

2019 Fall Cauliflower Trial in Georgetown, Delaware

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A fall cauliflower trial was conducted in 2019 at the University of Delaware's Thurman Adams Jr. Agricultural Research Farm near Georgetown, Delaware.

Materials and Methods

The trial included seventeen varieties (Table 1). Fourteen were entered by participating seed companies and three were controls. Varieties were seeded on July 19, 2019 into 72-cell plug trays. A preplant herbicide application of Goaltender 1 pt/A and Dual Magnum 1pt/A was made on August 9. Plants were transplanted to the field on August 12. Plots were 24 ft long with plants spaced at 2 ft in the row and rows 2.5 ft apart. Twelve plants were planted per plot and the center ten plants were considered the record plants (end plants were not harvested). Plots were arranged in a randomized complete block design with four replications. The trial was overhead irrigated with a traveling linear system.

Applications for insect and disease control were as follows:

August 21: Kocide 1 lb/A, Inspire Super 1 pt/A, Dipel 1 lb/A

August 28: Kocide 1 lb/A, Quintec 14 oz/A, Dipel 1 lb/A

September 11: Kocide 1 lb/A, Quadris Top 14 oz/A, Dipel 1 lb/A

September 23: Mastercop 1 pt/A, Quadris Top 14 oz/A, Dipel 1 lb/A

October 10: Mastercop 1 pt/A, Quadris Top 14 oz/A, Dipel 1 lb/A, Besiege 10 oz/A, Borosol 2 qt/A

October 18: Mastercop 1 pt/A, Quadris Top 14 oz/A, Besiege 10 oz/A, Borosol 2 qt/A

October 24: Mastercop 1 pt/A, Quadris Top 14 oz/A, Besiege 10 oz/A, Borosol 2 qt/A

November 1: Mastercop 1 pt/A, Quadris Top 14 oz/A, Besiege 10 oz/A, Borosol 2 qt/A

November 8: Quadris Top 14 oz/A, Besiege 10 oz/A

The plot was harvested on October 30, November 8 and November 22. Individual heads were weighed and head diameter, head height and stem diameter measured. Heads were graded based on size (less than 4 inches diameter unmarketable) and quality defects (excessively discolored, ricey, fuzzy and knuckled heads were considered unmarketable).

Table 1. Varieties Included in the 2019 Fall Cauliflower Trial and Entering Company

Variety Name	Entering Company	Variety Name	Entering Company
Candid Charm	Sakata	Sisquoc	Rijk Zwaan
Twister	Sakata	Casper	Rijk Zwaan
Bermeo	Bejo	Denali	Rijk Zwaan
Flamenco	Bejo	Bishop	Rijk Zwaan
Alcala	Bejo	Klamath	Rijk Zwaan
Zaragoza	Bejo	Whistler	control
Adona	Bejo	Amazing	control
Toledo	Bejo	Freedom	control
Danville	Rijk Zwaan		

Results and Discussion

This trial experienced high temperatures until 57 DAT on October 8. Temperatures were above 80°F on 68% of days in this time period. Rainfall was low in September. Weather data for the trial is in Appendix B. Weed and insect control in the trial were excellent and disease control was good.

Possibly because of temperatures stress in August and September, this trial was slow to mature and some varieties did not produce heads before freezing. Earlier maturing varieties tended to have better yields, however later maturing varieties that were exposed to less heat stress had fewer quality defects (Table 2).

The earliest maturing variety, Candid Charm, produced significantly higher marketable yield than all of the other varieties in the trial (Table 3). Additional varieties that produced more than 10,000 lbs/acre of marketable yield were Bermeo, Flamenco, Freedom, Alcala and Bishop.

Table 2. 2019 Delaware Cauliflower Trial: Head weight, diameter and height; stem diameter; quality defects observed.

Variety	Head Weight (lbs)	Diameter (inches)	Height (inches)	Stem Diameter (inches)	Defects Observed
Candid Charm	3.15	6.72	5.13	1.58	slight fuzziness in many
Bermeo	1.98	5.70	4.66	1.43	few fuzzy or ricey
Twister	1.89	5.57	4.36	1.29	no defects
Flamenco	1.89	5.69	4.64	1.38	few fuzzy or ricey
Freedom	1.84	5.52	4.22	1.46	few knuckling, many slight fuzz
Whistler	1.76	5.47	4.19	1.30	no defects
Bishop	1.69	5.30	4.19	1.34	few discoloration, knuckling, ricey
Denali	1.68	5.38	4.14	1.21	discoloration
Alcala	1.65	5.29	3.91	1.29	few ricey
Toledo	1.58	5.17	3.52	1.16	no defects
Casper	1.55	5.19	3.76	1.18	no defects
Danville	1.53	5.15	3.77	1.23	no defects
Zaragoza	1.46	5.06	3.95	1.29	no defects
Adona	1.45	5.09	3.65	1.10	no defects
Amazing	1.17	4.85	3.51	1.13	few ricey
Klamath	1.11	4.73	3.11	1.24	no defects
Sisquoc	no heads formed

Photographs of the varieties are in Appendix A.

