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by

James V. Davis	Research Associate, Soil Chemistry
D. R. (Ron) Earhart	Research Associate, Vegetables
Vincent A. Haby	Associate Professor, Soil Chemistry
Allen T. Leonard	Research Assistant, Soil Chemistry
Elizabeth W. Neuendorff	Research Associate, Fruits
Gary H. Nimr	Technician II, Fruits
Miguel A. Palacios	Graduate Student, Roses
Kim D. Patten	Assistant Professor, Fruits
H. Brent Pemberton	Associate Professor, Roses
Stanley C. Peters	Formerly, Technician I, Fruits
William E. Roberson	Technician I, Roses
Ruth A. Taber	Research Scientist, Plant Pathology, College Station
Glenn C. Wright	Graduate Student, Fruits

Texas A&M University Agricultural Research
and Extension Center at Overton

Texas Agricultural Experiment Station
Texas Agricultural Extension Service

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STATE ORIENTAL VEGETABLE TRIALS - 1988

D. R. Earhart, J. V. Davis, A. T. Leonard, and V. A. Haby

INTRODUCTION

The population of Asian Americans living in Texas is quite large. The majority live in the metropolitan centers of Houston, San Antonio, and Dallas/Ft. Worth. The Texas market for Oriental vegetables is increasing. Most of these vegetables are imported to Texas from California, Florida and Hawaii (Yamaguchi M., 1973). Additional demand for Oriental vegetables will probably occur as new research evidence supports the health benefits of vegetables and fruit along with the National Cancer Institute's recommendations to eat more fruit and vegetables (Ritenbaugh, 1987).

In Spring 1988, a "Specialty Crops Committee" was formed within the Texas A&M University System to investigate production of Oriental vegetables in Texas. The goals of this committee were 1) to evaluate the performance of cultivars of several Oriental vegetables under Texas conditions, 2) to develop cultural practices for optimum yield and quality, and 3) to evaluate market responses to these vegetables. The State Oriental Vegetable Trials were established in order to answer questions concerning these goals. Previous research on the nitrogen and boron requirements of Chinese cabbage and mustard had been conducted at the Texas Agricultural Experiment Station at Overton.

MATERIALS AND METHODS

A block of several varieties of selected Oriental vegetables was planted for evaluation on a Bowie fine sandy loam at Overton in late summer of 1988. The plot area used for this experiment was fumigated with methyl bromide at 230 lbs a.i./ac on 12 August 1988. The plastic tarp was removed after three days. The soil was disked and allowed to aerate. On 22 August 1988, the soil was fertilized by broadcast application of 104 lb each of N, P_2O_5, and K_2O per acre. The soil was then bedded to 40 in. centers. The replicated part of the test was a randomized complete block design with 4 replications. The first planting was made on 23 August from transplants started in the greenhouse on 1 August, except for Chinese radish, Chinese peas, bitter melon, asparagus bean, and Chinese okra which were direct seeded. The in-row spacing varied among entries (Table 1). Each plot was 25 ft. long. A second planting was made on 15 Sept. 1988. Two weeks after emergence,

plants were thinned to the spacings used in the 23 August planting. Trickle irrigation, but no insecticides or fungicides were used. Evaluations included yield and size data.

DISCUSSION

There were significant yield differences among Chinese cabbage varieties (Table 2). Tropical Delight and Magica tended to yield more in the August planting, but the Napa Hybrid and Jade Pagoda produced statistically similar yields. Tropical Delight was the lowest yielder in the September planting. In comparing the two planting dates, there was almost a reversal in yield among varieties with Jade Pagoda and Napa Hybrid showing higher yields when compared to Tropical Delight and Magica. This could be explained by the fact that Tropical Delight and Magica reach their maximum growth in less days and the other varieties continued sizing.

Chinese mustard exhibited some of the same growth trends as the Chinese cabbage (Table 3). Yield appeared to be a function of head size. Also, the length of time from planting to harvest was a factor. Even though the yield was greater in the September planting due to growing time, visual quality was equal.

Increased yield of Chinese radishes was due to root weight (Table 4). Top yield and size of root also followed this pattern. Chinese radish tops were evaluated because they are also edible as are the seed pods produced when flowering occurs (Harrington, 1984). Of the four varieties, only Chinese White produced flowers. These flowers did not adversely affect root quality. Days to harvest also affected yield of Chinese radish. The difference between 64 and 70 days growth showed a 50-75% increase in yield which was due to root size. Even though these roots were huge when compared to common radishes, they did not exhibit the pithiness which is associated with currently accepted radishes. The quality was excellent whether harvested at 64 days or 70 days. Minowase became milder with age.

Numerical data were not obtained for the observational part of the trial. The varieties of Chinese okra (Luffa gourd), asparagus bean (Yard Long) and Bitter Melon are more adapted to spring plantings. Each produced a small amount of fruit, but this was not enough for quantitative or qualitative evaluation. The Chinese mustard variety and Japanese white celery were of very poor quality and would not be recommended for production. Chinese kale (Green Lance) had an attraction for many species of damaging insects (aphids, cabbage worms, etc.). This was very unusual since there was no significant insect problem on any of the other crops. Chinese cabbage (Bouquet) exhibited germination problems that caused a reduction

in the number of transplants for the August planting and reduced stand in the September planting.

