Field Station Weather Reports

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Field Station Weather Reports

Abstract

The research program at the Kansas State University East Central Kansas Experiment Field is designed to keep area crop producers abreast of technological advances in agronomic agriculture. Specific objectives are to (1) identify top performing varieties and hybrids of wheat, corn, soybean, and grain sorghum; (2) establish the amount of tillage and crop residue cover needed for optimum crop production; (3) evaluate weed and disease control practices using chemical, no chemical, and combination methods; and (4) test fertilizer rates, timing, and application methods for agronomic proficiency and environmental stewardship.

The Kansas River Valley Experiment Field was established to study management and effective use of irrigation resources for crop production in the Kansas River Valley (KRV). The Paramore Unit consists of 80 acres located 3.5 miles east of Silver Lake on U.S. Highway 24, then 1 mile south of Kiro, and 1.5 miles east on 17th Street. The Rossville Unit consists of 80 acres located 1 mile east of Rossville or 4 miles west of Silver Lake on U.S. Highway 24.

Keywords

East Central Kansas, Kansas State experiment field, Kaw River Valley, Kansas State Experiment Field, 2018 growing season weather, Kansas weather

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East Central Kansas Experiment Field

Introduction

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Soil Description

Soils on the field's 160 acres are Woodson. The terrain is upland and level to gently rolling. The surface soil is a dark gray-brown, somewhat poorly drained silt loam to silty clay loam over slowly permeable clay subsoil. The soil is derived from old alluvium. Water intake is slow, averaging less than 0.1 in./hour when saturated. This makes the soil susceptible to water runoff and sheet erosion.

2018 Weather Information

Precipitation during 2018 was almost average, however, eight months were below average and October was more than 3 times the average (Table 1). Overall, the 2018 growing season was warmer than average. The summer of 2018 had 29 days exceeding 90°F and 1 day exceeding 100°F, which compares to 37 and 29 days exceeding 90°F, respectively in 2016 and 2017, with one day exceeding 100°F in 2017. There were 13 days with low temperatures in the single digits, compared to 4 and 8 days in 2016 and 2017, respectively. The last freezing temperature in the spring was April 16 (average, April 18), and the first killing frost in the fall was October 21 (average, October 21). There were 188 frost-free days, similar to the long-term average of 185.

The growing conditions were very stressful in June and July, reducing the yield potential, especially with corn and wheat. The short and full season corn hybrid trials both averaged 111 bu/a. The soybean yields were hurt by the heat, especially in the early maturing trial. The early maturing soybean variety trial averaged 45 bu/a and the later maturing trial 56, compared to 72 in 2017, 79 in 2016, 59 in 2015, and 41 in 2014.

Kansas River Valley Experiment Field

Introduction

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Soil Description

Soils on the two fields are predominately in the Eudora series. Small areas of soils in the Sarpy, Kimo, and Wabash series also occur. Except for small areas of Kimo and Wabash soils in low areas, the soils are well drained. Soil texture varies from silt loam to sandy loam, and the soils are subject to wind erosion. Most soils are deep, but texture and surface drainage vary widely.

2018 Weather Information

The year was colder in the winter and warmer in the summer than last year, with below average rainfall during most of the growing season. The frost-free season was 184 days at the both units (average = 173 days), with 18 and 17 days in the single digits or lower at Rossville and Paramore, respectively, compared to 9 days in single digits at both units in 2017. The last spring freeze was April 20 (average = April 21), and the first fall freeze was October 21 (average = October 11). There were 61 and 58 days above 90°F at Paramore and Rossville, respectively, and none above 100°F. Precipitation was just below normal at both fields for the year (Table 2), with a major exception being October rainfall, which was 6 to 7 times greater than average. Irrigation requirements were just over 11 inches for the corn and 4.8 inches for the soybeans. The corn performance trials averaged 237 bu/a for the irrigated and 114 for the dryland. The soybean performance trials averaged 58 bu/a for the irrigated and 56 bu/a for the dryland. The soil moisture in the dryland was a major yield-limiting factor, especially during July. The sudden death syndrome foliar symptoms were not visible until mid-August in most fields in 2018, reducing the yield loss due to the disease.

Table 1. Precipitation at the East Central Kansas Experiment Field, Ottawa

Month	2018	35-year avg.	Month	2018	35-year avg.
	---------------- in. ----------------			---------------- in. ----------------	
January	0.72	1.03	July	1.60	3.37
February	0.97	1.32	August	4.86	3.59
March	3.33	2.49	September	3.28	3.83
April	1.40	3.50	October	11.73	3.43
May	3.20	5.23	November	1.13	2.32
June	1.55	5.21	December	2.33	1.45
			Annual total	36.10	36.78

Table 2. Precipitation at the Kansas River Valley Experiment Field

Month	Rossville Unit		Paramore Unit	
	2018	30-year avg.	2018	30-year avg.
	------------in.------------			
January	0.49	3.18	0.56	3.08
February	0.38	4.88	0.42	4.45
March	0.75	5.46	0.63	5.54
April	1.39	3.67	0.99	3.59
May	4.55	3.44	3.57	3.89
June	5.94	4.64	3.56	3.81
July	2.18	2.97	1.38	3.06
August	3.99	1.90	3.67	1.93
September	2.62	1.24	1.87	1.43
October	6.63	0.95	7.03	0.95
November	0.81	0.89	0.81	1.04
December	3.48	2.42	3.29	2.46
Total	33.21	35.64	27.78	35.23

