

**Report to the Oregon Processed Vegetable Commission
1993-1994**

1. Title: Cauliflower Variety Observation
2. Project Leaders: J.R. Baggett, Horticulture
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3. Project Status: Terminating June 30, 1994
4. Project Funding: \$3,500
\$2,301 supplementary technical support

Funds were used primarily for research farm expenses and labor for transplanting, breeding, and harvesting.

5. Objectives:

Evaluate head quality, maturity time, and total yield of eight promising cauliflower varieties over a range of planting times; screen additional cauliflower varieties to identify those having suitable characteristics for processing.

6. Report of Progress:

Three replicated plantings (two established by transplanting and one by direct-seeding) of three promising cauliflower varieties (Snowman, Starbright Y and Aubade) and the standard processed variety for western Oregon (Snowball Y Improved) were made at the Vegetable Research Farm in Corvallis. Unreplicated observational plantings also were made of a number of additional cauliflower varieties. The seedbed for the first transplanting (TP-1) was sown on 8 June, and the transplanting occurred on 15 July. For the second transplanting (TP-2), the seedbed was sown on 23 June and transplanting occurred on 30 July. The direct-seeded (DS) plot was sown on 17 June. Spacing of the plants was 1.5 ft. in 3-ft rows. About 450 lb/acre of 12-29-10 was banded prior to transplanting or direct-seeding. All plots were side-dressed with an additional 150 lbs/acre of N as Urea, 4 weeks after transplanting for the TP plots and 8 weeks after direct-seeding for the DS plots. Overhead irrigation was applied about once per week throughout the growing season. Heads were harvested weekly at a stage considered comparable to industry standards. Roughly 20 heads were harvested per plot. Data collected from the heads included weight and dimensions, internal and external color, presence of defects such as riciness, and structure of the head including chunkiness, solidity and curd depth.

The Snowball Y Improved produced in the TP-1 and the DS plots (Tables 1 and 5) were of very low quality; most heads had very poor color (lots of purple), core discoloration and riciness. Head weight was also low. The heads of Snowball Y Improved produced

in TP-2 (Table 9) were larger and had better color, but they still tended to be ricey. Head maturity of Snowball Y Improved was spread over a period of about 1 month.

Compared to Snowball Y Improved, Snowman produced heavier heads of superior white color (although a few showed some purpling). The cores were solid and white and riciness was minimal. The superior external appearance of the Snowman heads was most pronounced in the TP-1 and DS plantings. The heads of Snowman were more globe-like, and less chunky and dense than those of Snowball Y Improved. They matured 2 to 3 weeks later. As was the case for Snowball Y Improved, Snowman plots were cut over a 1 month period.

Starbright Y heads matured earlier (about 1 week) than Snowball Y Improved, and more uniformly (most were cut over a 2-week period). In the TP-1 and the DS plantings heads of Starbright Y were much whiter and far less ricey than those of Snowball Y Improved, but were inferior in color to those of Snowman. Heads of Starbright Y were lighter in weight, less dense and not as chunky as those of Snowman.

The observation trials indicated that McKinley and possibly Mariposa should be given further consideration, at least as early to mid-season varieties. In the TP-1 and DS plantings, both (but especially McKinley) produced heads that were superior to Snowball Y Improved in external appearance (whiter and less ricey) and weight. McKinley heads were particularly well covered with wrapper leaves. Mariposa matured about the same time as Snowball Y Improved, McKinley up to a week later. Neither appeared to be any more uniform in maturity than Snowball Y Improved. The heads of Mariposa and McKinley were not as dense or chunky as those of Snowball Y Improved or Snowman, but they were superior to those of Starbright Y. Both Mariposa and McKinley had been planted in the 1992 variety trial. At that time, the head structure of Mariposa was questionable, but McKinley looked good in the early (late June) transplanting.

7. Summary:

Two transplantings and one direct-seeded planting of cauliflower were made to study suitability of promising cauliflower varieties for processing. Snowman produced larger heads of better color and less riciness than the standard variety, Snowball Y Improved. However, Snowman heads were somewhat less solid and matured 2 to 3 weeks later. Starbright Y heads matured more uniformly than Snowball Y Improved and about one week earlier. Their color was superior to Snowball Y Improved but poorer than Snowman. The solidity score of Starbright Y heads was low.

