

Corn silage hybrid trials 15 years of perspective

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Outline

- What is the variety trial and what the long-term data tells us
- Importance of variety selection
- Effects of heat – how hot is too hot?

This research was partially supported by the extramural research program of the U.S. Department of Agriculture, National Institute of Food and Agriculture [AFRI award number: 2024-68016-41535].



National Institute of Food and Agriculture
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Choosing the right varieties/hybrids for your needs

The UF/IFAS

- Partnership with multiple industries to collect unbiased data to support decisions
- Testing > 150 entries of corn, sorghum x sudan, millet,
 - oat, rye, triticale, wheat, ryegrass
 - Mixed forages, legumes
- Since 2008 -> 1800 entries of sorghum,
- Better genetics = better return



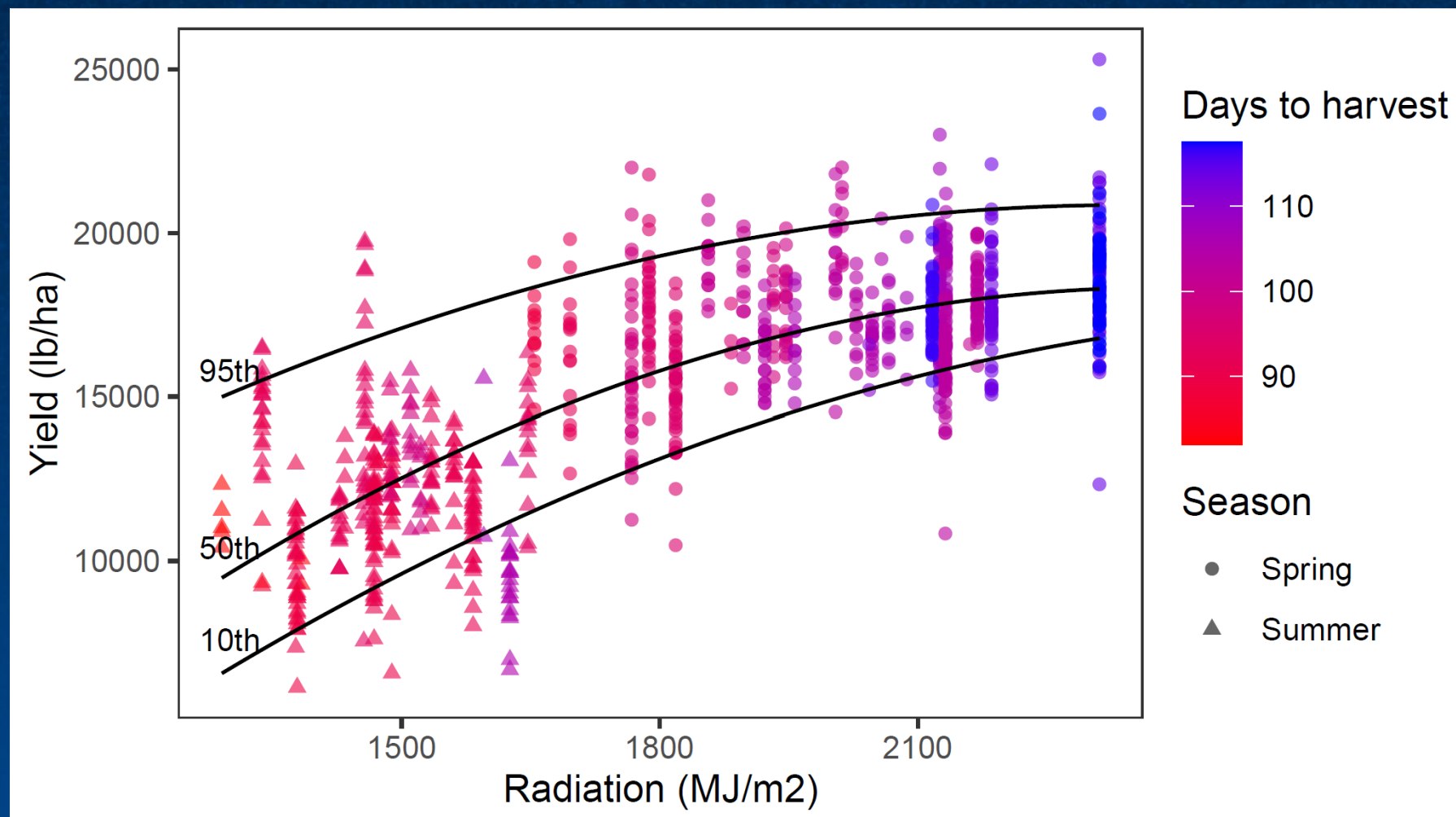
Methods –

- Corn, sorghum and sorghum x sudan
 - Data from 2008 – 2023, one location
 - Biomass, nutritive value, estimated milk production (Milk2006)
 - Two growing seasons per year – spring and summer
- Linear model (*lme4*)
 - Season (spring and summer) and species (corn, sorghum and sorghum x sudan)
 - Hybrids and year as random effects
- Regression Random Forest (ntree = 500) with node purity (mtree=3) to assess climatic effects on production