Table 3. 2019 Delaware Cauliflower Trial Yield: Percent plant survival, days from transplant to harvest, total yield, marketable yield, percent of plants producing a head, percent of plants producing a marketable head and marketable weight as a percent of total weight.

	% Plant Survival	Days to Harvest	Total Yield (heads/a)	Total Yield (lbs/a)	Mkt Yield (heads/a)	Mkt Yield (lbs/a)	% Plants w/ Head	% Plants w/ Mkt Head	% Mkt Weight
Candid Charm	95 ab	80 c	8,277 a	25,265 a	7,841 a	24,733 a	100 a	95 a	98 a
Bermeo	93 ab	95 ab	8,059 ab	14,941 b	6,970 ab	13,734 b	100 a	86 ab	91 a
Flamenco	100 a	88 bc	7,188 ab	13,619 bc	6,752 ab	12,807 bc	83 abc	78 abc	94 a
Freedom	90 ab	82 c	6,752 ab	12,184 bcd	6,316 bc	11,595 bc	87 ab	82 ab	94 a
Alcala	95 ab	94 ab	6,534 bc	10,784 cde	6,317 bc	10,421 bcd	78 bc	76 bcd	97 a
Bishop	90 ab	93 ab	6,534 bc	11,183 cde	6,099 bc	10,229 bcd	83 abc	78 abc	90 a
Twister	98 ab	93 ab	6,752 ab	10,457 cde	5,010 cd	9,428 cd	80 abc	59 de	89 a
Zaragoza	98 ab	93 ab	7,188 ab	9,670 de	6,316 bc	9,139 cd	84 ab	74 bcd	95 a
Denali	88 ab	96 ab	5,009 cd	7,922 e	4,574 d	7,613 de	67 bcd	61 cde	97 a
Whistler	90 ab	93 ab	4,937 cd	7,916 e	4,356 d	7,529 de	63 cd	56 e	96 a
Danville	95 ab	101 a	2,614 e	3,991 f	2,614 e	3,991 ef	31 ef	31 f	100 a
Amazing	90 ab	97 ab	3,921 de	3,819 f	2,396 e	2,839 fg	52 de	29 fg	72 ab
Klamath	88 ab	102 a	871 f	981 fg	871 f	981 fg	12 fg	12 gh	75 ab
Adona	60 c	102 a	436 f	623 fg	436 f	623 fg	8 g	8 h	50 bc
Casper	85 b	102 a	436 f	518 fg	218 f	329 fg	5 g	3 h	25 cd
Toledo	88 ab	102 a	436 f	476 fg	218 f	325 fg	6 g	3 h	25 cd
Sisquoc	98 ab	.	0 f	0 g	0 f	0 g	0 g	0 h	0 d
<i>p-value</i>	<i>0.0016</i>	<i>0.0003</i>	<i><0.0001</i>	<i><0.0001</i>	<i><0.0001</i>	<i><0.0001</i>	<i><0.0001</i>	<i><0.0001</i>	<i><0.0001</i>
LSD	14.8	10.1	1735.5	3614.4	1523.3	3856.1	20.8	17.7	39.3
CV	11.4	6.8	27.1	31.8	26.8	36.1	26.3	25.4	36.3

Appendix A: Photos of Harvested Varieties



Candid Charm
Sakata



Bermeo
Bejo



Flamenco
Bejo



Freedom
check (Seminis)



Alcala
Bejo



Bishop
Rijk Zwaan



Twister
Sakata



Zaragoza
Bejo



Denali
Rijk Zwaan



Whistler
check (Seminis)



Amazing
check

No photos available for:

