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Within-row spacing affects sweet corn

Six within-row spacings of 10, 9, 8, 7, 6 and 5 inches between plants in 36-inch rows were tested on Jubilee sweet corn at the OSU Vegetable Research Farm in 1977. Plots were seeded heavily on May 20 and later thinned to the above average spacings resulting in plant populations of 17.4, 19.3, 21.8, 24.9, 29.0 and 34.8 thousand plants per acre, respectively. Fertilizer was banded at planting at a rate of 50 pounds N, 150 pounds P_2O_5, 50 pounds K_2O/A and 100 pounds N/A as ammonium nitrate was sidedressed on July 20 when plants were 26-40 inches high. Irrigation was provided as needed at 10- to 14-day intervals. Full silk stage of growth was August 5-6 and harvests were made on August 31, September 6 and 9 (103, 109 and 112 days after planting). Yields are based on harvest of single row plots, 25 feet in length replicated 5 times for each harvest. Observations on ear weights, length etc., are for 25 husked, acceptable ears from each spacing treatment at each harvest date. Immature ears and "nubbins" were classified as unacceptable.

The effects of plant spacing and harvest dates on yields and ear measurements are shown in Table 1. Yields were increased as populations were increased (within-row spacing decreased). Harvests varied, but when the three harvests are combined, increasing the plant population from 17,400 (10-inch spacing) to 34,800 (5-inch spacing) plants/A increased total unhusked yield 16 percent and yield of husked acceptable (good) ears by 18 percent. The major part of the increase was from changing the plant spacing from 6 to 5 inches. The average number of acceptable ears produced per plant was decreased as populations were increased, as would be expected. Average weight of individual husked ears was decreased by only 7 percent as population was increased

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Table 1. Effects of within-row spacing and harvest dates on Jubilee sweet corn. Corvallis, 1977.

	Plant spacing	Yield - T/A		Husked acceptable ears					
				ears/100·plants	Wt/ear	ear length	diam ear	cut-off	moisture
	inches	Total unhusked	Husked accept	no.	lbs	cm	mm	%	%
Harv.#1	10	12.5	7.6	152	.59	19.6	51	50	71
	9	13.1	8.1	148	.59	19.9	51	49	72
	8	13.4	8.2	127	.61	19.5	50	49	72
	7	13.9	8.6	122	.59	19.6	50	50	74
	6	14.1	8.6	105	.59	19.0	51	50	74
	5	16.1	9.9	102	.57	18.9	50	50	73
Harv.#2	10	12.8	8.5	146	.69	19.2	51	59	70
	9	13.8	9.4	146	.69	19.0	51	59	70
	8	14.3	9.1	122	.70	19.2	52	60	70
	7	13.2	8.9	110	.68	19.2	51	60	70
	6	13.9	9.0	101	.64	18.3	50	59	71
	5	14.6	9.7	92	.62	18.1	50	60	70
Harv.#3	10	13.8	9.1	148	.73	19.1	53	57	68
	9	13.3	8.2	133	.68	18.8	52	58	69
	8	13.1	8.9	120	.70	18.9	52	57	69
	7	14.2	9.5	115	.69	18.1	51	58	69
	6	13.0	9.0	95	.68	18.0	51	57	69
	5	14.6	10.0	88	.67	18.0	52	58	69
Spac. avg.	10	13.0	8.4	149	.67	19.3	52	55	70
	9	13.4	8.5	143	.65	19.2	51	55	70
	8	13.6	8.7	123	.67	19.2	51	55	70
	7	13.8	9.0	115	.65	19.0	51	56	71
	6	13.7	8.9	100	.63	18.4	51	55	71
	5	15.1	9.9	94	.62	18.3	51	56	71
Harv. date avg.	H1	13.8	8.5	126	.59	19.4	50	50	73
	H2	13.8	9.1	120	.67	18.8	51	60	70
	H3	13.7	9.1	117	.69	18.5	52	58	69

from the lowest to the highest level while average length of ears was reduced 5 percent. Very little difference was noted in diameter of ears or percent cut-off (based on husked ear weight) as populations were varied.