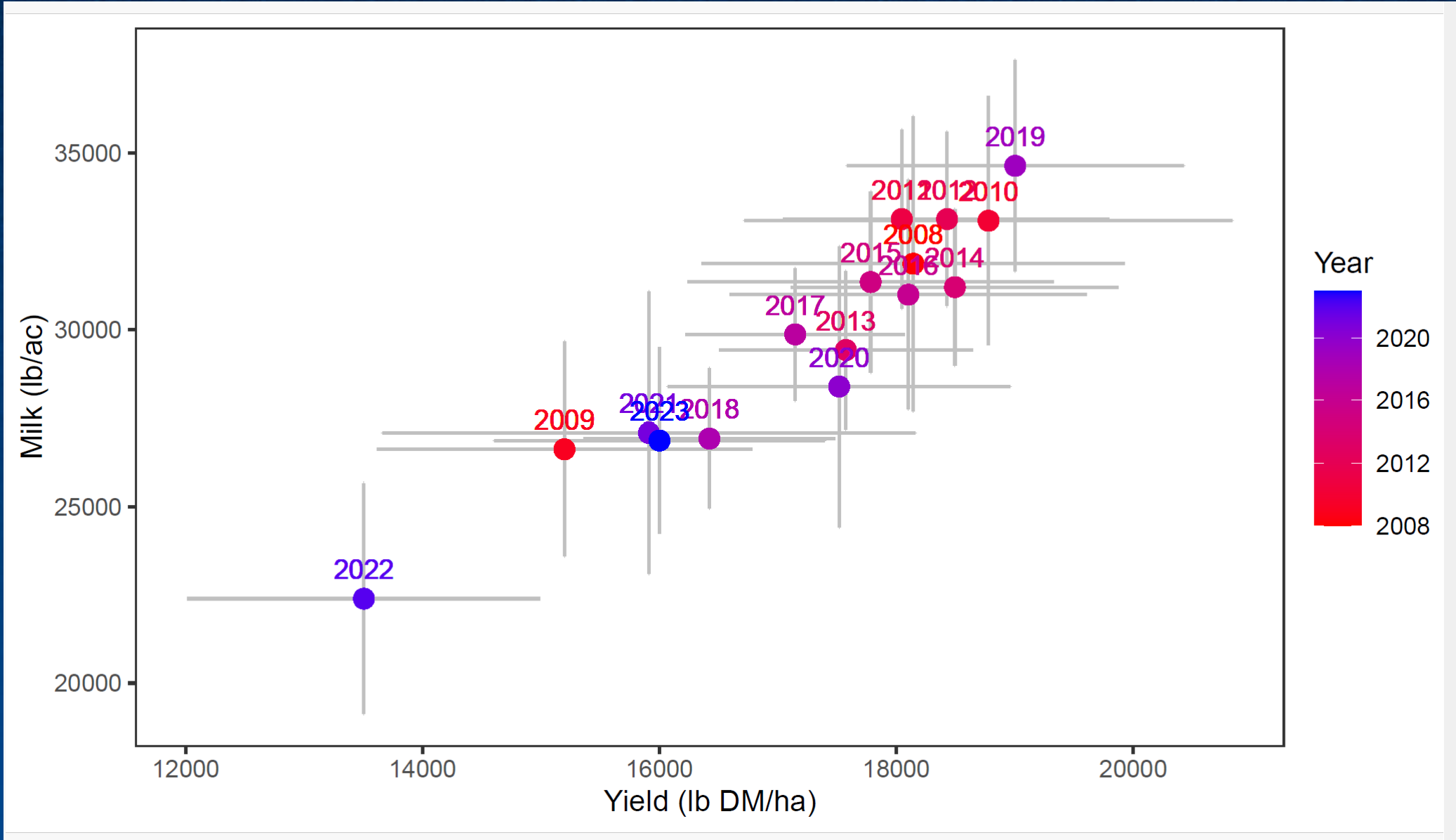
Proper selection of
hybrid:

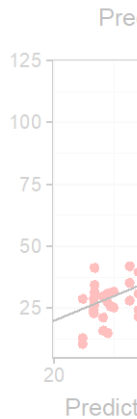
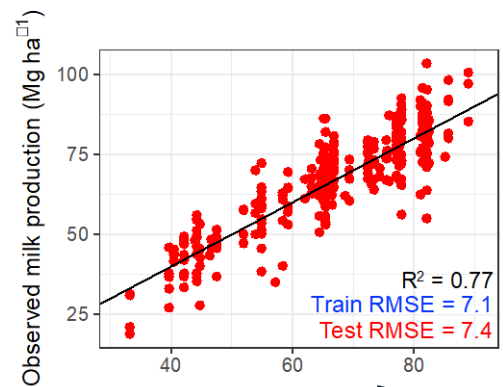
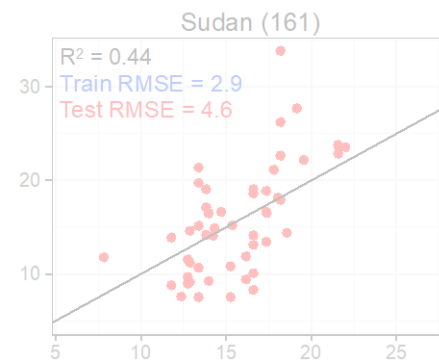
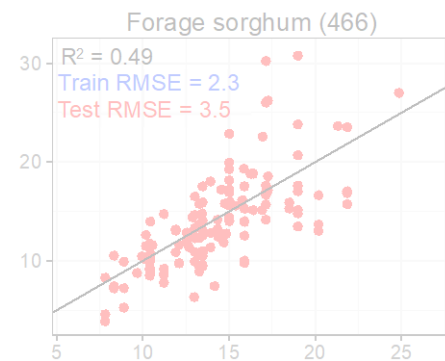
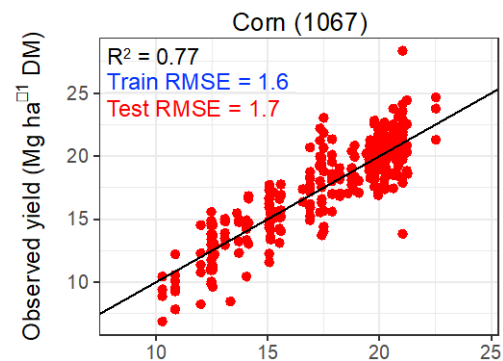
**~15-30% greater
production**

