Cabbage Variety Trial
Fall 2018

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Field experimental design and crop management

Location: Tifton, GA

Entries: 9

Table 1. List of varieties.

Treatment	Variety
1	Bajonet
2	Artost
3	Expat
4	Bruno
5	Ramada
6	Bronco
7	3159
8	Bravo
9	Cheers

Planting date and spacing: 09/21/2018

Seeds were planted into 200-cell trays filled with soilless media on 08/15/2018 and greenhouse grown up to transplanting (09/21/2018). Transplants were planted on 6-in raised beds spaced at 6-ft center. Double rows 18-in spaced were used with 12-in in-row spacing for a plant population of 14,520 plants per acre.

Plot size:

Plots were comprised by 20 plants with 4 replication per variety arranged as a randomized complete block design.

Pest management:

A 3 days pre-planting application of Gold 2XL (2 pints/ac) was performed with bed preparation in the beginning of cabbage season for weed control. After transplant establishment, weekly application of Exirel (13.5-20.5 fl oz/ac), Bravo (1 pint/ac) rotate with Quadris (6-8 oz./ac), and Fontelis (12-16 oz/ac) was conducted to avoid insect and diseases pressure.

Fertilizer management:

Cabbage was fertilized with 500 lbs./acre of 10-10-10 (NPK) at planting and at 18 days after planting. In addition, two more fertilizer applications with 387 lb./acre of 15.5-0-0 (NPK) at 38 and 52 days after planting were performed. A total of 230, 100 and 100 lbs. per acre of N, P and K was applied throughout the crop development, respectively.

Irrigation management:

Irrigation water was overhead applied. After transplant, water was daily applied at an irrigation depth of 0.2-in for 30 days to ensure plant establishment. After this point, water was applied every 2 days according to the crop evapotranspiration. In the case of rainfall events, irrigation was seceded and returned after 3 days.

Data collection

There was a total of 9 entries on the cabbage variety evaluation of fall 2018 (Table 1). Total yield and external and internal characteristics of each variety were evaluated at the harvest time. External characteristics evaluated were head height and width, while internal characteristics were core height and width (Fig. 1).

Cabbage heads were harvested in December 18, 2018 and January 9, 2019. Only marketable heads (3 lbs. or more) were harvested in December 18, while all field remained heads were harvested in January 9. Heads heavier than 2 lbs. were classified as marketable yield, while heads smaller than 2 lbs. were classified as non-marketable yield. Subsamples of marketable heads (5) were collected from each variety to determine internal and external quality of heads.

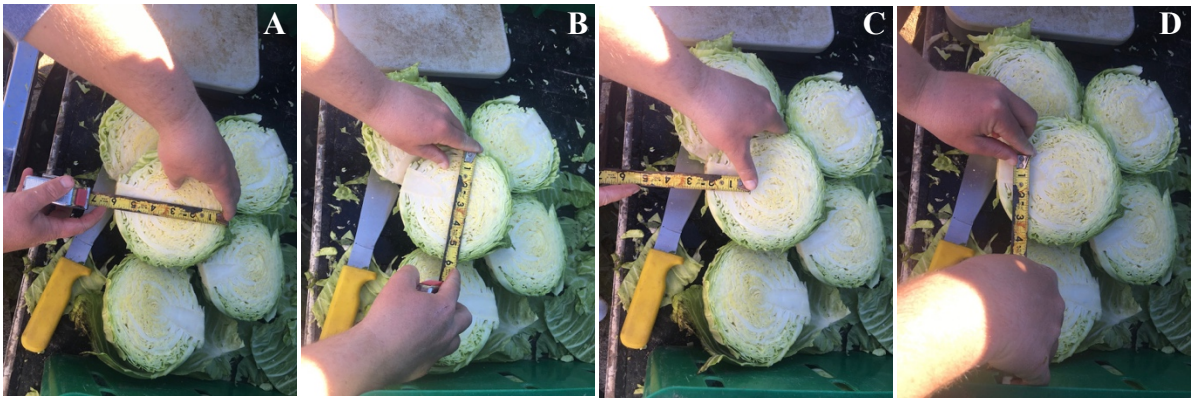

Figure 1. Mensuration of external and internal characteristics: height (A) and width of head (B), and height (C) and width of core (D).