Average moisture contents of kernels were 73, 70, and 69 percent, respectively, for the three harvest dates. Yields of husked ears were higher at the second and third harvests than for the first harvest but total unhusked yields were not different. Ear weight was 17 percent higher at the third than at the first harvest and percent cut-off was higher.

These results support earlier work indicating sweet corn yields can be increased as plant populations in 36-inch rows are increased to 30-35,000 plants/A. However, at higher populations, ear weight and size are reduced and may result in economic disadvantage for certain uses or styles of processed products. These factors need to be considered, along with varieties and other cultural practices, in determining optimum spacings and populations for highest economic returns for growers and processors.

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Onion foliar desiccants evaluated

Onion top desiccants were evaluated over a period of years. In 1974, preliminary observations were made on a number of desiccants. In 1975 and 1976, foliar sprays of Ethephon, Endothall, Paraquat, Stoddard solvent and Des-i-cate were evaluated in replicated plots at two concentrations and applied at two dates (12 and 5 days) before lifting, to hasten field curing and desiccation of onion leaves. Onion top desiccant effects on neck moisture content on various sampling dates for 1975 and 1976 are shown in Figs. 1 & 2.

Table 1. Top desiccant effects on storage quality of Danvers Yellow Globe onions held at 5°C and 80% relative humidity for 5 months. (1974)

TREATMENTS		% WEIGHT LOSS	% ROT	% ROOT SPROUT	% SHOOT SPROUT
Des-i-cate	1 lb/acre	2.78	14	36	2.7
Des-i-cate	4 lb/acre	1.74	0	39	1.8
Endothall	1 lb/acre	1.87	4	47	2.6
Endothall	4 lb/acre	2.46	29	61	1.0
Paraquat	1 lb/acre	3.35	47	2	0.0
Stoddard Solvent	113 gal/acre	1.60	8	27	2.0
Ethephon	1 lb/acre	3.17	2	5	5.2
Ethephon	4 lb/acre	2.83	11	38	2.3
Control	unsprayed	1.81	1	10	0.0

Percent rotted after five months' storage are presented in Table 1 for 1974, and in Figs. 1 and 2 for 1975. Figs. 1 and 2 also show the progressive neck tissue desiccating effects of the four chemicals over a period of five sampling dates.

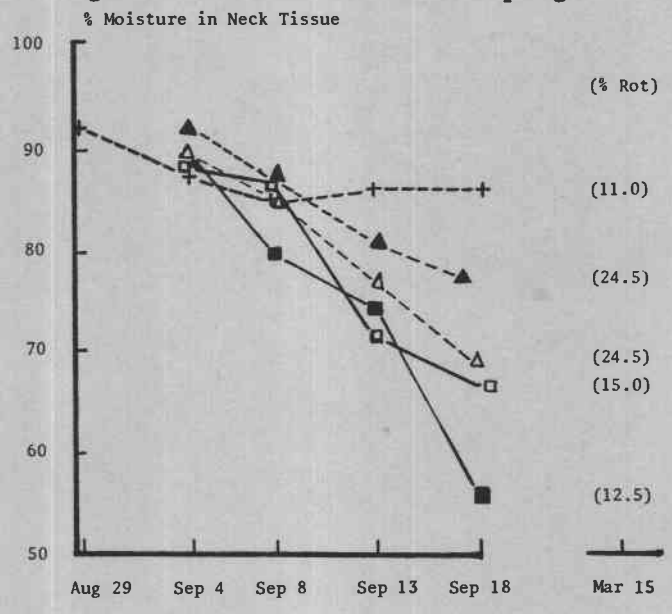

Fig. 1. Onion Neck Moisture After Top Desiccant Sprays.

