

Soybean Yield Under N and S Fertilization

Mark Licht—assistant professor, Department of Agronomy

Fernando Marcos—research scientist, Department of Agronomy

Objective

Determine the effects of harvest timing on corn yields to define best management practices.

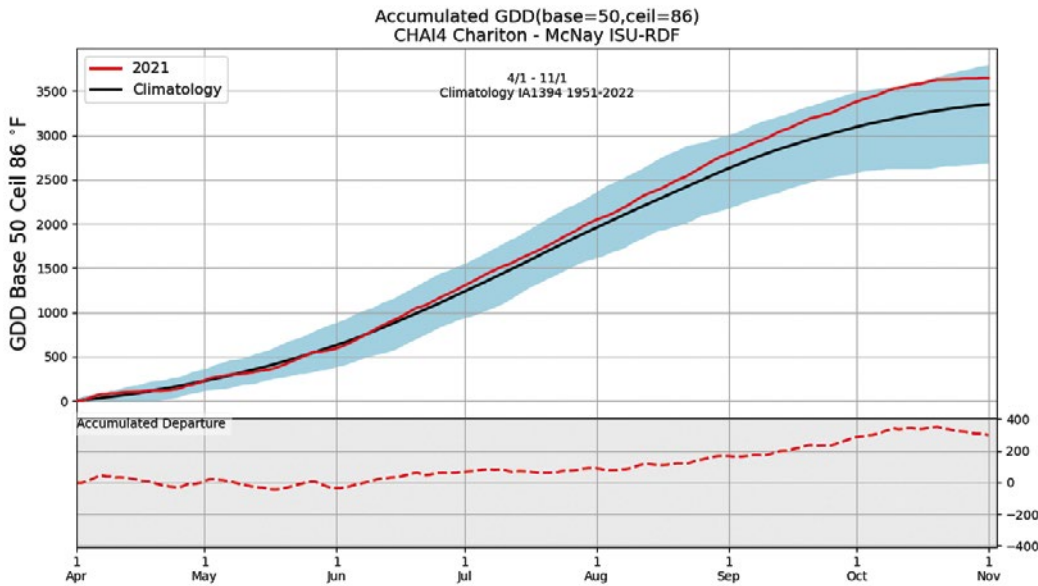
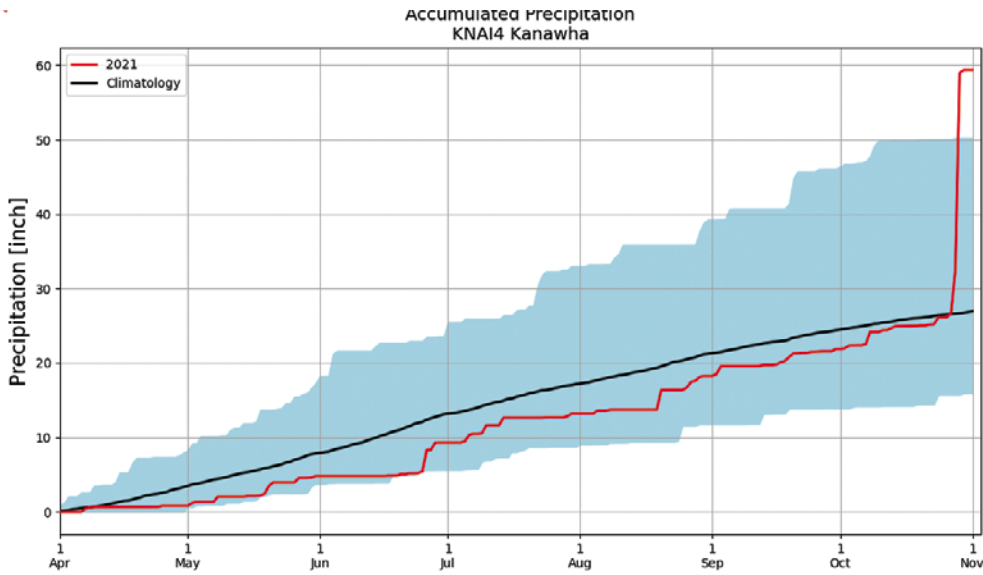
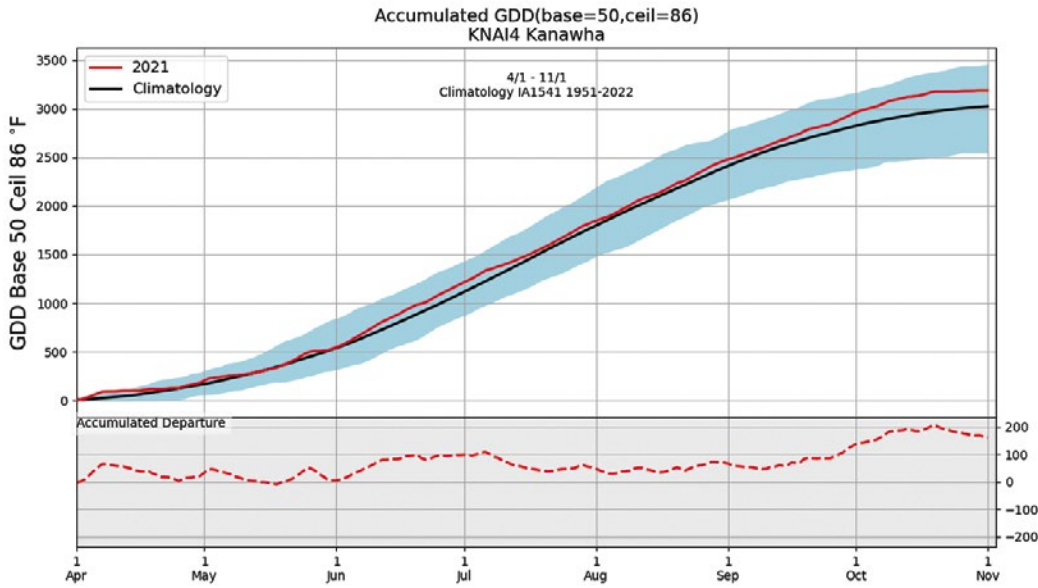
Introduction

