

Field Evaluation of Cauliflower Varieties Grown in Southwest Low Desert Soils

Mohammed A. Zerkoune, Extension Agent, Yuma County Cooperative Extension, University of Arizona

Abstract

Selection of adapted varieties to environmental factors and soil types are paramount to growing profitable cauliflower crops. Varieties are selected for uniform maturity, field holding capability, head size, shape and color. The objective of this demonstration trial is to evaluate new and existing commercial varieties under standard field conditions. Seven varieties were planted in a single row and evaluated at Yuma Agricultural Research Center (YAC) for their agronomic characteristics and their commercial values. All varieties tested performed well with an overall rating of 4 or better, indicating that when planted under similar conditions and planting dates, these varieties are expected to do well. However a significant head weight and head diameter difference was observed among varieties tested.

Introduction

Yuma producers grow over 3,600 acres of cauliflower that contributed more than \$35,000,000 to the county's economy. Continuous efforts are made by the seed industry and growers to improve cauliflower production. Variety selection and crop management practices are the main factors that contribute to growing profitable cauliflower. Desirable agronomic qualities of cauliflower include uniform maturity and size, good holding capability and acceptable disease resistance. Market values include color, uniformity, dome-shaped head and minimum raciness and fuzziness. It is also desirable that heads have wrapper leaves as protection from sun exposure. Uniform maturity, so that harvesting operations can be completed in a timely fashion, is another characteristic of interest to growers. Head size uniformity is necessary so growers can pack a consistent number of heads per box.

The objectives of this demonstration were to evaluate cauliflower varieties submitted by seed companies, and to allow growers and others to perform their own evaluations.

Methods and Materials

Palmer, Sekata and Bejo seed companies participated in the University of Arizona cauliflower variety trial in 1999-2000. The Yuma Agricultural Research Center was the selected site to conduct this trial. We planted eight varieties in a completely randomized block design with two replications. We used an Earthway® hand push planter to plant all varieties in single rows per bed on October 15, 1999. This was done using a 42-inch spacing and 50-ft long rows with a north-south orientation. A furrow irrigation was made the day following planting. Standard cultural and IPM practices were utilized throughout the growing season. A commercial crew thinned all plots to a 10-inch spacing.

All varieties had varying growth rates. Plant characteristics were evaluated over a period of time during the growing season. Most growth parameters were evaluated on a 1 to 5 scale with 1 as the least desirable. Parameters evaluated otherwise are explained in Table 1. Parameters rated on 1 to 5 scale were averaged to

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give the overall rating. Varieties with an overall rating of 4 and 5 are expected to grow well under similar conditions. Varieties with overall rating of 3 and below may experience some problems. Head weight and head diameter measurements were made at maturity for each variety planted. Five heads per variety were harvested, trimmed and weighed individually as sub-samples to evaluate head quality and diameter uniformity. Statistical analysis (SAS ver.7) was performed on head weight and head diameter. Table 1 shows the results of our analysis of variance (ANOVA).

Results and Discussion

All cauliflower varieties tested in 1999-2000 growing season performed well. The overall rating for all varieties was greater than four (Table 1), indicating that all these varieties tested will do well under similar growing conditions and planting date. No incidence of disease was observed among varieties tested. No significant difference in Variety*sampling interaction indicating overall all varieties sampled for head weight and head diameter were uniform. Cauliflower varieties tested at Yuma Agricultural Center showed a significant head weight and diameter differences (Table2). Fuego had the highest head weight and Incline the smallest. Bejo 1704 and Incline had the highest head diameter and Fuego had the smallest head diameter. Table 1 shows Fuego and Bejo had a high score in curd density and firmness while Incline had the lowest curd density and firmness score.

Table1. Analysis of variance for head weight and head size of cauliflower variety grown at Yuma Valley research center in 1999-2000.

Source of variation	DF	Head weight	Head diameter
		Pr.>F	Pr.>F
Rep	1	0.077	0.0001
Variety	6	0.067	0.019
Variety*sample	28	0.788	0.925
R2		0.52	0.64
CV (%)		26.71	10.0
Mean Comparison			
Variety		Head weight	Head diameter
Fuego (Bejo)		1530a [†]	8.00c
White Snow		1460ab	8.50bc
Bejo 1704 (Bejo)		1320abc	9.4a
Candid (Sakata)		1310abc	8.70abc
Bejo 1703 (Bejo)		1190bc	8.70abc
White Maya (Sakata)		11.65bc	8.95ab
Incline (Sakata)		1150c	9.3a

[†] Means followed by same letters are not significantly different at 10% alpha level

Table 2. Evaluation of Cauliflower varieties grown at Yuma Valley Research Center

Variety			O verbal rating (a)	Uniformity of maturity (a)	Stand Uniformity (a)	Head Shape (b)	Color (a)	Uniform color (a)	Curd Density (a)	Curd firmness (a)	Field Holding ⁹ a)	Wrapper leaves (a)	Weight (gram)	Uniformity (a)	Plant Height (in)	Riciness (a)	Fuzziness(a)	Incidence of disease (a)	Maturity at Harvest (c)	Key a) 5= most desirable, 1= undesirable b) D=dome, F= flat dome, P= peak c) d) M=mature, U=under, O= over Comment
Fuego (Bejo)	1	1	4.2	M	4	M	4	4	5	4	4	5	1680	4	8	4	4	4	M	Nice size but pink color, not firm
Bejo 1703 (Bejo)	2	1	4.4	M	4	M	4	4	5	4	5	5	1220	4	7.8	4	4	5	M	Some pink color, but good size and uniform
Bejo 1704(Bejo)	3	1	4.75	M	5	E	4	4	5	5	5	5	1060	4.5	9	5	5	5	M	Early variety, uniform, and good color
Incline (Sakata)	4	1	4.2	M	5	M	4	4	4	4	5	5	1160	4	8.8	4	4	4	M	head not uniform, head not firm
Candid (Sakata)	5	1	4.95	M	4	M	4.5	5	5	5	5	5	1300	5	7.8	5	5	5	M	nice color, lack of uniformity
White Maya (Sakata)	6	1	4.9	M	5	D	4	5	5	5	5	5	1070	5	8.4	5	5	5	M	Good looking and firm
White Snow (field variety)	7	1	4.3	M	4	S	5	4	4	4	5	5	1160	4	8.2	4	4	4	M	pink color not firm