**Length of the
season not as
strongly
correlated to RM**

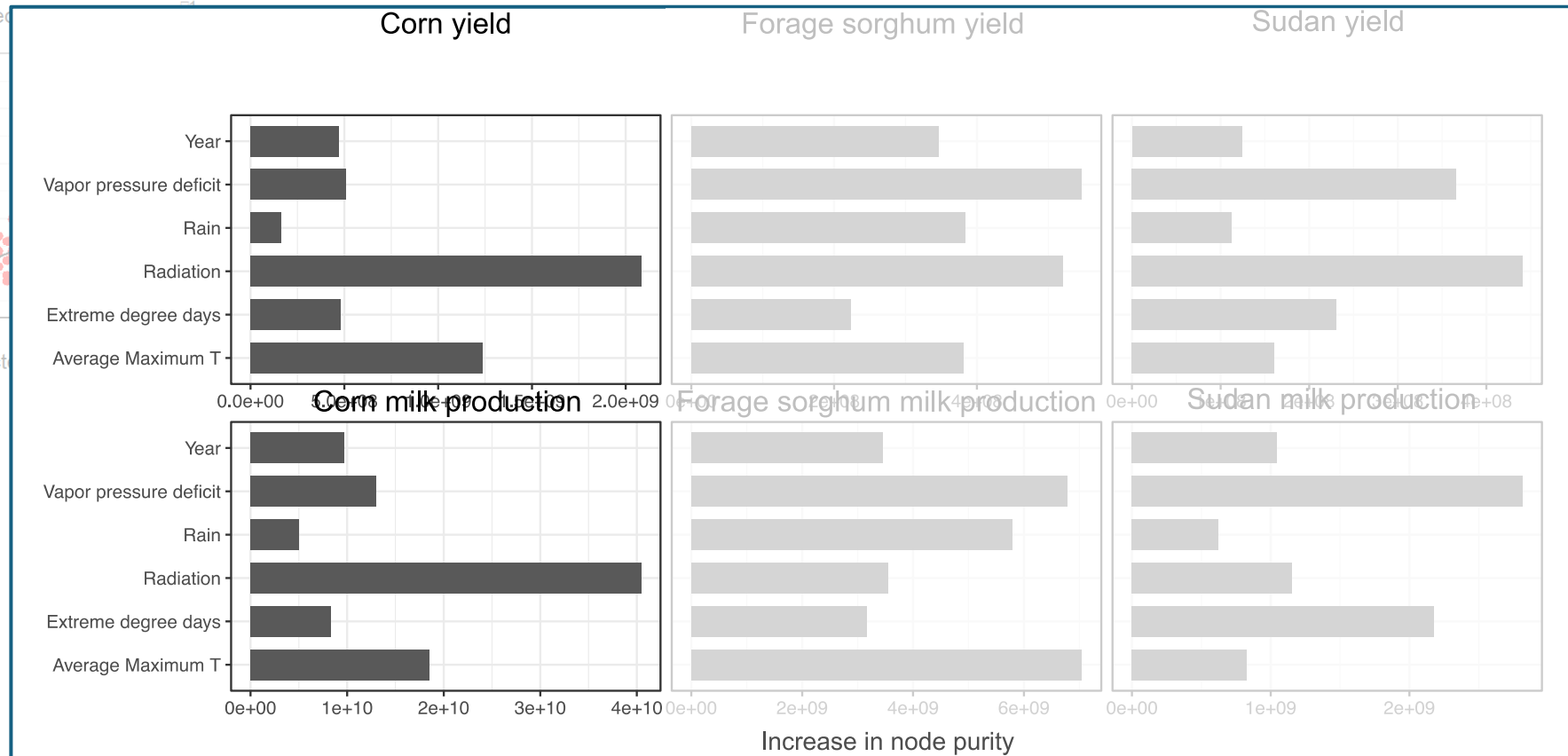


	Corn		Forage sorghum		sorghum x Sudan		
	Spring	Summer	Spring	Summer	Spring	Summer	SE
Yield (Mg ha ⁻¹ DM)	8.6 ^a	5.9 ^d	6.7 ^c	5.7 ^d	7.8 ^b	5.1 ^e	0.4
CP (%)	8.0 ^{ab}	8.2 ^a	7.0 ^c	7.9 ^b	6.8 ^c	7.9 ^{ab}	0.2
NDF (%)	40.8 ^C	40.6 ^C	54.6 ^B	55.1 ^B	61.1 ^A	59.9 ^A	0.8
dNDF (%)	57.7 ^a	52.2 ^b	44.7 ^c	45.7 ^c	44.6 ^c	46.1 ^c	1.1
ADF (%)	23.5 ^d	22.8 ^d	33.7 ^c	34.0 ^c	40.7 ^a	38.0 ^b	0.6
Starch (%)	35.0 ^A	33.6 ^A	17.3 ^B	15.6 ^B	13.0 ^C	9.9 ^C	0.9
NE _l (MCal kg ⁻¹ DM)	1.61 ^a	1.56 ^b	1.41 ^c	1.42 ^c	1.26 ^d	1.28 ^d	0
TDN (%)	72.2 ^a	70.4 ^b	60.2 ^d	61.1 ^c	55.2 ^e	56.6 ^e	0.5
Milk (Mg ha ⁻¹)	28.6 ^a	18.9 ^b	18.4 ^{bc}	15.6 ^d	17.4 ^c	11.6 ^e	1.0