Maximizing yield potential for farming systems is a challenge for corn and soybean farmers in Iowa. Many small changes in products, practices and timing can lead to very different results in yields. However, managing for maximum yield outputs rarely is the most economically sound investment for farmers. Striking that balance is key to success. Timing of corn harvest can have a dramatic effect on both the yields and profitability when grain drying costs are factored in. The objective of these trials was to investigate what effect various corn harvest timing would have on grain yield and the drying cost differences.

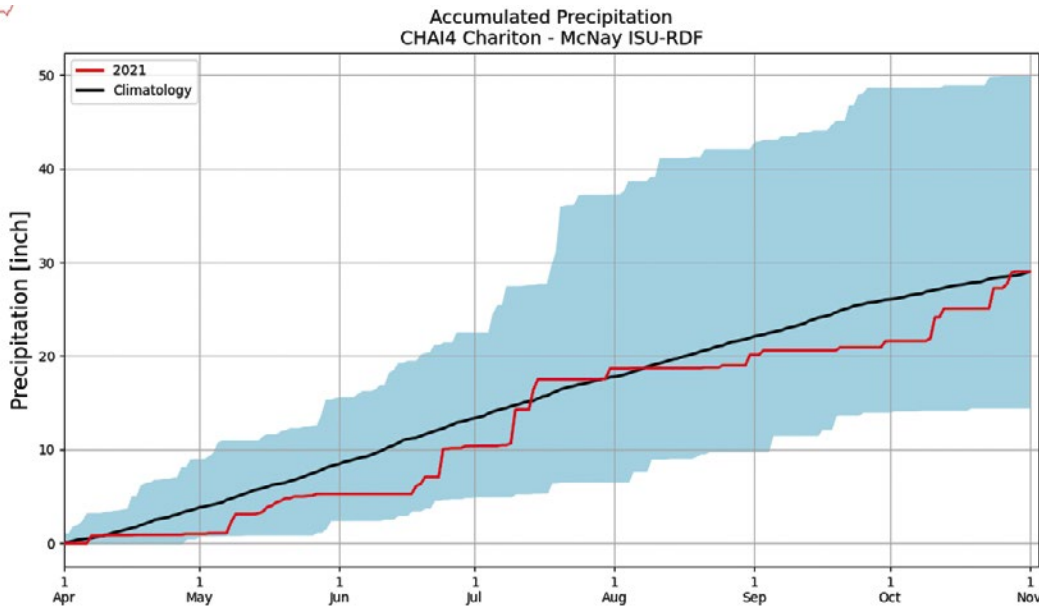
Crop Year—2021

Trial	210405	210411	210410	210006
Trial County	Hancock	Hancock	Hancock	Lucas
Soil Type	Canisteo, Webster	Canisteo, Webster	Canisteo, Webster	Haig, Grundy
Previous Crop	Soybean	Soybean	Soybean	Corn
Tillage	Conventional	Conventional	Conventional	Conventional
Current Crop	Corn	Corn	Corn	Corn
Hybrid—Variety Number	P0220AM	P1366Q	2605 RIB	P1082AM
Hybrid—Variety Company	Pioneer Corteva	Pioneer Corteva	Wyffels	Pioneer Corteva
Row Spacing	30 in.	30 in.	30 in.	30 in.
Seeding Rate	35,000/ac.	35,000/ac.	33,000/ac.	30,000/ac.
Planting Date	4/23/2021	4/23/2021	4/24/2021	4/25/2021
Harvest Date	9/16/2021 9/22/2021 10/1/2021 10/14/2021	10/1/2021 10/14/2021 10/23/2021 11/2/2021	9/16/2021 9/22/2021 10/1/2021 10/8/2021 10/14/2021	9/16/2021 9/23/2021 9/30/2021 10/6/2021
Experimental Type	On-Farm Demo	On-Farm Demo	On-Farm Demo	On-Farm Demo
Replications	4	4	4	3

Materials and Methods



Location Climate Analysis



Results

Trial Number	Treatment	Yield (bu./ac.) ^a	P-value ^b	Moisture	P-value ^b	Shrink Loss (bu./ac.) ^d	Drying Charge ^e	Return on Treatment ^c
210405	9/16/2021	149.2 a	<0.01	26.4 a	<0.01	23.6	\$73.18	\$495.79
	9/22/2021	145.4 a		22.0 b		13.7	\$45.53	\$551.07