8. Signatures:

Redacted for Privacy

Project Leaders:

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Department Head:

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Table 1. Cauliflower replicated trial, direct-seeded on June 16, head quality scores and yield, Corvallis, 1993.^z

Variety	Source ^y	Ext. Color	Globe Shape	Solidity	Fuzzy	Ricey	Core			Curd		Density ^x (g/cc)	Lbs/ Head	T/A ^v
							Hollow	Color	Ht.	Depth (cm)	Chunki- ness			
Snowman	1	3.8	3.6	3.8	1.6	4.9	3.4	4.1	3.5	1.6	3.7	.427	2.6	12.5
Starbright Y	2	3.4	4.3	2.5	4.6	4.8	5	4.7	3	1.2	2	.346	2	9.7
Snowball Y Improved	1	1	1.2	4.8	2	2.5	1.9	2.4	4.2	1.5	4.6	.425	2.1	10.2
Aubade	3	2.5	3.3	3.9	3.3	3.9	4.5	4	4.4	1.7	3.7	.415	1.5	7.3
LSD at 5%		0.8	1.0	0.4	1.1	0.8	0.5	0.9	1.0	0.2	0.5	.026	0.2	1.2

^zTransplanted 18" apart in rows 36" apart. All scores based on 1-5 scale with 5 best. All values are average of four replications with harvest date scores combined and weighted by the number of heads harvested at each date.

^ySources: 1 = Harris-Moran, 2 = Abbott & Cobb, 3 = Shamrock.

^xHead density is a relative value calculated from head weight and the volume of a box created by measurements of width and depth of head. Five heads were measured at each harvest (or less if fewer were harvested).

^vTons/acre adjusted to 20 plants/plot.

Table 2. Cauliflower head quality scores and yield, observation plots, direct-seeded on June 16, Corvallis, 1993.^a

Variety	Source ^b	Ext. Color	Globe Shape	Solidity	Fuzzy	Ricey	Core			Curd		Density ^c (g/cc)	Lbs/Head	T/A ^d	Notes
							Hollow	Color	Ht.	Depth (cm)	Chunkiness				
Mariposa	1	3.9	5	3.4	3.2	5	4.9	5	4.9	1.9	3.6	.392	3.9	18.8	heavy curds but open structure
Floriade	2	3.8	3.8	3	5	3.7	3.6	3.8	4.2	1.4	4	.365	2.7	12.9	good external color but tends to have internal green
Sierra Nevada	1	2.6	3.1	2.3	5	5	5	5	3.9	1.0	1.6	.329	1.5	7.4	internal green
Polar Cap	3	2.1	2.8	2.2	0.7	4.7	3.8	4.9	4.2	1.2	2	.327	2.2	10.9	exposed heads are bright yellow, internal green
PS500485	4	2.8	3.1	3.1	4.1	4.3	3	5	4.9	1.4	3.3	.434	2.6	12.5	heavy, lumpy heads
HMX 8178	5	4.4	4.4	2.7	5	5	5	5	2.6	1.3	1.6	.344	1.8	8.9	internal structure has many branches, shattering type
Cumberland	1	1.9	4.9	3.6	5	4.2	3.4	5	3.7	1.4	3.4	.374	1.6	7.9	last heads have sl. internal green
Andes	1	2.3	2.6	3	5	4.7	4.5	4.7	3.2	1.2	3.2	.361	1.4	6.8	
McKinley	1	4.1	4.1	3.5	1.3	5	3.8	4.3	5	1.6	3.7	.415	2.5	12.0	nice looking
Snowcone	3	2.8	2.3	3	5	5	4.6	5	2.5	1.1	2.5	.377	1.1	5.4	

^aDirect-seeded, then thinned to 18" apart in rows 36" apart. All scores based on 1-5 scale with 5 best. All values are average of four replications with harvest date scores combined and weighted by the number of heads harvested at each date.

^bSources: 1 = Royal Sluis, 2 = Shamrock, 3 = Ferry-Morse, 4 = Petoseed, 5 = Harris-Moran.

^cHead density is a relative value calculated from head weight and the volume of a box created by measurements of width and depth of head. Five heads were measured at each harvest (or less if fewer were harvested).

^dTons/acre adjusted to 20 plants/plot.

Table 3. Percent of total cauliflower heads harvested on harvest days, replicated varieties, direct-seeded on June 16, Corvallis, 1993.²

Variety	Days from Planting						
	78	85	92	99	106	113	120
Snowman				32	35	19	14
Starbright Y	21	41	23	8	7		
Snowball Y Improved		37	37	18	4	4	
Aubade	63	30	2	4	1		

²Percentage based on total of four replications.

