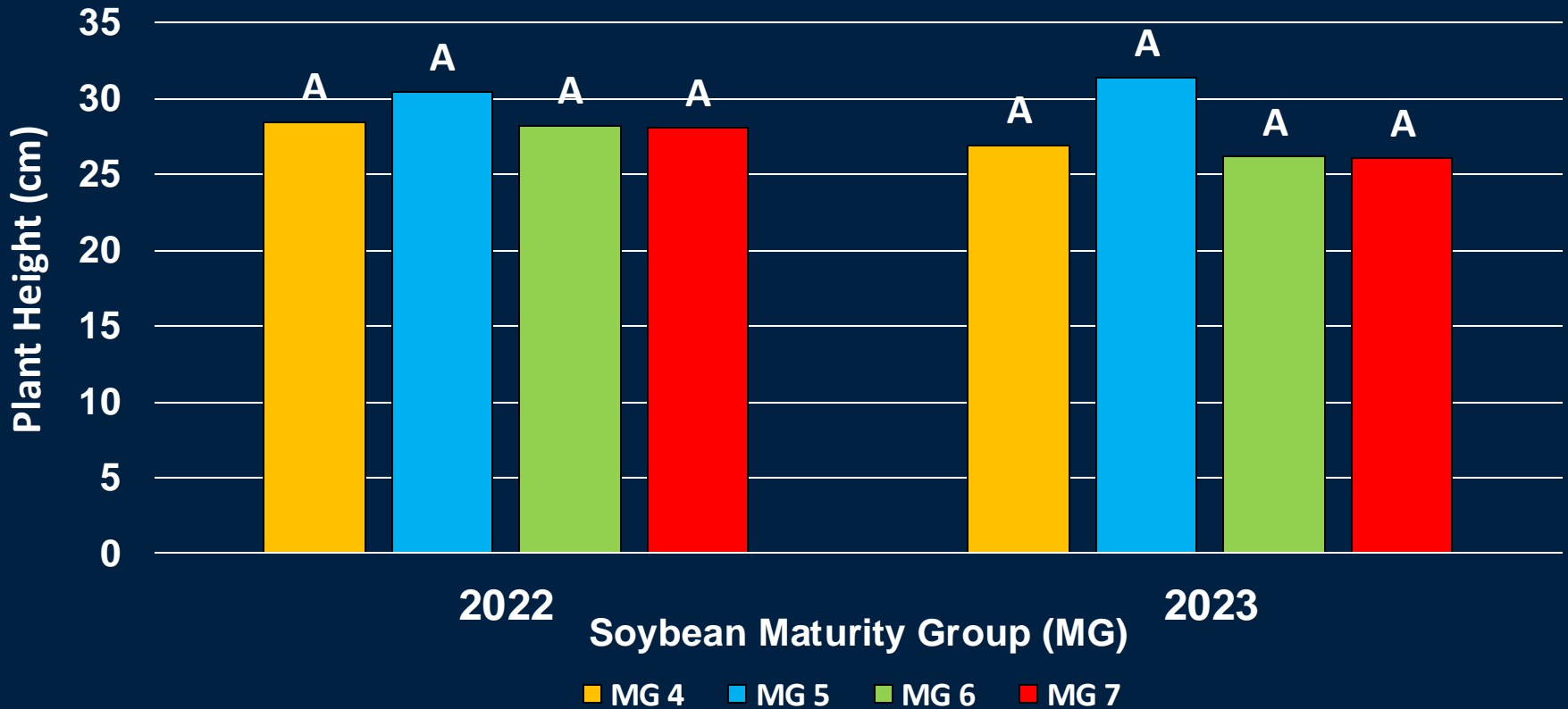
---

- Soybean planting date is highly dependent on corn planting date and harvest moisture
- Flexibility in hybrid selection across years
- Soybean maturity group did influence grain yield at certain planting dates, where the MG 4 underperformed. Varietal?
- Understanding yield potential and yield loss per day will help gauge when to stop planting ~ August 7-10<sup>th</sup>
- What about plant height??