Results

Fall cabbage was planted in September and harvested in December and January. Air temperatures were high early season but dropped later (Fig. 2). Overall, air temperatures varied between 59.5 and 78.4 °F, while average daily air temperature was 61.7 °F. These air temperatures were similar to the average recoded for the same period from 2007-2017 in which average daily air temperature was 58,1 °F. Rainfall accumulation in the fall cabbage season of 2018 (22.3 in) was 2-fold higher than the average recorded for the same period (2007-2017), which was 11.1 in.

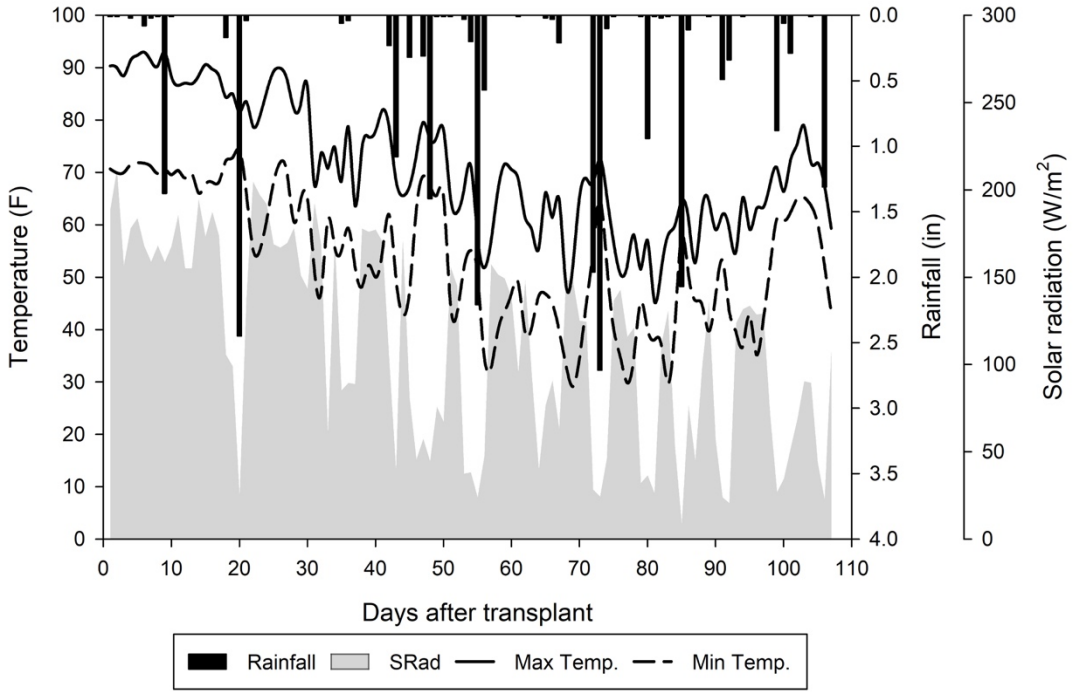

Figure 1. Weather conditions of fall cabbage season of 2018 (October to January) including maximum and minimum air temperature (°F), rainfall (in) and solar radiation (W m^{-2}) recorded at 15-min intervals. Data retrieved from Georgia Weather Network Systems at the Tifton, GA.

Total yield (Table 2) varied from 47,056 to 23,528 lbs./ac among all varieties evaluated in the fall cabbage season of 2018. The highest total yield was measured for Artost that had no significant difference from Bronco, Bravo, and Cheers (Table 1). Total yield results were consequence of weight of marketable head, which was the highest for Artost, Bronco, Bravo, Cheers, and Ramada and averaged 3.37 lbs per head (Table 3).