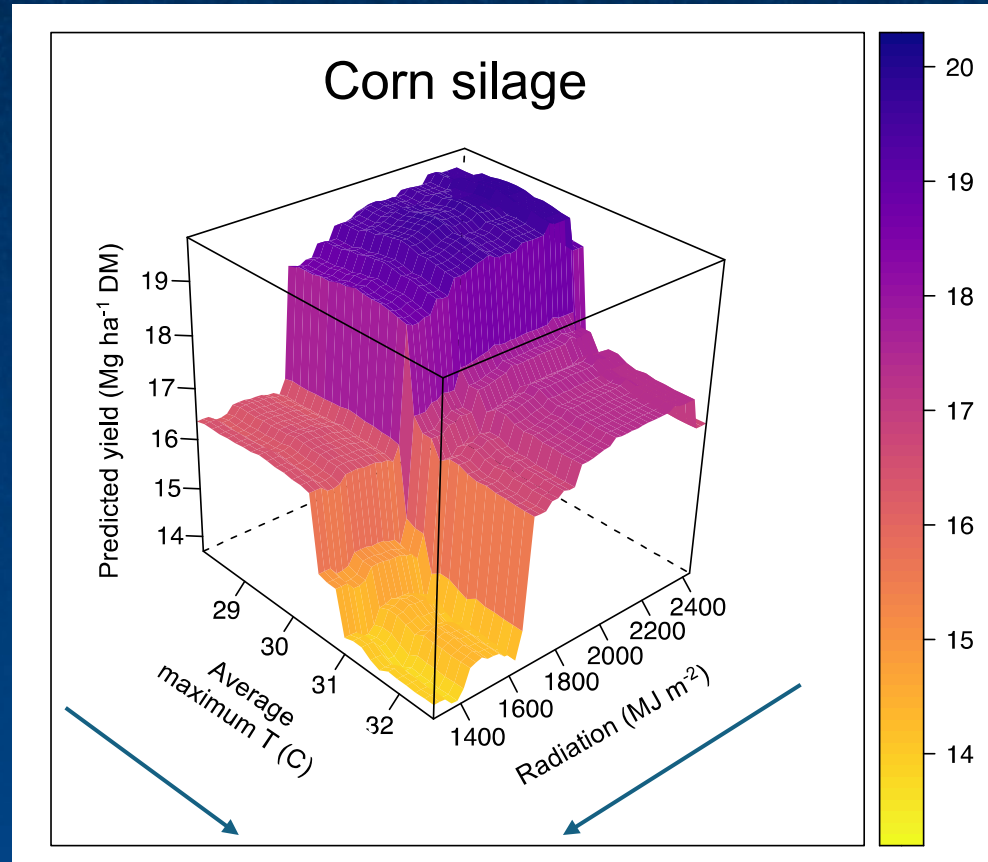




$R^2 = 77$



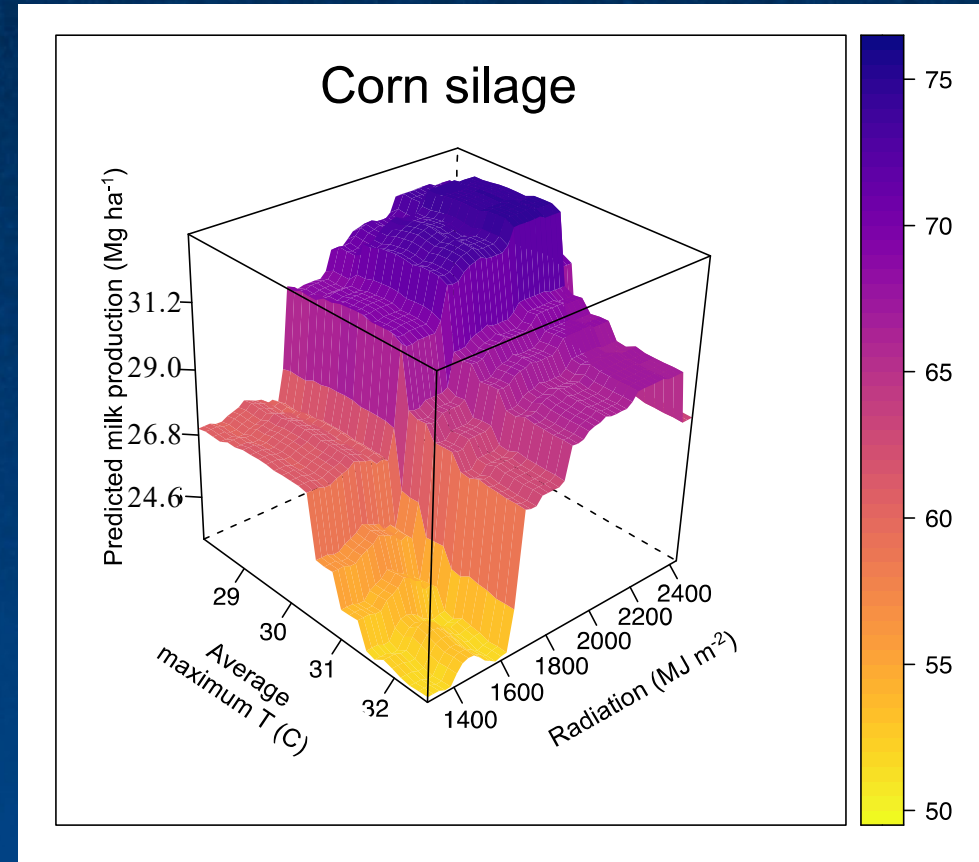
Forage harvested



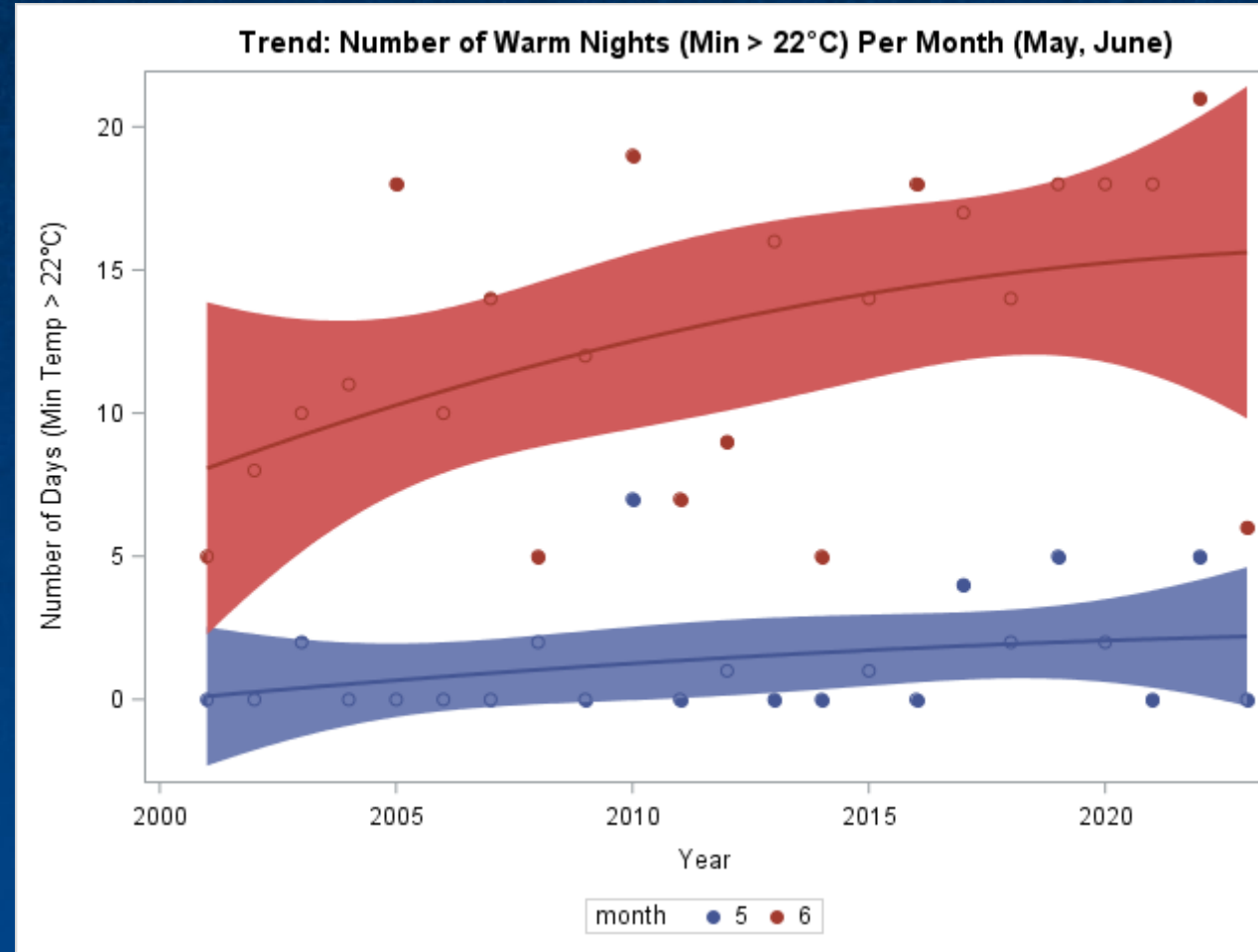
Hot days

Rainy summer

Estimated Milk/ha



Days with night temperature > 72 F



$P = 0.0320$
Year = 0.34289

Hybrid choice