CONCLUSIONS

Several of these Oriental vegetables show potential for alternate or new crop production in East Texas. In the replicated part of the trial, no individual variety proved best. Each has the potential for producing only a certain size product (head, root) and so would have to be compared to other varieties having the same production characteristics. Also, these vegetables have varying taste, color, and growth habits (cylindrical, round, long, short, red, white, etc.) which would be more in the order of consumer preference and would have to be evaluated by qualitative criteria. Further investigations are needed concerning plant populations, fertility, and intercropping, along with market evaluations.

LITERATURE CITED

1. Harrington, Geri. 1984. Grow your own Chinese vegetables. 1st ed. Garden Way Pub. Pownal, Vermont.
2. Marsh, Dyremple B. 1988. Production of specialty crops for ethnic markets in the United States. HortScience 23(3):628.
3. Ritenbaugh, Cheryl. 1987. Nutrition Today 22(1):14-20.
4. Yamaguchi, M. 1973. Production of Oriental vegetables in the United States. HortScience 8(5):362-370.

Table 1. Entries and field spacing of the replicated and observational Oriental vegetables.

Common name	Scientific name	Variety	Spacing (in)
REPLICATED			
Chinese cabbage (Pai-tsai)	*Brassica rapa* L. Pekinensis	Magica	10-12
		Jade Pagoda	10-12
		China Pride	10-12
		Tropical Delight	10-12
		Napa Hybrid (50 day)	10-12
Chinese mustard (Bok-choi)	*Brassica rapa* L. Chinensis	Lei Choi	6-8
		Meiquing Choi	6-8
		What-A-Joy	6-8
Chinese radish (Diakon)	*Raphanus sativas* L. Longipinnatus	Chinese Rose	3-4
		Minowase	3-4
		Tae-Baek	3-4
		Chinese White	3-4
OBSERVATIONAL			
Chinese mustard (Pak-choi)	*Brassica rapa* L. Chinensis	Japanese White Celery	4-6
Chinese kale (Gai-lon)	*Brassica oleracea* L. Alboglabra	Green Lance	6
Chinese cabbage (Pe-tsai)	*Brassica rapa* L. Pekinensis	Bouquet	10
Chinese okra (Cee-gwa)	*Luffa acutangula* L.	Luffa Gourd	12 (Trellis)
Asparagus bean (Dow guale)	*Vigna unguiculata sesquipedalis* L.	Yard-long Bean	6-12 (Trellis)
Bitter melon (Foo gwa)	*Momordica charantia* L.	Bitter Melon	12 (Trellis)
Chinese peas (Ho lohn dow)	*Pisum sativum* L. Macrocarpon or saccharatum	How Lohn Dow	1 (Trellis)
Chinese Peas (Ho lohn dow)	*Pisum sativum* L. Macrocarpon or saccharatum	Oregon Sugar	2-3

Table 2. Yield and average head size of 5 Chinese cabbage varieties planted on 2 different dates at Overton.

Variety	Yield per acre (tons)	Average head size (lbs)	Days to Harvest[z]
	PLANTING 1 (23 August 1988)		
Tropical Delight	25.0	3.9	64
Magica	25.0	3.8	64
Napa Hybrid	22.0	3.4	64
Jade Pagoda	18.0	2.7	64
China Pride	14.0	2.1	64
L.S.D. $_{.05}$	9.0	1.4	
	PLANTING 2 (12 Sept. 1988)		
Jade Pagoda	33.0	5.0	75
Napa Hybrid	31.0	4.7	75
China Pride	27.0	4.1	75
Magica	26.0	4.0	75
Tropical Delight	23.0	3.6	75
L.S.D. $_{.05}$	8.0	1.2	

[z]After transplanting for the 1st planting and after seeding for the 2nd planting.

Table 3. Yield and average head size of 3 Chinese mustard varieties planted on 2 different dates at Overton.

Variety	Yield per acre (tons)	Average head size (lbs)	Days to harvest[z]
	Planting 1 (23 August 1988)		
Mequing Choi	5.0	0.40	31
What-A-Joy	5.0	0.39	31
Lei Choi	4.0	0.34	31
L.S.D. $_{.05}$	2.0	0.15	
	Planting 2 (12 Sept. 1988)		
What-A-Joy	50.0	3.8	70
Lei Choi	39.0	3.0	70
Mequing Choi	32.0	2.4	70
L.S.D. $_{.05}$	13.0	1.0	

[z]After transplanting for the 1st planting and after seeding for the 2nd planting.

Table 4. Total yield, top yield, root weight and root size of 4 Oriental radishes (Diakon) planted on 2 different dates at Overton.

Variety	Yield per acre (tons)	Average root weight (lbs)	Top Yield per acre (lbs)	Average Root Size Length (in.)	Average Root Size Diameter (in.)	Days to Harvest[y]
		Planting 1 (23 August 1988)				
Chinese White	23.0	1.8	1,307	9.0	3.3	64
Tae-Baek	22.0	1.7	1,202	7.0	3.2	64
Minowase	21.0	1.7	941	14.0	2.3	64
Chinese Rose	13.0	1.0	836	6.4	2.3	64
L.S.D. .05	3.0	0.2	329	1.5	0.6	
		Planting 2 (12 Sept. 1988)				
Minowase	42.0	2.4	-[z]	-	-	70
Tae Baek	33.0	2.2	-	-	-	70
Chinese White	24.0	1.9	-	-	-	70
Chinese Rose	17.0	1.3	-	-	-	70
L.S.D. .05	8.0	1.0	-	-	-	

[z]Data not taken on 2nd planting.

[y]After seeding.