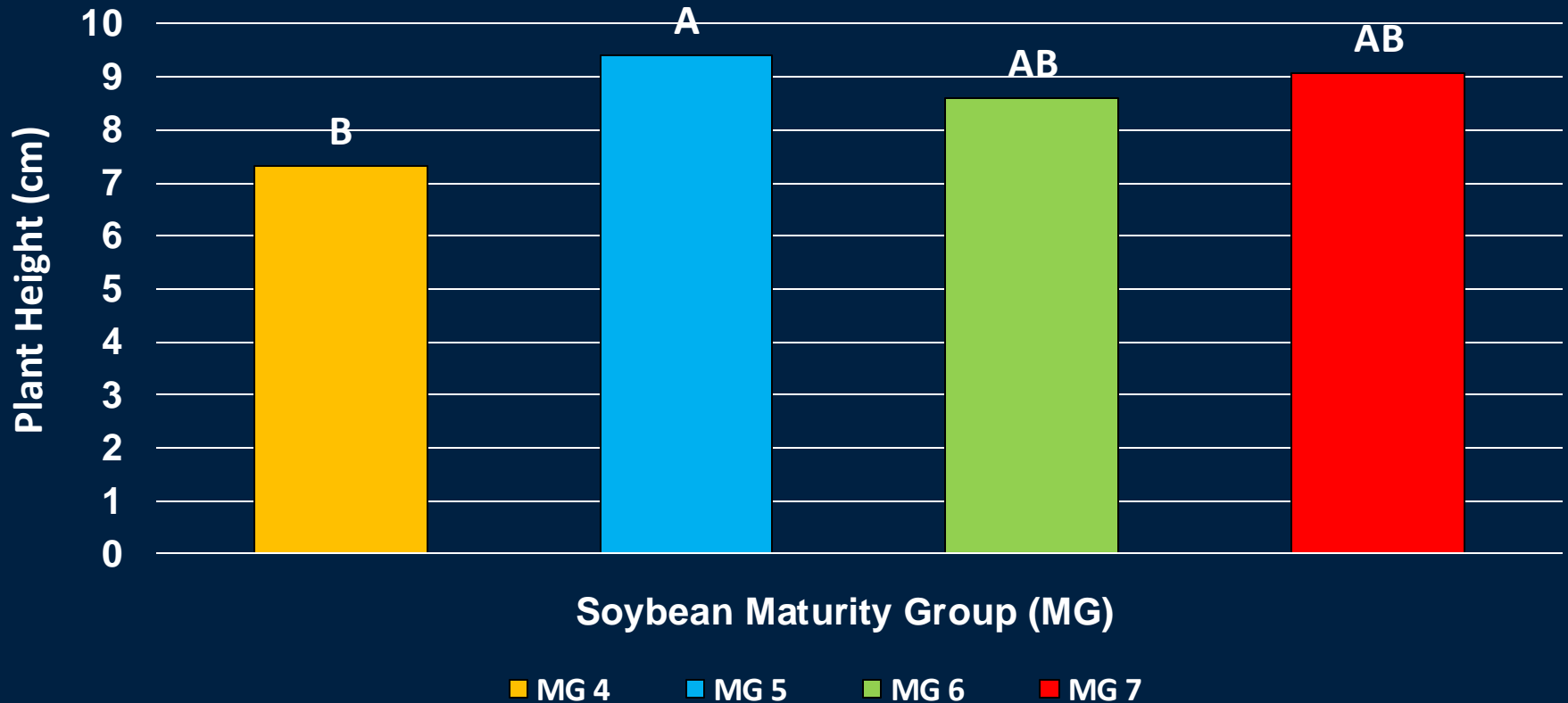
# Maturity Group Effects on Plant Height

## Soybean Plant Height x Maturity Group



# Maturity Group Effects

## Soybean Height to First Fruit x Maturity Group







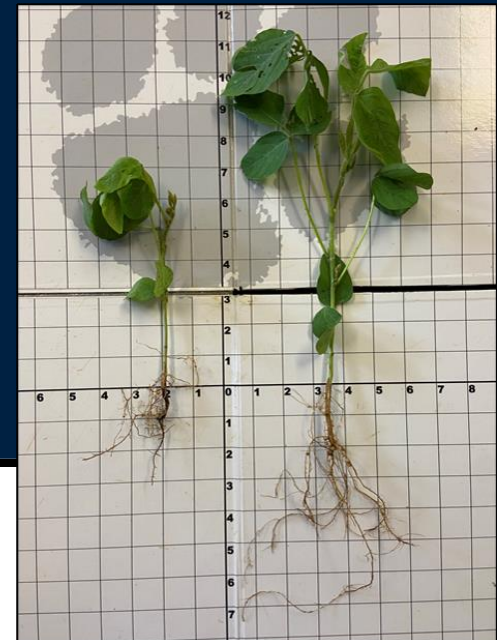


# Should we be concerned with Nematodes?

Species	Corn	Cotton	Soybean	Peanut
Southern Root-knot	300	100	100	Nonhost
Peanut Root-knot	300	Nonhost	100	50+
Soybean cyst	Nonhost	Nonhost	50	Nonhost
Columbia lance	100	75	50	Nonhost
Lesion	500	100+	150	25+
Stubby root	40+	??	50	50+
Ring	200+	400	200	50+
Sting	4	8	4	8+
Reniform	Nonhost	250	100	Nonhost
Spiral	500	800+	600	200