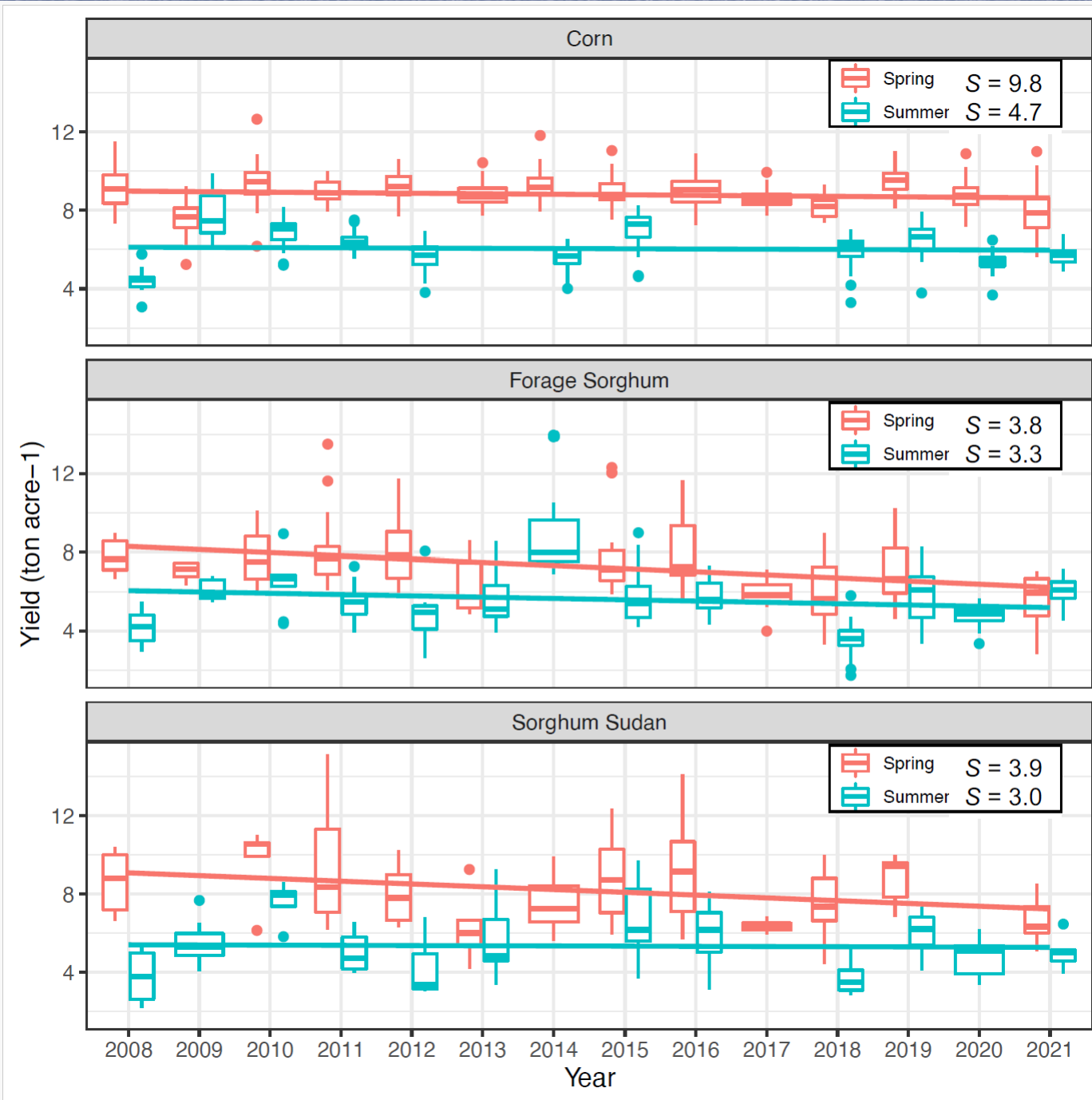
First management practices against pests and diseases



Florida's environment is prone to many pests and diseases! Affect production, quality and use.
Late-season plant health is very important for silage quality – fiber digestibility

• Sorghum vs. Corn?

