

Pepper Variety Trial Safford Agricultural Center, 1998

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Abstract

Eight varieties of bell peppers, three varieties of long green chile, two varieties of jalapeños, two varieties of yellow wax and one Serrano pepper were grown in a replicated small plot trial on the Safford Agricultural Center in 1998. Varieties were picked regularly during the growing season.

Introduction

Various types of pepper have been grown by homeowners and farmers in Graham County, but suffer from the salinity in the soil and irrigation water. As more area farmers are looking for crops to provide an alternative from the cotton monoculture, it was decided to evaluate several pepper varieties to find which ones would do best under our salty soil and arid growing conditions. This trial is one of many vegetable crop variety studies conducted at the Safford Agricultural Center in 1998.

Materials and Methods

This variety trial was performed on the Safford Agricultural Center at an elevation of 2954 feet above sea level. Bean seeds of the twelve varieties were planted in replicated small plot trials. Soil sulfur was worked into the beds and the plots were pre-irrigated to start the remediation process. Cultural practices and inputs are listed below in the crop history.

Crop History:

Soil type: Pima clay loam variant

Previous crop: Vegetables

Experimental design: Randomized complete block with 4 replications

Planting date: Transplanted - 13 April 1998

Plant spacings: 12 inches between plants on 36 inch beds (Plant population 14,520 plants/acre)

Fertilizer: 400 pounds/ac soil sulfur and 244 pounds/ac 16-20-0 applied 3/13, 100 pounds/ac urea applied 5/28

Irrigation: Watered up, furrow irrigated 9 times (ca. 36 inches of water)

Herbicide: None

Insecticide: None

Harvests were done manually starting when fruit from each variety matured. Fruit was weighed and counted to determine the number of fruits per plant an average fruit weight.

Analyses from saturated paste extracts from the experimental field and a typical water sampling from the irrigation well are included below:

Sample	pH	Electroconductivity	Total Dissolved Solids	ppm Na	Estimated SAR
Soil 0-2 inches	7.81	6.42	4109	1020	9.9
Soil 6-8 inches	8.34	1.86	1190	322	6.0
Well water	7.53	2.06	1318	366	7.35

Results and Discussions

Peppers are less sensitive to salt than beans (1) but are still moderately sensitive to salinity. Salinity threshold value for electroconductivity of 1.5 and a slope of 14. Using the formula $Y_r = 100 - B(K_e - A)$, where Y_r is the relative yield, A is the salinity threshold, B is the slope or percent yield decrease per unit salinity increase above the threshold and K_e is the electroconductivity of the saturated soil paste, the yield potential for peppers under field conditions can be calculated. With these values it is determined that $Y_r(0 - 2") = 31.1\%$ and $Y_r(6-8") = 95.0\%$. This shows the importance of planting deep and irrigating every other row to push the salts away from the plant roots.

Table 1 gives the yield data by variety for the bell pepper varieties. The first column indicates a relative maturity of the variety. Flamingo, the yellow fruited variety, was the earliest maturing with all of the green varieties maturing about the same. Karma, the variety with the highest yield, was also the largest fruited variety. The final value of the crop depends on market price at the time of harvest and the quality of the crop in addition to per acre yield. Size also make a difference with larger fruit generally having a higher value than smaller fruit. In the current market (2), yellow fruit were valued at \$16.50 to \$26.50 and the green fruit at \$9.50 to \$10.50 per 1 1/9 bushel cartons for extra large fruit. The Flamingo fruit size was not extra large, but even with a size discount would have produced more income per acre than Karma. The bell peppers grew and produced well and could be a viable crop for the area if the proper infrastructure and marketing were developed.

Table 2 shows the yield data for the other pepper varieties. Few varieties of each type of chile pepper were tested in the trial, but give an idea of the yields to be expected and how these varieties compared. The Jalapeño and Yellow wax pepper produced quite well with yields nearly double that of the long green or Anaheim-type chiles. It is not surprising that the long green chile did not perform well in the warm, salty environment in the area. Research done in 1993 (3, 4, 5) showed that AZ 20 yielded 70% as much as it did in Greenlee county where the summer growing season is slightly cooler and the soils slightly less salty and 30% as much in as in Cochise county where the summer growing season is around 5 degrees cooler and the salts are not a problem.

It is possible that Jalapeño and Yellow Wax peppers could be a viable crop as well as Bell peppers if infrastructure and marketing were developed.

References

1. Maas, E.V. 1986. Salt tolerance of plants. Applied Agricultural Research Vol. 1, No. 1, pp. 12-16. Springer-Verlag New York.
2. USDA-Agricultural Marketing Service web site. [Http://www.ams.usda.gov/mnreports/SX_FV020.txt](http://www.ams.usda.gov/mnreports/SX_FV020.txt)
3. Clark, Lee J. 1993. Chile Pepper Variety Trial in Graham County, 1993. 1993 Vegetable Report, College of Agriculture, The University of Arizona, Tucson, AZ. Series P-97, pp. 7-10.

4. Clark, Lee J. 1993. Chile Pepper Variety Trial in Greenlee County, 1993. 1993 Vegetable Report, College of Agriculture, The University of Arizona, Tucson, AZ. Series P-97, pp. 3-6.

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Table 1. Yield data for bell pepper varieties grown on the Safford Agricultural Center, 1998.

Variety	Date of First Harvest	Fruit Yield (Tons/acre)	Individual Fruit Weight (lbs)	Number of Fruit per plant
Karma	7/29	20.4 a	0.24 a	11.8 bc
Hialeah	7/29	18.4 ab	0.17 c	15.4 b
Flamingo (Yellow)	7/24	17.3 ab	0.12 d	19.7 a
Four Corners	7/29	15.6 ab	0.16 c	14.1 b
Emerald Isle	7/29	13.6 ab	0.17 c	11.5 bc
Bonita	7/29	13.6 ab*	0.20 b	9.5 cd
Primadonna	7/29	12.2 ab	0.20 b	8.4 cd
Boynton	7/29	10.0 b	0.21 b	6.7 d
Average	--	15.1	0.18	12.1
LSD(05)	--	5.6	0.02	4.0
CV(%)	--	25.0	8.9	22.5

* Values followed by the same letter, within a column, are not significantly different at the 95% level of confidence using Duncan's Multiple Range test.

Table 2. Yield data for other pepper varieties grown on the Safford Agricultural Center, 1998.

Variety	Date of First Harvest	Fruit Yield (Tons/acre)	Individual Fruit Weight (lbs)	Number of Fruit per plant
Jalapeño				
Picante	7/29	18.7 a*	0.02	128.8
Olè	7/29	16.4 a	0.03	75.3
Average	7/29	17.5	0.025	102.1
LSD(05)	--	3.9	--	--
CV(%)	--	10.0	--	--
Yellow Wax				
Copacabana	7/24	20.1 a*	0.043 a	65.1
Volcano	7/24	17.1 b	0.053 a	44.9
Average	--	18.6	0.048	55.0
LSD(05)	--	2.2	0.01	--
CV(%)	--	5.3	12.1	--
Long Green Chile				
AZ 20	8/17	10.0 a*	0.053 a	25.9
AZ 9	8/17	9.7 a	0.055 a	24.3
AZ 8	8/17	8.5 a	0.045 a	26.0
Average	--	9.4	0.051	25.4
LSD(05)	--	2.5	0.009	--
CV(%)	--	15.1	10.9	--
Serrano				
Rio Verde	8/17	9.3	.009	142.3

* Values followed by the same letter, within a column and variety, are not significantly different at the 95% level of confidence using Duncan's Multiple Range test.