Regarding the first harvest, there were significant differences among all varieties, which averaged 14 % of total yield. Artost had the highest marketable yield (21,181 lbs./ac) while the variety 3159 had no harvestable heads (>2 lbs.) in the first harvest. Marketable yield for first harvest was higher in the order of Artost> Bravo> Ramada> Bajonet> Cheers> Bronco> Bruno> Expart> 3159. In the second harvest, the varieties Bronco, Bravo, and Cheers had the highest marketable yield, however, there was no significant difference among these varieties and the Ramada, Artost, and Bajonet, which all together averaged 24,131.25 lbs./ac. Marketable yield for second harvest was higher in the order of Cheers> Bronco> Bravo> Ramada> Bajonet> Artost> Expart> Bruno> 3159. Lowest marketable yields in the second harvest were measured for Expart, Bruno and 3159, which averaged 13,178.22 lbs./ac.

The evaluation of head quality (Table 3) showed that head height varied from 5.58 to 6.57 in. Bajonet had the highest head height with 6.57 in, but Bajonet had no difference from Artost (6.06 in), Bronco (6.36 in), Bravo (6.10 in), and Cheers (6.41 in). The head width was the highest for Bravo (6.91 in), although, it was similar to Expart (6.31 in), Ramada (6.39 in), Bronco (6.51 in), and Cheers (6.41 in). The cabbage variety Bajonet had the highest core height compared to all varieties. The Bajonet core height was 3.43 in. Core width had no significant difference among any variety evaluated and averaged 1.17 in.

Table 2. Market yield in the first and second harvest and Total yield measured at the harvest time for each variety treatment evaluated in the cabbage fall season of 2018.

Variety	Marketable yield 1st harvest	Marketable yield 2nd harvest	Unmarketable yield	Total yield
		lbs./ac		
Bajonet	5,100 b†	23,994 ab	5,584 bcd	34,678 bc
Artost	21,181 a	23,842 ab	2,032 d	47,056 a
Expat	980 b	15,572 bc	9,600 abc	26,152 cd
Bruno	1,234 b	14,538 bc	11,044 ab	26,816 cd
Ramada	5,390 b	24,556 ab	6,534 bcd	36,481 b
Bronco	1,796 b	32,924 a	5,644 bcd	40,365 ab
3159	0 b	9,413 c	14,114 a	23,528 d
Bravo	7,151 b	30,600 a	4,473 cd	42,225 ab
Cheers	2,069 b	36,537 a	4,473 cd	43,246 ab

†Values followed by similar letters within a column indicate no significant difference among variety treatments according to Tukey ($p < 0.05$) mean test.

Table 3. Head height, head width, core height, and core width measured at the harvest time for each variety treatment evaluated in the cabbage fall season of 2018.

Variety	Avg. marketable head	Head height	Head width	Core height	Core width
	lbs./ac	---------- inch ----------			
Bajonet	2.96 bcd†	6.57 a	6.06 b	3.43 a	1.31 a
Artost	3.47 ab	6.06 ab	6.18 b	2.54 bc	0.98 a
Expat	2.74 d	5.58 c	6.31 ab	2.88 b	1.26 a
Bruno	2.86 cd	5.71 c	5.88 b	2.75 bc	1.18 a
Ramada	3.08 abcd	5.87 bc	6.39 ab	2.81 bc	1.24 a
Bronco	3.40 abc	6.36 ab	6.51 ab	2.76 bc	1.09 a
3159	2.75 d	5.84 bc	6.16 b	2.66 bc	1.00 a
Bravo	3.59 a	6.10 abc	6.91 a	2.84 bc	1.28 a
Cheers	3.31 abcd	5.99 abc	6.41 ab	2.45 c	1.21 a

†Values followed by similar letters within a column indicate no significant difference among variety treatments according to Tukey ($p < 0.05$) mean test.