+ Control
□ Ethephon 2 lb/A applied 29 Aug
■ Ethephon 4 lb/A applied 29 Aug
△ Paraquat ½ lb/A applied 29 Aug
▲ Paraquat 1 lb/A applied 29 Aug

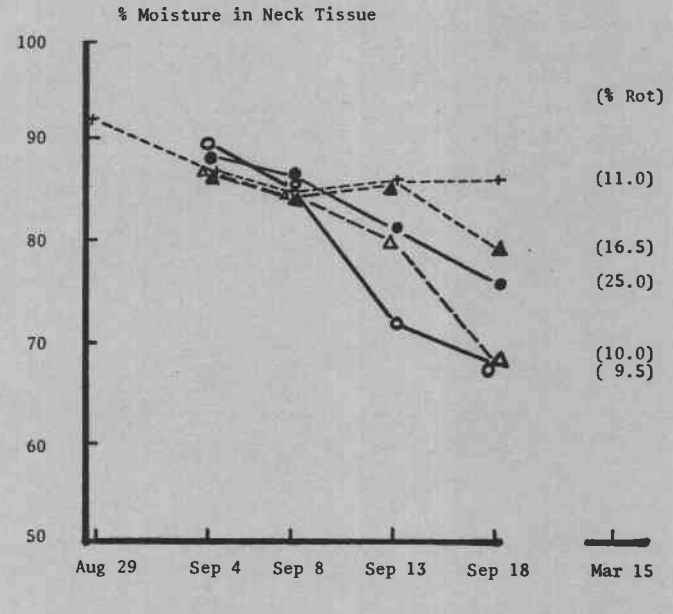

Fig. 2. Onion Neck Moisture After Top Desiccant Sprays.

+ Control
○ Endothall 1 lb/A applied 29 Aug
● Endothall 4 lb/A applied 29 Aug
△ Stoddard Solvent 50 gal/A applied 29 Aug
▲ Stoddard Solvent 100 gal/A applied 29 Aug

Onion size was affected by all of the desiccants. Table 2 shows the reduction in onions greater than three inches in diameter for each of the desiccants evaluated. The difference in size reduction may be attributed to the cessation of bulb growth which occurred after the desiccant was applied.

Table 2. Onion top desiccant trials. (1974)

TREATMENTS		DESICCATION RATING* AFTER SIX DAYS	NO. IN STAND	SIZE DISTRIBUTION % OF TOTAL			
				<2"	2-2½"	2½-3"	>3"
Des-i-cate	1 lb/acre	4	289	9	36	44	10
Des-i-cate	4 lb/acre	4	305	15	33	40	12
Endothall	1 lb/acre	4+	315	16	37	38	9
Endothall	4 lb/acre	5	283	18	30	41	11
Paraquat	1 lb/acre	5	310	13	37	45	5
Stoddard Solvent	113 gal/acre	4	292	15	25	46	13
Ethephon	1 lb/acre	3+	306	14	27	44	15
Ethephon	4 lb/acre	3	310	16	22	44	17
Control	unsprayed	2	262	14	20	38	27

*Rated subjectively 1-5, 1 being least effective.

In 1977, Ethephon and Paraquat were evaluated again. This was done to confirm earlier data regarding Ethephon. In the earlier experiments, Ethephon did not have as deleterious an effect on storage rot as some of the other compounds.

Paraquat was tested at three rates; and Ethephon at one rate. Both compounds were applied at two dates (10 and 5 days before lifting). For the 10 days before lifting treatment, both Paraquat and Ethephon applications resulted in an increase in storage rots. This difference was significantly greater than the control. No significant difference was recorded, however, between Ethephon and Paraquat. In 1977, no significant differences for any of the treatments were observed on bulb weight, bulb size or percent rooting in storage. This was probably due to high temperatures in the fall of 1977 ending onion growth prematurely for all treatments including the check. When the desiccant was applied five days before lifting, no significant differences were observed with either material. Table 3 shows the percent of rot for Paraquat and Ethephon. A rain immediately following the application of the chemicals may have accounted for the results observed at this treatment date.