Danville
Klamath
Adona
Casper
Toledo
Sisquoc

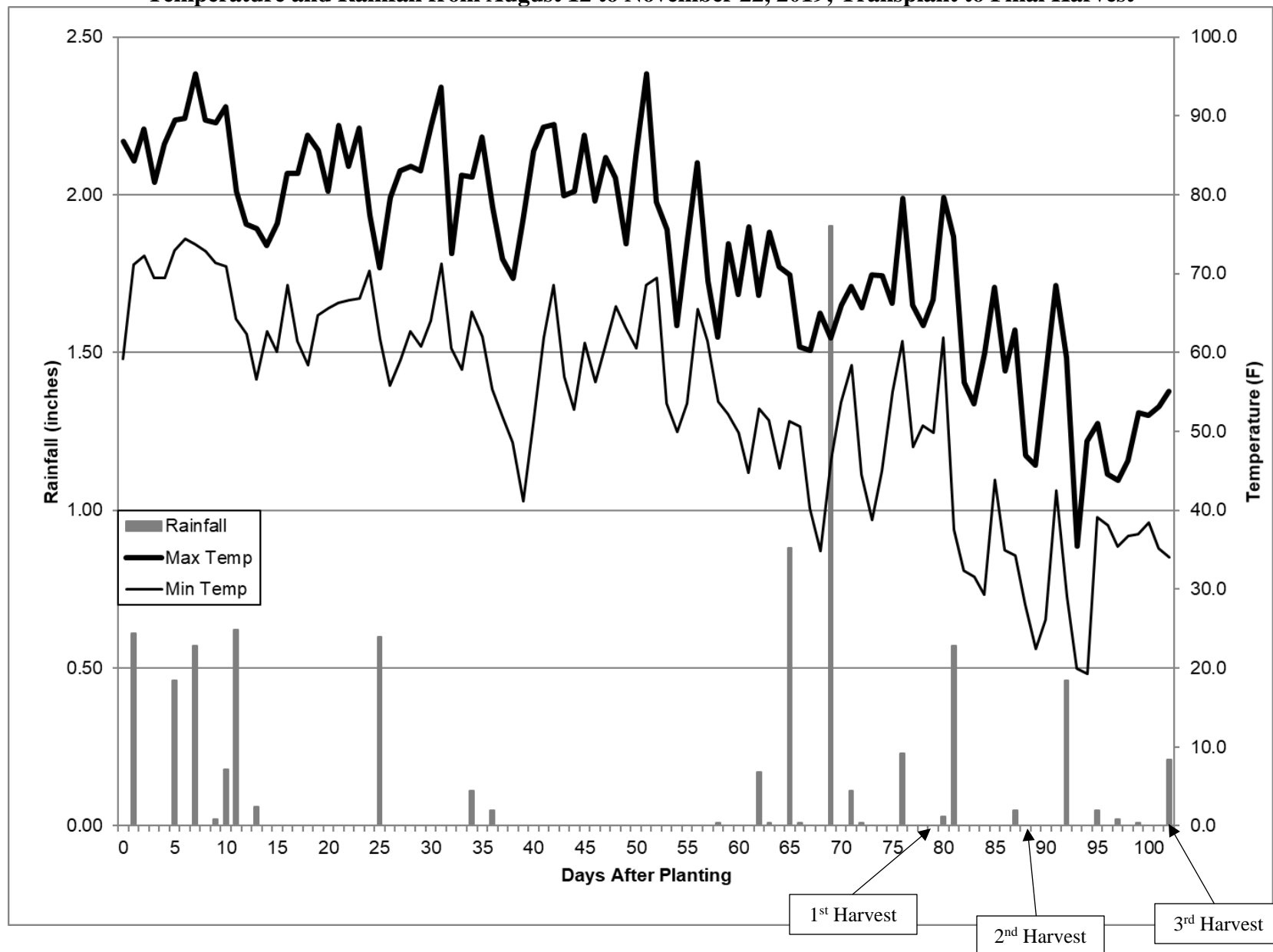
Appendix B:
Weather Conditions from August 12 to November 22, 2019
Transplant to Final Harvest

Date	DAT	Temp °F		Rainfall (in)
		Max	Min	
12-Aug	0	86.8	59.2	0.00
13-Aug	1	84.3	71.1	0.61
14-Aug	2	88.3	72.3	0.00
15-Aug	3	81.6	69.5	0.00
16-Aug	4	86.4	69.4	0.00
17-Aug	5	89.5	72.9	0.46
18-Aug	6	89.7	74.4	0.00
19-Aug	7	95.3	73.7	0.57
20-Aug	8	89.5	72.8	0.00
21-Aug	9	89.1	71.4	0.02
22-Aug	10	91.2	70.9	0.18
23-Aug	11	80.4	64.3	0.62
24-Aug	12	76.3	62.3	0.00
25-Aug	13	75.7	56.6	0.06
26-Aug	14	73.6	62.7	0.00
27-Aug	15	76.4	60.1	0.00
28-Aug	16	82.7	68.6	0.00
29-Aug	17	82.7	61.5	0.00
30-Aug	18	87.5	58.4	0.00
31-Aug	19	85.6	64.7	0.00
1-Sep	20	80.4	65.6	0.00
2-Sep	21	88.8	66.3	0.00
3-Sep	22	83.6	66.6	0.00
4-Sep	23	88.5	66.9	0.00
5-Sep	24	77.4	70.4	0.00
6-Sep	25	70.8	61.7	0.60
7-Sep	26	79.6	55.8	0.00
8-Sep	27	83.0	59.1	0.00
9-Sep	28	83.6	62.7	0.00
10-Sep	29	83.0	60.8	0.00
11-Sep	30	88.8	64.0	0.00
12-Sep	31	93.6	71.3	0.00
13-Sep	32	72.5	60.5	0.00
14-Sep	33	82.5	57.8	0.00
15-Sep	34	82.3	65.2	0.11