# Nematode – Trial 2

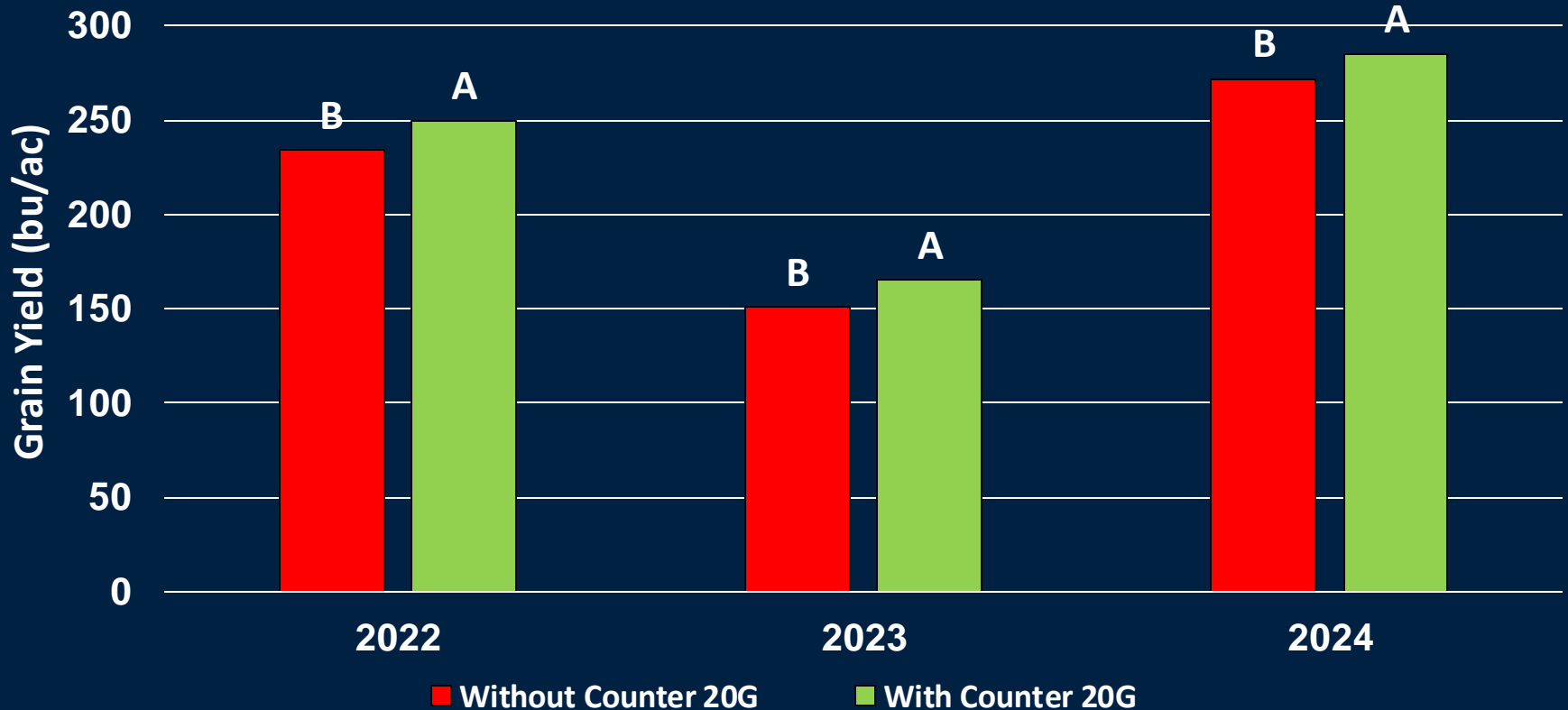
- SRK Nematode is the primary target in this research, however, all species were identified with sampling
- Corn with and without Counter 20G
  - Nematode sampling at plant, V4, and harvest
  - Root sampling at V4
- SRK resistant and susceptible with and without AgLogic 15G
  - Nematode sampling at plant, V4, and harvest
  - Root sampling at V4