Table 3. Onion Top Desiccant Trials. (1977)

TREATMENTS	MEANS	
	PERCENT NECK ROT	PERCENT TOTAL ROT
Check	0.00 a	2.00 a
1/8# Paraquat	2.67 b	3.00 a
1/4# Paraquat	4.33 b	5.67 a
1/2# Paraquat	7.33 b	12.67 b
4# Ethephon	9.30	15.80

Means sharing common letters show no significant differences at the 1% level using Duncans multiple range test.

Figs. 3 and 4 show the percent moisture of the neck tissue for the two compounds over eight different sampling dates. Both Ethephon and Paraquat reduced neck moisture. Periodic rains during the pre-lifting period indicated that previously dry tissue tended to absorb moisture from the rain to varying extents depending upon the degree of desiccation.

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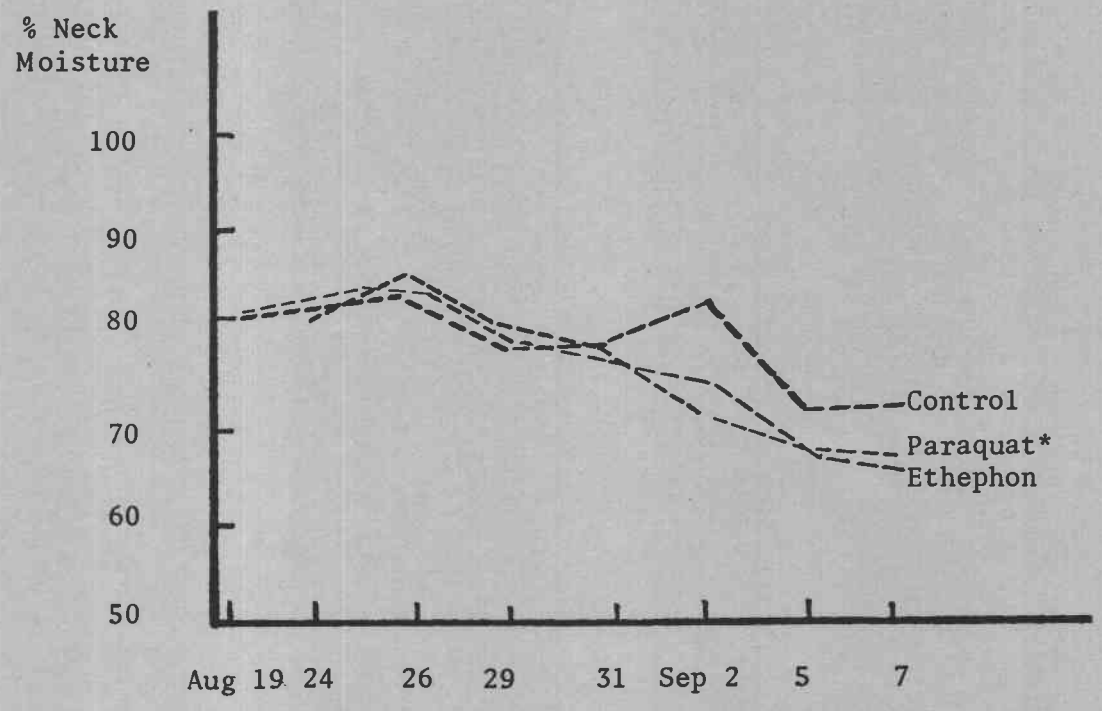

Fig. 3. Desiccants applied 10 days before lifting (Aug 19).

* $\bar{x}$ of all Paraquat rates for a given date of application.