Table 4. Percent of total cauliflower heads harvested on harvest days, observation plots, direct-seeded on June 16, Corvallis, 1993.²

Variety	Days from Planting						
	78	85	92	99	106	113	120
Mariposa		16	47	32	5		
Floriade		5	57	9.5	19	9.5	
Sierra Nevada		20	46.6	26.6	6.6		
Polar Cap		28	33	28	16		
PS500485			20	70	10		
HMX 8178			40	60			
Cumberland	17	55	22	6			
Andes	15	54	23	8			
McKinley		6	11	55	11	17	
Snowcone		26	37	37			

²Percentage based on a single plot of each variety.

Table 5. Cauliflower replicated trial, transplanted on July 15, head quality scores and yield, Corvallis, 1993.²

Variety	Source ¹	Ext. Color	Globe Shape	Solidity	Fuzzy	Ricey	Core			Curd		Density ² (g/cc)	Lbs/Head	T/A ³	Notes
							Hollow	Color	Ht.	Depth (cm)	Chunkiness				
Snowman	1	3.9	3.5	3.8	1.7	4.8	3.2	3.9	3.2	1.6	3.6	.415	3.6	17.5	occasional purple fuzz
Starbright Y	2	3.2	3.9	2.5	4.4	4.7	5	5	3.1	1.3	2	.335	2.6	12.7	some internal green
Snowball Y Improved	1	2.2	1.5	4.9	1.6	2.2	2.9	3.3	3.3	1.5	4.9	.447	2.4	11.7	some with poor external and internal color
Aubade	3	2.6	2.8	3.4	2.6	3.9	5	5	3.5	1.6	3.4	.408	2.1	10.4	internal green in earliest heads
LSD at 5%		0.6	0.5	0.4	0.7	0.6	0.5	0.4	NS	0.2	0.4	0.02	0.3	1.5	

¹Transplanted 18" apart in rows 36" apart. All scores based on 1-5 scale with 5 best. All values are average of four replications with harvest date scores combined and weighted by the number of heads harvested at each date.

²Sources: 1 = Harris-Moran, 2 = Abbott & Cobb, 3 = Shamrock.

³Head density is a relative value calculated from head weight and the volume of a box created by measurements of width and depth of head. Five heads were measured at each harvest (or less if fewer were harvested).

⁴Tons/acre adjusted to 20 plants/plot.

Table 6. Cauliflower head quality scores and yield, observation plots, transplanted on July 15, Corvallis, 1993.*

Variety	Source [†]	Ext. Color	Globe Shape	Solidity	Fuzzy	Ricey	Core			Curd		Density* (g/cc)	Lbs/Head	T/A [‡]	Notes
							Hollow	Color	Ht.	Depth (cm)	Chunkiness				
Mariposa	1	4.2	4.8	3.2	3.9	5	5	5	4.3	18.3	2.8	.397	3.4	16.4	
Floriade	2	4.4	3.5	2.9	4.2	4.8	3.5	3.5	3.7	12.7	2.2	.371	3	14.4	
Sierra Nevada	1	3.2	3.6	2.2	5	4.9	5	5	2.3	12.6	1.6	.350	2.8	13.7	
Polar Cap	3	3.6	4.5	2.5	2.5	4.4	5	5	3.7	13.8	2.3	.369	3	14.5	earliest heads with internal green
PSS00485	4	2.8	3.7	3.5	5	4	4.3	4.9	3.9	14.8	3.3	.402	3.6	17.7	heads tend to be spongy, have external grayish tinge and grainy texture, and internal green
Cumberland	1	3.8	4.4	3.4	4.7	4.8	5	5	4.2	15.0	2.8	.380	3	14.6	very nice looking
Andes	1	2.2	3.7	2.9	5	4.5	5	5	3	12.5	2.2	.369	2	9.3	latest heads bright yellow
McKinley	1	4.2	4.6	3.4	1.1	4.9	5	5	3.7	16.9	2.9	.387	3.5	16.7	heads somewhat lumpy, very heavy, internal color very white
Snowcone	3	3.4	3.5	2.9	5	4.9	4.5	5	2.8	15.3	1.5	.368	2.5	11.6	shattering type, some internal green

*Transplanted 18" apart in rows 36" apart. All scores based on 1-5 scale with 5 best. All values are average of six replications with harvest date scores combined and weighted by the number of heads harvested at each date.

†Sources: 1 = Royal Sluis, 2 = Shamrock, 3 = Ferry-Morse, 4 = Petoseed.

‡Head density is a relative value calculated from head weight and the volume of a box created by measurements of width and depth of head. Five heads were measured at each harvest (or less if fewer were harvested).

§Tons/acre adjusted to 20 plants/plot with 2 plots averaged.