	10/1/2021	145.2 a		16.5 c		2.1	\$6.53	\$641.71
	10/14/2021	125.3 b		15.2 c		0	0	\$567.60
210411	10/1/2021	146.2 a	<0.01	25.9 a	<0.01	22.0	\$68.42	\$494.20
	10/14/2021	123.3 bc		18.5 b		5.4	\$16.64	\$517.44
	10/23/2021	119.1 c		17.8 bc		4.0	\$12.32	\$509.08
	11/2/2021	128.8 b		17.5 c		3.7	\$11.59	\$555.11
210410	9/16/2021	166.3 a	<0.01	24.6 a	<0.01	22	\$68.10	\$585.58
	9/22/2021	168.1 a		20.3 b		11.7	\$36.31	\$672.18
	10/1/2021	151.6 b		14.9 c		0	0	\$686.75
	10/8/2021	134.2 c		15.1 c		0	0	\$607.93
	10/14/2021	136.7 c		12.9 d		0	0	\$619.25
210007	9/16/2021	217.2 a	<0.01	19.1 a	<0.01	11.3	\$35.19	\$897.54
	9/23/2021	203.5 b		16.6 b		3.2	\$10.74	\$896.62
	9/30/2021	201.0 b		14.5 c		0	0	\$910.53
	10/6/2021	202.0 b		14.9 c		0	0	\$915.06

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

^bP-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.

^cReturn on Treatment based on \$4.53 corn commodity prices. Commodity price is the 2020 national average cash price for corn. (((Yield-shrink)*\$4.53)-drying charge)

^dShrink Loss based on 1.45% shrink factor. Shrink factor obtained from 2020 industry survey. (((Moisture-15.5) x 1.45% or 0.0145) x grain yield)

^eDrying Charge based on \$.045 cost per wet bushel per point of moisture removed. Drying charge cost obtained from 2020 industry survey. (((Moisture - 15.5) x \$.045) x grain yield).

Key Takeaways

- Corn yield and moisture levels significantly decreased as harvest timing was delayed.
- Combine settings were adjusted each harvest timing for maximum efficiency.
- Cause of yield loss is unknown, but research has shown that actual kernel dry matter loss is most likely not happening.
- NOTE: The results presented are from replicated demonstration trials. Statistics are used to detect differences at a location and should not be interpreted beyond the single location.