Table 3. Precipitation at Ashland Bottoms, Belleville, and Colby

Month	Ashland Bottoms 2018	Ashland Bottoms 30-year average	Belleville 2018	Belleville 30-year average	Colby 2018	Colby 30-year average
	--- in. ---					
January	0.4	0.65	0.26	0.61	1.41	0.41
February	0.4	1.07	0.66	0.87	0.37	0.48
March	0.69	2.20	1.08	2.12	0.6	1.12
April	1.71	2.80	1.23	2.87	1.01	2.03
May	3.28	4.48	2.55	4.35	4.44	3.29
June	2.15	5.09	4.29	4.37	3.29	2.54
July	2.86	3.97	6.85	3.97	2.54	3.77
August	6.65	4.28	4.2	3.68	2.81	2.78
September	5.02	3.17	5.09	3.25	0.59	1.45
October	5.88	2.22	5.72	2.37	3.37	1.58
November	0.75	1.60	1.37	1.19	0.42	0.72
December	2.48	1.02	3.41	0.95	0.97	0.48
Annual	32.27	32.55	36.71	30.6	21.82	20.65
Last freeze	4/19/18		4/20/18		4/27/18	
First freeze	10/14/18		10/11/18		10/11/18	
Frost free days	178		174		167	
Days above 90°F	64		53		51	
Days above 100°F	10		6		6	
Days below 10°F	15		30		24	

Table 4. Precipitation at Great Bend, Hays, Hutchinson

Month	Great Bend		Hays		Hutchinson	
	2018	30-year average	2018	30-year average	2018	30-year average
				in.		
January	0.15	0.61	0.65	0.50	0.30	0.50
February	0.24	0.83	0.40	0.71	0.26	0.71
March	1.41	1.94	0.70	1.81	2.14	1.81
April	1.36	2.36	1.24	2.14	1.18	2.14
May	6.23	4.38	3.73	3.26	3.83	3.26
June	5.17	3.97	4.24	2.83	5.05	2.83
July	2.69	3.41	8.85	3.92	6.84	3.92
August	5.15	3.33	5.48	3.04	3.14	3.04
September	5.43	1.96	3.64	2.05	4.43	2.05
October	6.45	2.05	6.75	1.58	9.18	1.58
November	0.62	0.97	0.78	0.89	0.81	0.89
December	2.25	0.85	1.35	0.72	2.62	0.72
Annual	37.15	26.66	37.81	23.45	39.78	23.45
Last freeze	4/26/18		4/26/18		4/19/18	
First freeze	10/15/18		10/11/18		10/15/18	
Frost free days	172		167		167	
Days above 90°F	60		61		67	
Days above 100°F	2		4		3	
Days below 10°F	20		20		14	

Table 5. Precipitation at Leoti, Manhattan, and Ottawa

Month	Leoti 2018	Leoti 30-year average	Manhattan North Farm 2018	Manhattan North Farm 30-year average	Ottawa 2018	Ottawa 30-year average
			------------- in. -------------			
January	0.02	0.42	0.56	0.63	1.23	0.63
February	0.09	0.53	0.57	1.08	1.47	1.08
March	0.10	1.38	0.60	2.49	2.67	2.49
April	0.23	2.00	1.52	3.17	3.84	3.17
May	0.55	2.57	3.78	5.09	5.41	5.09
June	0.63	2.58	2.57	5.70	5.63	5.70
July	0.68	2.90	2.43	4.42	4.09	4.42
August	1.31	2.79	8.41	4.12	4.04	4.12
September	1.69	1.57	8.01	3.43	4.12	3.43
October	2.95	1.47	5.72	2.69	3.32	2.69
November	3.83	0.65	0.86	1.73	2.70	1.73
December	4.23	0.57	2.71	1.07	1.78	1.07
Annual	16.31	19.43	37.74	35.62	40.3	35.62
Last freeze	4/25/18		4/20/18		4/17/18	
First freeze	10/11/18		10/14/18		10/11/18	
Frost free days	168		177		181	
Days above 90°F	60		72		52	
Days above 100°F	9		6		1	
Days below 10°F	18		13		14	

Table 6. Precipitation at Silver Lake (Paramore), Rossville, Scandia

Month	Silver Lake		Rossville		Scandia	
	2018	30-year average	2018	30-year average	2018	30-year average
	--- in. ---					
January	0.56	3.18	0.49	3.08	0.16	0.45
February	0.42	4.88	0.38	4.45	0.27	0.74
March	0.63	5.46	0.75	5.54	0.99	2.12
April	0.99	3.67	1.39	3.59	0.77	2.96
May	3.57	3.44	4.55	3.89	2.12	4.21
June	3.56	4.64	5.94	3.81	6.83	3.81
July	1.38	2.97	2.18	3.06	2.59	4.24
August	3.67	1.90	3.99	1.93	4.49	3.26
September	1.87	1.24	2.62	1.43	4.08	2.84
October	7.03	0.95	6.63	0.95	4.53	2.14
November	0.81	0.89	0.81	1.04	0.88	1.26
December	3.29	2.42	3.48	2.46	2.49	0.79
Annual	27.78	35.64	33.21	35.23	30.20	28.82
Last freeze	4/20/18		4/20/18		4/27/18	
First freeze	10/14/18		10/11/18		10/11/18	
Frost free days	177		177		167	
Days above 90°F	62		60		43	
Days above 100°F	0		0		0	
Days below 10°F	17		18		36	