

On-Farm Demonstration Trial: Crop Production Studies Corn Seeding Population Trials

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Objective

Determine the effects of corn seeding populations on yields to define best management practices.

Introduction

Corn planting is one of the most critical operations of the season. As corn seed prices continue to rise, it is important for farmers to find a population that maximizes both yield and profit. Planting too high of a corn population can result in increased barrenness and lower yields, but too low of a population also can result in lower yields. The objective of these trials was to investigate the effect on yield of various plant populations in corn.

After curing, all cultivars had statistically similar sugar content, except Tiana, with significantly lower degrees brix from the other cultivars, 8.5°Bx. All cultivars experienced increased sugar concentrations during the curing process.

After four weeks in storage, all cultivars had statistically similar sugar concentrations, except Tiana, with significantly lower degrees brix than the other cultivars, 9.6°Bx. All cultivars experienced increased sugar concentrations from samples taken directly after curing and at the time of harvest.

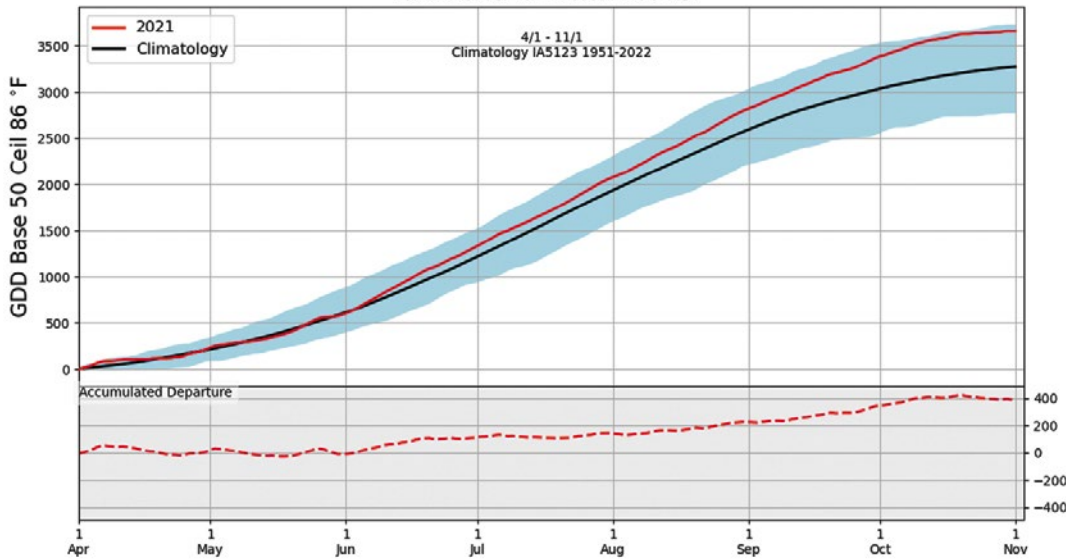
Materials and Methods

Crop Year–2021

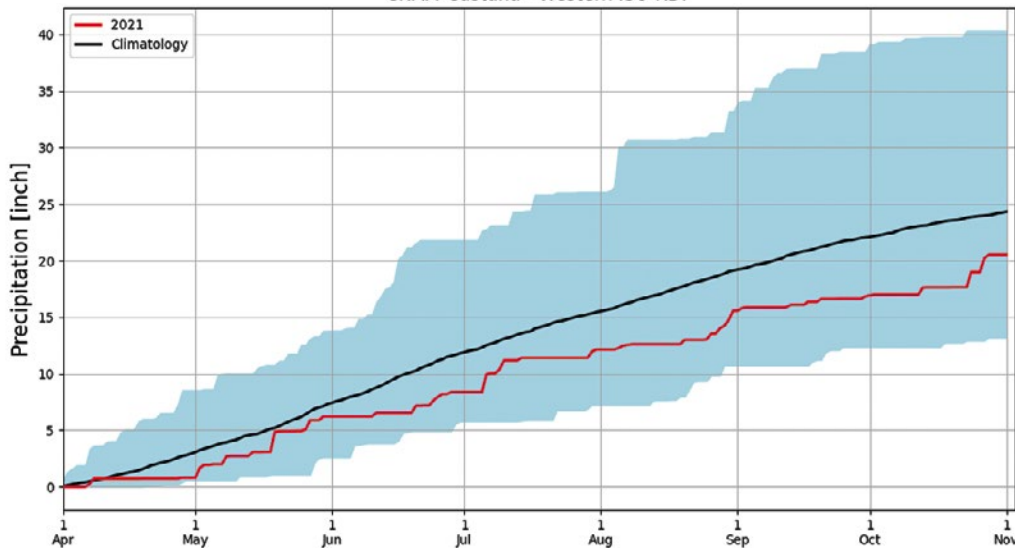
Trial	210305	210306	210307	210702
Trial County	Monona	Monona	Monona	Louisa
Soil Type	Ida Silt Loam	Ida Silt Loam	Napier Silt Loam	Mahaska
Previous Crop	Soybean	Soybean	Soybean	Soybean
Tillage	No-Till	No-Till	No-Till	Conventional
Current Crop	Corn	Corn	Corn	Corn
Hybrid–Number	59C66	5650	5650	9746-20
Hybrid–Company	LG Seeds	LG Seeds	LG Seeds	Stine
Row Spacing	30 in.	30 in.	30 in.	30 in.
Seeding Rate	28,000/ac 32,000/ac 36,000/ac	26,000/ac 32,000/ac	26,000/ac 32,000/ac	34,000/ac 36,000/ac 38,000/ac 40,000/ac
Planting Date	5/12/2021	5/7/2021	5/7/2021	4/27/2021
Harvest Date	11/8/2021	11/10/2021	11/10/2021	9/30/2021
Experimental Type	On-Farm Demo	On-Farm Demo	On-Farm Demo	On-Farm Demo
Replications	3	4	4	4

Location Climate Analysis

Accumulated GDD(base=50,ceil=86)
CNAI4 Castana - Western ISU-RDF



Accumulated Precipitation
CNAI4 Castana - Western ISU-RDF



Results

Trial Number	Treatment	Yield (bu/ac) ^a	P-value ^b	Return on Treatment ^c
210305	28,000	224.5 a	0.77	\$925.43/ac
	32,000	226.1 a		\$919.60/ac
	36,000	226.9 a		\$910.14/ac
210306	26,000	223.5 a	0.75	\$927.44/ac
	32,000	220.0 a		\$891.96/ac
210307	26,000	206.25 a	0.60	\$849.30/ac
	32,000	214.38 a		\$866.50/ac
210702	34,000	225.2 ab	0.04	\$908.98/ac
	36,000	233.4 a		\$939.58/ac
	38,000	219.3 b		\$869.17/ac
	40,000	230.2 ab		\$912.00/ac

^a Values denoted with the same letter within a trial are not statistically different at the significance level of 0.10.

^b P-value = the calculated probability that the difference in yields can be attributed to the treatments and no other factors. For example, if a trial has a P-value of 0.10, there is 90% confidence the yield differences are in response to treatments. This is consistent for demonstration trials.

^c Return on Treatment based on Seed prices at \$3.27 per 1,000 kernels. Cost from ISU Ag Decision maker cost of production 2021. \$4.53 corn commodity prices. ((Yield x Price)-Costs). Commodity price is the 2020 national average cash price for corn.

Key Takeaways

- Trial 210702 was the only trial that displayed significant yield differences.
- Return on treatment calculations are variable per experiment with different populations being more profitable.
- There is no plant population that will consistently be the best yielding for corn, as there are many other variables.