- Corn is more stable than sorghum for both seasons.
- **Break even (ROI comparison)** when sorghum cost is 65% of the cost of corn in the spring or 82% for the summer.

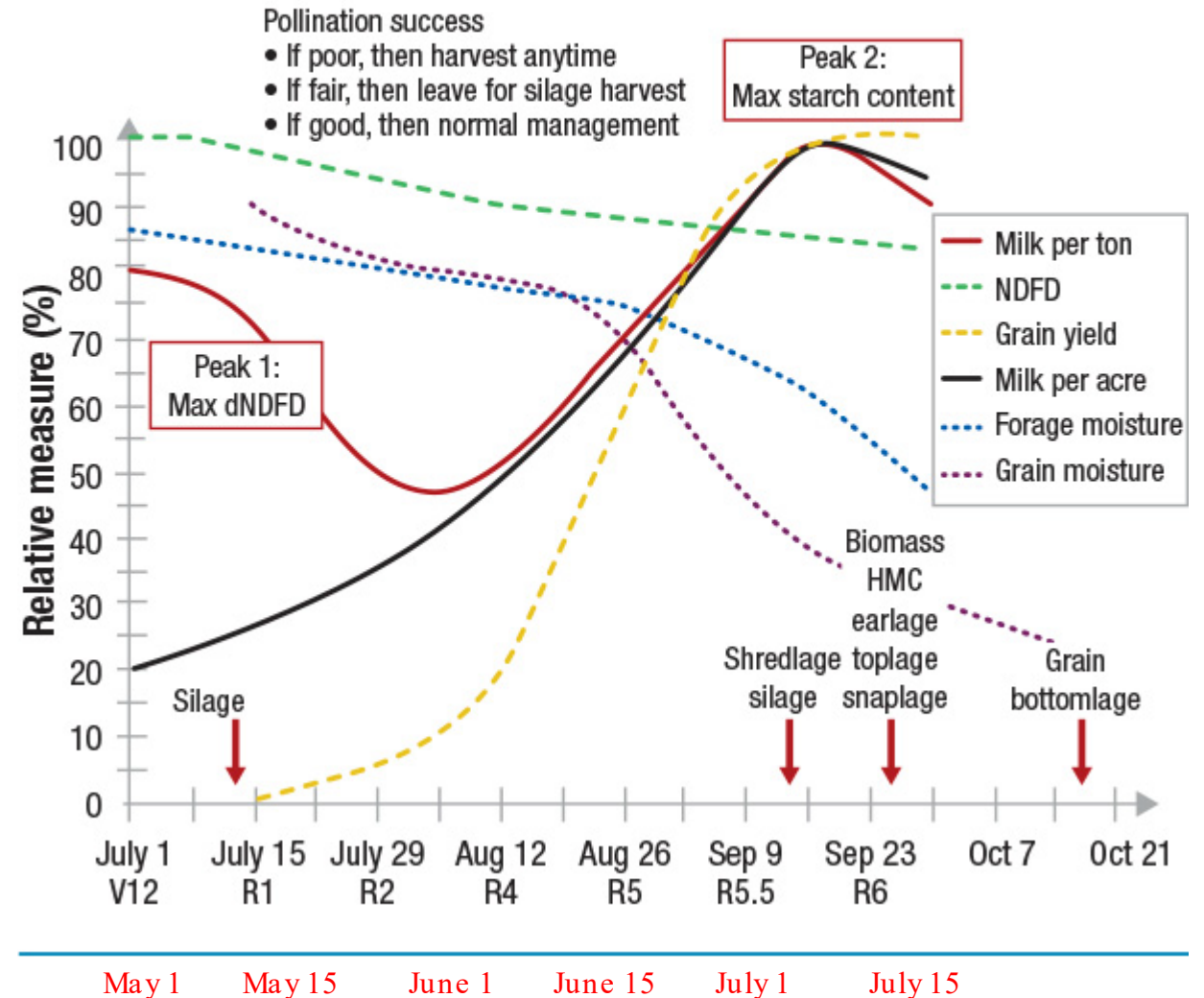


Heat

The “normal” corn development

FIGURE 1

Normal pattern of corn forage and grain development in Wisconsin



Joe Lauer – University of Wisconsin

<https://www.agproud.com/articles/46552-the-normal-pattern-of-corn-forage-and-grain-development>