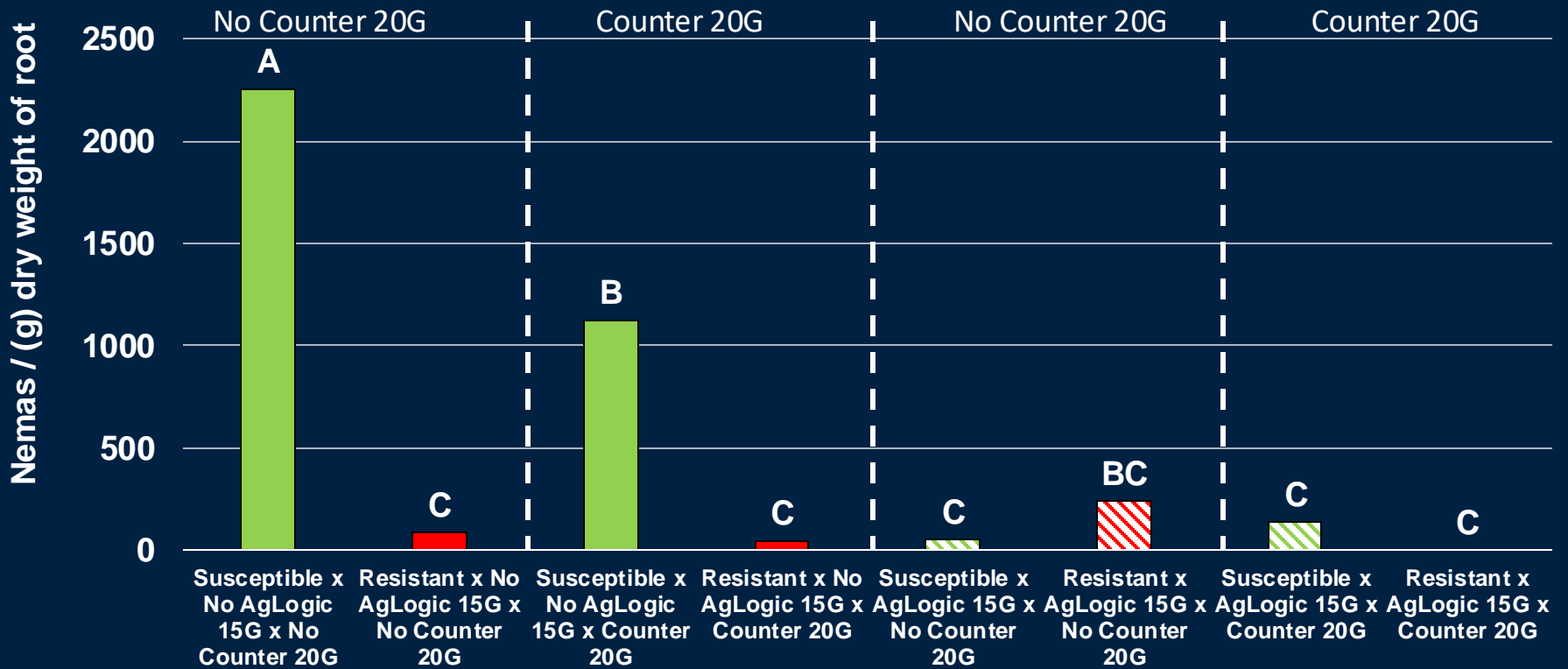
# Nematode - Results

## Corn Grain Yield x Nematicide



# Nematode - Results

2024 Southern Root-Knot Nematode Soybean V4 Root Counts by Nematicides in Corn and Soybean, and Soybean Variety





# Nematode - Conclusion

---

- Counter 20G did impact corn grain yield every year with an on-average increase of 14 bu/ac when Counter 20G was used.
- Counter 20G x AgLogic 15G x SRK resistant soybean variety significantly impacted recovery of SRK nematode from soybean roots
- Combination of nematicide and soybean variety did not impact soybean grain yield
  - Variety alone seemed to have biggest impact

# At-Plant N, Seeding Rate, and Row Spacing - Summary

---

- No significant plant height or yield differences with at-plant N (0-90 lbs/ac)
- No significant differences in seeding rate (120-240k seed/ac) however, numerically 150k seed/ac seemed best
- No yield differences in 30 vs 15-inch row spacing
  - Strip-till?
  - Too late to close canopy?