Date	DAT	Temp °F		Rainfall (in)
		Max	Min	
16-Sep	35	87.3	62.0	0.00
17-Sep	36	78.4	55.3	0.05
18-Sep	37	71.9	51.7	0.00
19-Sep	38	69.4	48.6	0.00
20-Sep	39	76.7	41.2	0.00
21-Sep	40	85.5	50.8	0.00
22-Sep	41	88.6	61.9	0.00
23-Sep	42	88.9	68.5	0.00
24-Sep	43	79.9	56.9	0.00
25-Sep	44	80.5	52.8	0.00
26-Sep	45	87.6	61.2	0.00
27-Sep	46	79.2	56.3	0.00
28-Sep	47	84.7	60.8	0.00
29-Sep	48	82.1	65.8	0.00
30-Sep	49	73.8	63.1	0.00
1-Oct	50	84.9	60.5	0.00
2-Oct	51	95.3	68.6	0.00
3-Oct	52	79.1	69.5	0.00
4-Oct	53	75.6	53.5	0.00
5-Oct	54	63.4	49.9	0.00
6-Oct	55	74.4	53.5	0.00
7-Oct	56	84.0	65.5	0.00
8-Oct	57	69.1	61.4	0.00
9-Oct	58	61.9	53.8	0.01
10-Oct	59	73.8	52.2	0.00
11-Oct	60	67.4	49.8	0.00
12-Oct	61	75.9	44.8	0.00
13-Oct	62	67.3	52.9	0.17
14-Oct	63	75.3	51.4	0.01
15-Oct	64	70.9	45.3	0.00
16-Oct	65	69.8	51.3	0.88
17-Oct	66	60.7	50.6	0.01
18-Oct	67	60.3	40.3	0.00
19-Oct	68	65.0	34.8	0.00
20-Oct	69	61.8	46.4	1.90

Date	DAT	Temp °F		Rainfall (in)
		Max	Min	
21-Oct	70	66.0	53.7	0.00
22-Oct	71	68.4	58.4	0.11
23-Oct	72	65.7	44.5	0.01
24-Oct	73	69.8	38.8	0.00
25-Oct	74	69.7	45.0	0.00
26-Oct	75	66.2	55.0	0.00
27-Oct	76	79.5	61.5	0.23
28-Oct	77	66.0	48.0	0.00
29-Oct	78	63.4	50.7	0.00
30-Oct	79	66.7	49.8	0.00
31-Oct	80	79.6	61.9	0.03
1-Nov	81	74.7	37.5	0.57
2-Nov	82	56.2	32.4	0.00
3-Nov	83	53.5	31.6	0.00
4-Nov	84	59.9	29.3	0.00
5-Nov	85	68.3	43.9	0.00
6-Nov	86	57.7	34.9	0.00
7-Nov	87	62.9	34.3	0.05
8-Nov	88	47.0	28.1	0.00
9-Nov	89	45.7	22.4	0.00
10-Nov	90	57.6	26.2	0.00
11-Nov	91	68.5	42.5	0.00
12-Nov	92	59.4	29.1	0.46
13-Nov	93	35.4	20.0	0.00
14-Nov	94	48.8	19.3	0.00
15-Nov	95	51.0	39.1	0.05
16-Nov	96	44.6	38.1	0.00
17-Nov	97	43.8	35.4	0.02
18-Nov	98	46.3	36.7	0.00
19-Nov	99	52.4	37.0	0.01
20-Nov	100	52.0	38.4	0.00
21-Nov	101	53.1	35.2	0.00
22-Nov	102	55.1	34.0	0.21

Temperature and Rainfall from August 12 to November 22, 2019; Transplant to Final Harvest



Additional Trial Photos



Cauliflower trial on first day of harvest, October 30, 2019.



Candid Charm on October 30, 2019.