Heat stress during
pollination/grain fill

Pollen kill

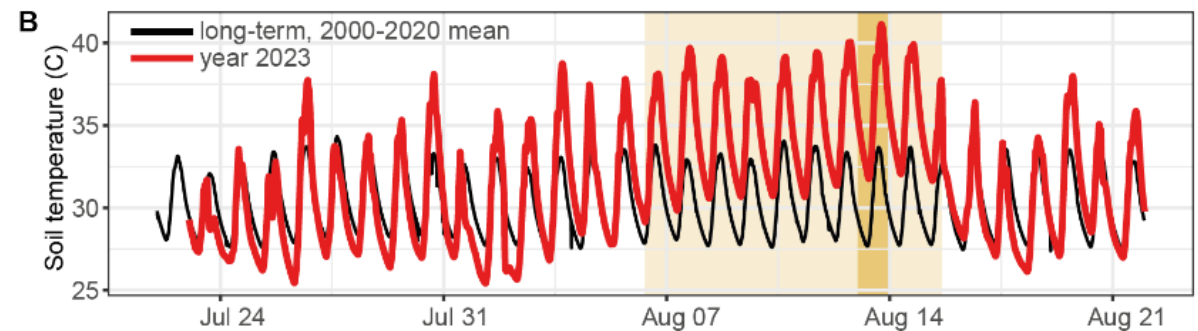
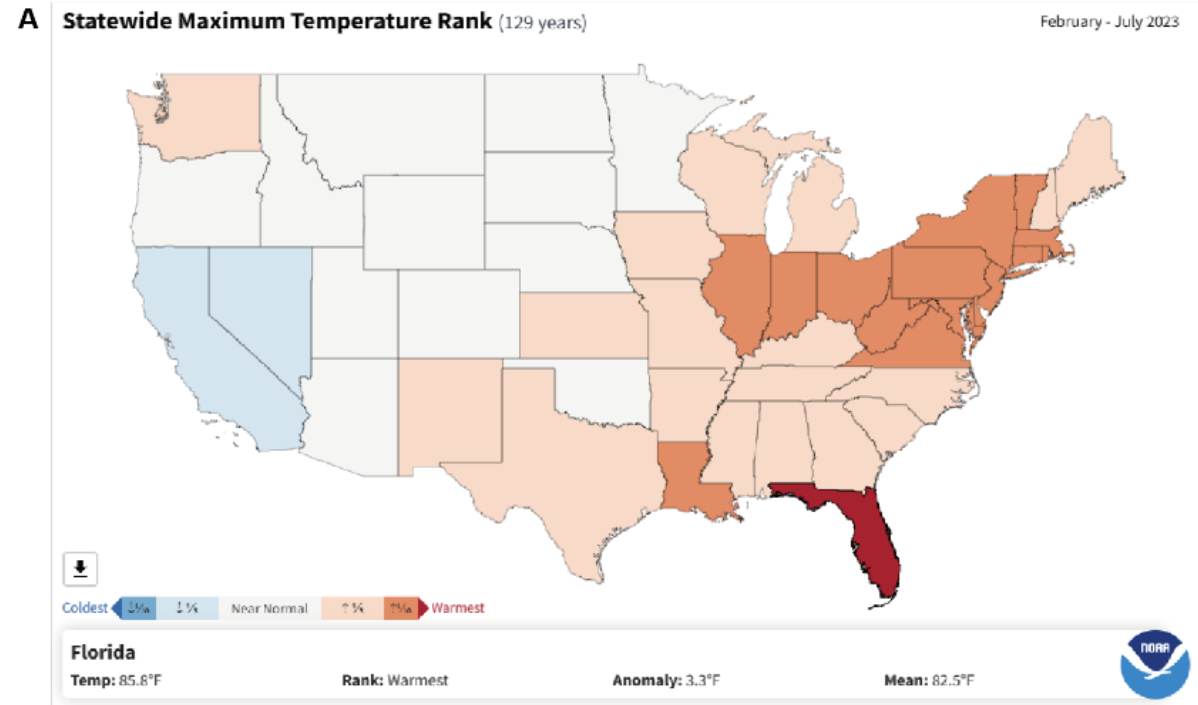
Kernel abortion