# Double Cropping Economics - 2024

Revenue		Corn - Irrigated	Soybean - Irrigated	DC Corn - Irrigated	DC Soybean - Irrigated
	Projected Yield (bu/ac)	210	65	210	30
	Futures Price	\$4.80	\$9.70	\$4.80	\$9.70
	Expected Crop Revenue	\$1,008.00	\$630.50	\$1,008.00	\$291.00
<b>Direct Expense</b>					
	Seed	\$104.00	\$55.00	\$104.00	\$55.00
	Fertilizer	\$393.52	\$134.02	\$393.52	\$0.00
	Crop Protection	\$95.52	\$128.22	\$95.52	\$50.00
	Crop Insurance	\$8.63	\$6.76	\$8.63	\$0.00
	Drying Cost	\$44.73	\$2.77	\$63.00	\$0.00
	Irrigation Energy	\$54.00	\$27.00	\$54.00	\$27.00
	Labor	\$6.08	\$7.15	\$6.08	\$7.15
	Machinery	\$39.45	\$43.43	\$39.45	\$43.43
	Total Direct Expenses	\$745.93	\$408.99	\$764.20	\$187.22
	Total Profit / Acre	\$262.07	\$221.51	\$243.80	\$103.78
				Total DC Profit / Acre	\$347.58



# BMP's

---

## Understandings:

- Time is critical
- Irrigation is recommended
- Residue management can be a challenge
- Corn must be cut at high moisture and dried



# BMP's

---

## Lessons Learned:

- Corn needs to be planted early (March)
- Some flexibility with RM of corn hybrid
- Corn harvest likely needs to occur between 28-20% MC
- Economic benefit from using Counter 20G??
  
- Pick the best soybean variety for yield and plant height regardless of MG – no benefit in MG 4
- Plant as early as possible through August 7-10th
- ~150k seed/ac on 30-inch rows can achieve max yield

# BMP's

---

## Lessons Learned:

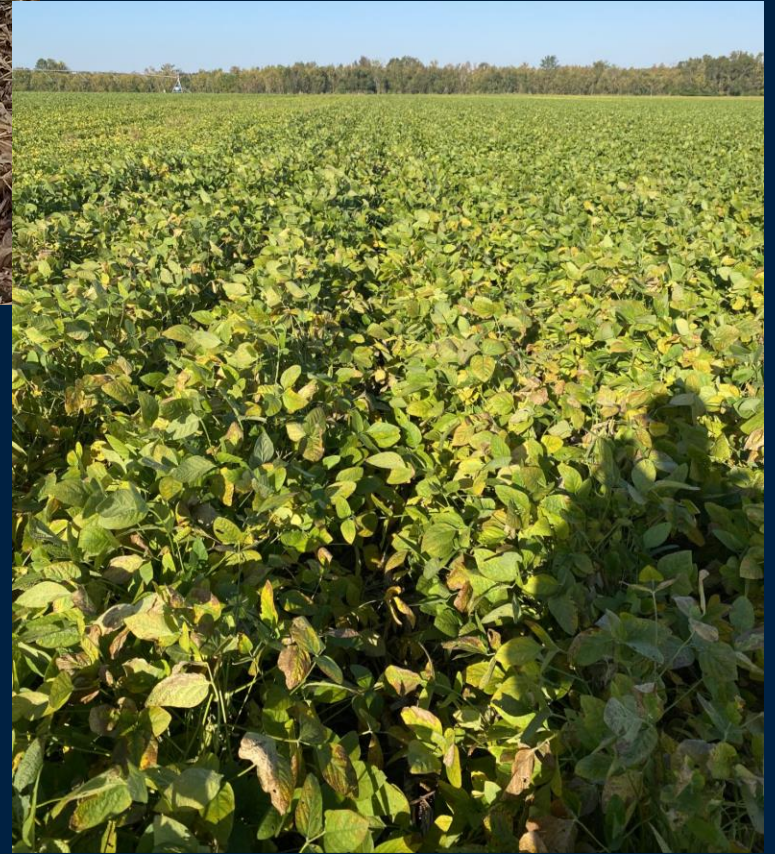
- What happens if early frost?
  - 2022 we had early frost on Oct 16<sup>th</sup>
  - Estimated yield loss 10-15% but not total failure
- What happens if we have an active hurricane season?
  - Less irrigation cost
  - In 2023, we had some issues with excessive water
  - In 2024, planting was impacted by Tropical Storm Debbie

















# Acknowledgements

---



*South Carolina*  
**SOYBEAN BOARD**

# Questions?

**Michael Plumblee**

64 Research Road

Blackville, SC 29803

[mplumb1@clemson.edu](mailto:mplumb1@clemson.edu)

803-269-8922

**CLEMSON**

CORN & SOYBEAN AGRONOMY