Table 7. Percent of total cauliflower heads harvested on harvest days, replicated varieties, transplanted on July 15, Corvallis, 1993.²

Variety	Days from Transplanting								
	50	57	64	71	78	85	92	99	106
Snowman			2	12	25	27	19	10	5
Starbright Y	19	50	18	8	4		1		
Snowball Y Improved	3	29	34	17	6	4	3	4	
Aubade	68	23	2	3			2	1	1

²Percentage based on six replications.

Table 8. Percent of total cauliflower heads harvested on harvest days, observation plots, transplanted on July 15, Corvallis, 1993.²

Variety	Days from Transplanting								
	50	57	64	71	78	85	92	99	106
Mariposa		20	32.5	27.5	10	7.5	2.5		
Floriade		27.5	50	15	2.5		2.5		
Sierra Nevada		3	25.5	31	25.5	15			
Polar Cap	5	10	13	18	23	18	10	3	
PS500485			3	15	56	18	5	3	
Cumberland	7	44	27	17	5				
Andes	5	52.5	32.5	2.5	7.5				
McKinley		15	42.5	27.5	7.5	7.5			
Snowcone	2.3	56	32	5	2.3	2.3			

²Percentage based on two plots of each variety.

Table 9. Cauliflower replicated trial, transplanted July 30, head quality scores and yield, Corvallis, 1993.^a

Variety	Source ^b	Ext. Color	Globe Shape	Solidity	Fuzzy	Ricey	Core			Curd		Density* (g/cc)	Lbs/Head	T/A ^c
							Hollow	Color	Ht.	Depth (cm)	Chunkiness			
Snowman	1	4	3.2	4	2.2	4.1	3	4	3.5	1.6	3.3	.414	3.2	15.5
Starbright Y	2	3.9	4.3	2.1	5	5	5	5	1	1	1.2	.315	3	14.6
Snowball Y Improved	1	3.8	1.9	4.3	3.4	2.6	2.7	3.1	3.6	1.4	4.6	.423	2.9	13.8
Aubade	3	3.9	3.6	3.4	5	5	4.9	5	2.5	1.4	2.7	.398	2.4	11.5
LSD at 5%		NS	.6	.3	.5	.4	.7	.5	.6	.1	.6	.016	.4	1.8

^aTransplanted 18" apart in rows 36" apart. All scores based on 1-5 scale with 5 best. All values are average of six replications with harvest date scores combined and weighted by the number of heads harvested at each date.

^bSources: 1 = Harris-Moran, 2 = Abbott & Cobb, 3 = Shamrock.

^cHead density is a relative value calculated from head weight and the volume of a box created by measurements of width and depth of head. Five heads were measured at each harvest (or less if fewer were harvested).

^dTons/acre adjusted to 20 plants/plot.

Table 10. Cauliflower head quality scores and yield, observation plots, transplanted July 30, Corvallis, 1993.*

Variety	Source ¹	Ext. Color	Globe Shape	Solidity	Fuzzy	Ricey	Core			Curd		Density ² (g/cc)	Lbs/Head	T/A	Notes
							Hollow	Color	Ht.	Depth (cm)	Chunkiness				
Mariposa	1	3	4.4	3	5	4.9	5	5	2.1	13.3	2.1	.389	3.1	14.8	
Floriade	2	3.6	2.9	2.7	5	5	3.5	4.7	2.7	13	2.1	.338	2.7	13	internal green
Sierra Nevada	1	3.5	4.8	2.2	4.9	3.9	5	5	2	10.8	1	.332	2.9	14.1	internal green, shattering type
Polar Cap	3	2.8	3.9	2.5	4.4	5	4.3	4.6	3.3	11.5	1.8	.355	3.5	16.8	some internal green
PSS00485	4	4	3.3	3	5	4.5	2.3	3	5	19.8	2.8	.453	3.1	15.2	external grainy appearance, shattering type
Cumberland	1	3.4	4.2	2.8	5	4.7	4.8	5	3.3	13	1.7	.377	4	19.5	
Andes	1	3.3	3.6	2.7	5	5	5	5	3.1	11.4	2.1	.335	2.5	12.1	internal green in later heads
Snowcone	3	3.7	3	3	5	5	3.7	5	2.3	12.8	1.7	.313	2.4	11.5	

Transplanted 18" apart in rows 36" apart. All scores based on 1-5 scale with 5 best. All values are average of six replications with harvest date scores combined and weighted by the number of heads harvested at each date.

Sources: 1 = Royal Sluis, 2 = Shamrock, 3 = Ferry-Morse, 4 = Petoseed.

Head density is a relative value calculated from head weight and the volume of a box created by measurements of width and depth of head. Five heads were measured at each harvest (or less if fewer were harvested).