Limited kernel filling

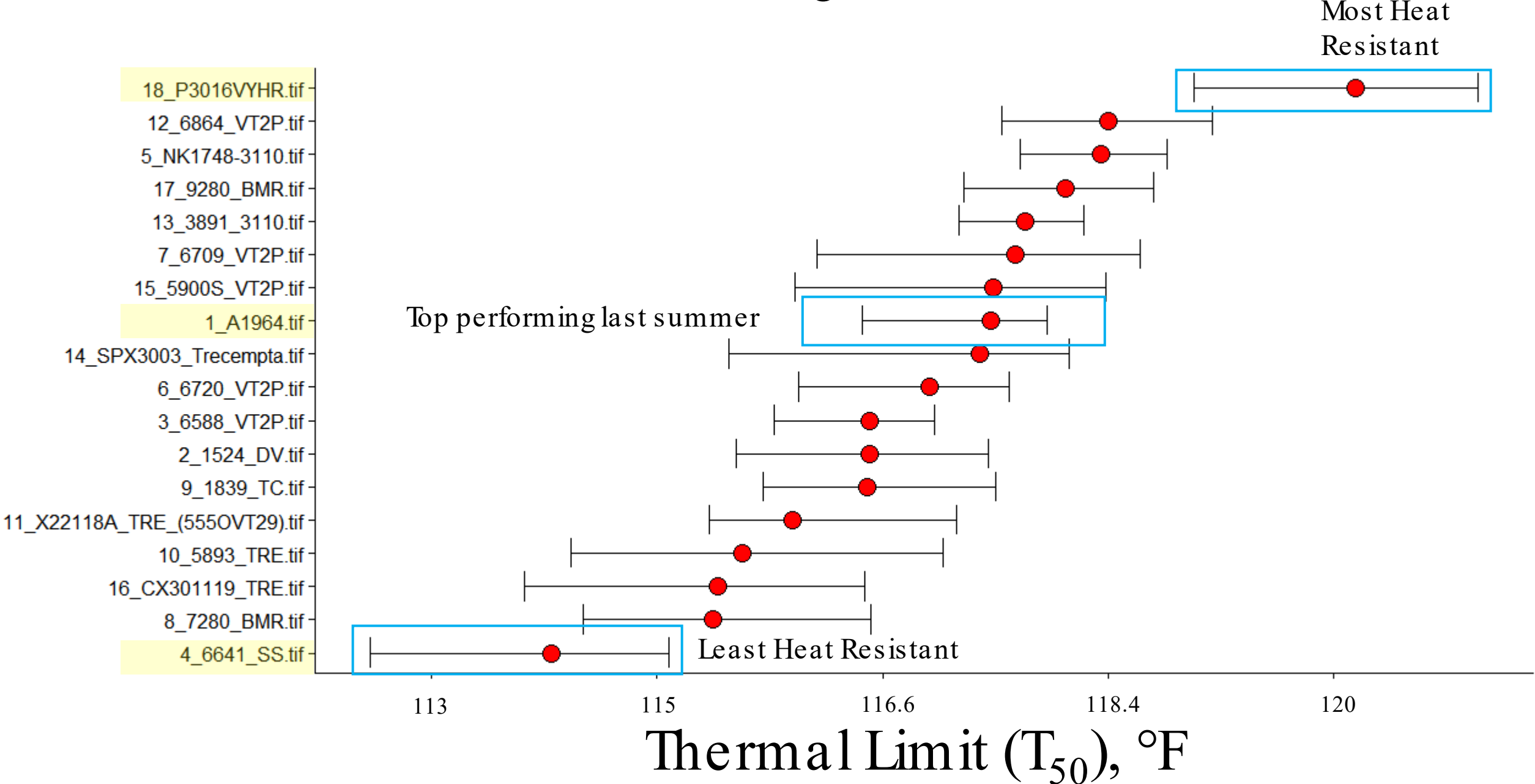


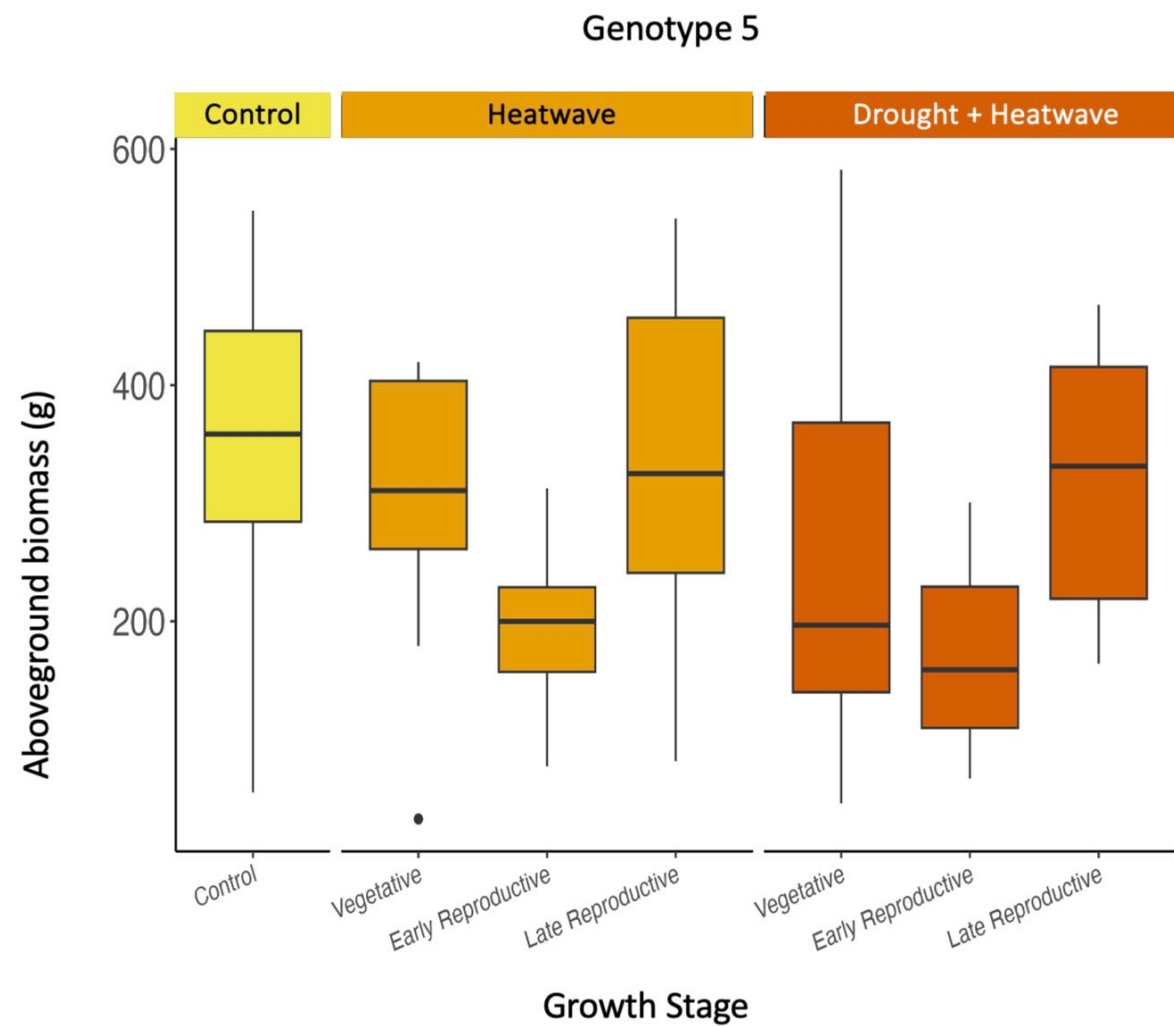
• Thermotolerance **How hot is too hot?**

2023 – hottest growing season in 129-year NOAA record



Initial Summer 2023 thermal limits in silage corn field trial varieties





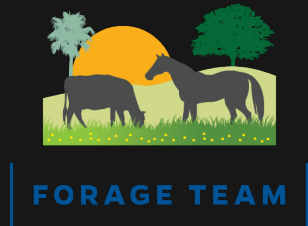
Dr. Bill Hammond



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Thank you!



UF IFAS Forages



UFForageTeam [uf.forages](https://uf.ifas.ufl.edu/forages)

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Questions?



- Top hybrids ~15-30% more milk/ha
- Corn more stable, but sorghum can be a better option depending on cost for summer planting
- Heat is becoming a challenge, and can affect corn productivity and silage quality