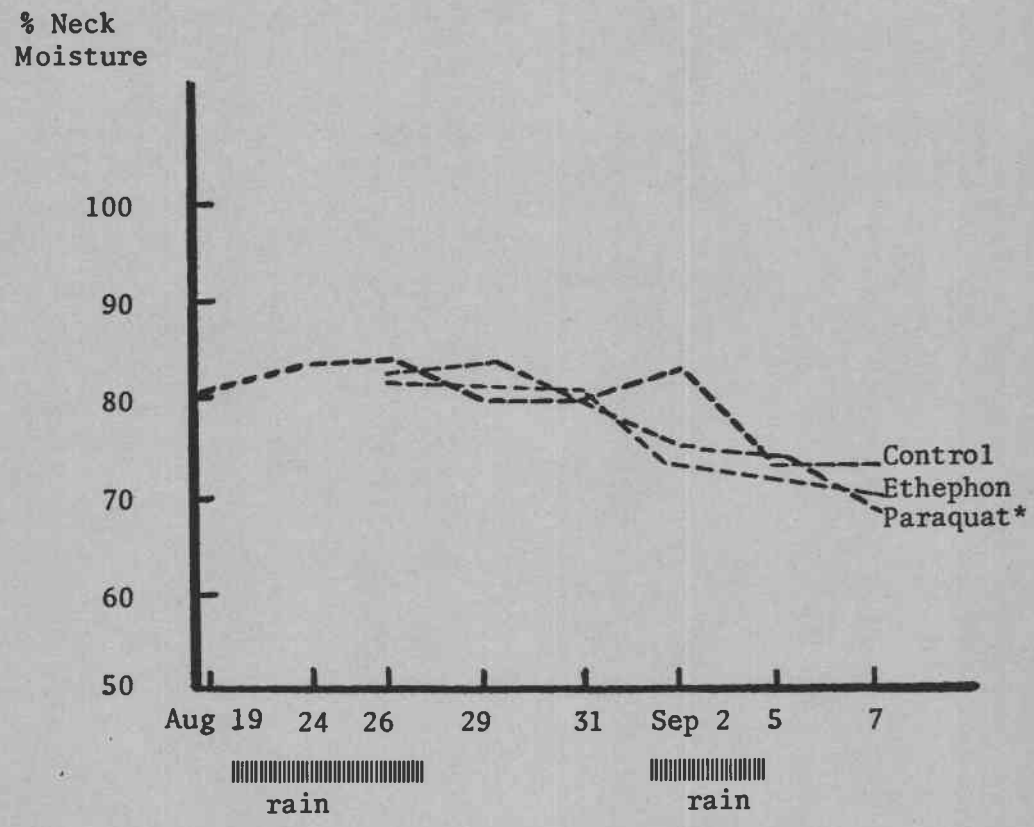

Fig. 4. Desiccants applied 5 days before lifting (Aug 24).

* $\bar{x}$ of all Paraquat rates for a given date of application.

Fresh market vegetable experiments summarized

Several experiments were conducted at the North Willamette Experiment Station in 1977 and are summarized below. More detailed information can be obtained by writing directly to the author at the North Willamette Experiment Station, Rt. 2, Box 600, Aurora, OR 97002.

Overwintering Onions, 1976-77.

The purpose of these trials was to evaluate the performance of several Japanese and American cultivars for overwintering in the Willamette Valley. Only one planting out of three, seeded on September 9, emerged and overwintered successfully. Earlier plantings apparently were harmed by pesticide treatments. Harvest occurred on June 28, 1977 before tops were down. Promising cultivars were Presto, Express Yellow, Keep Well, and Senshyu Yellow Globe. This study is being repeated in 1977-78.

Early Cauliflower Trials

Nine cultivars and experimental lines of cauliflower were seeded on January 14 in a greenhouse seedbed and transplanted to the field on February 14. In addition, three varieties were direct-seeded on February 14. Harvest of transplanted cauliflower commenced May 24. Moran M_1, the earliest line, showed great promise, with average head weight of 500g, 12-cm. diameter, excellent quality. Other promising cultivars were Moran M_2 and M_3 and Snow Crown. Harvest of direct-seeded cauliflower commenced June 15. Snowball Y and Snow Crown produced acceptable yield and quality.

Raised Bed Culture of Root Crops.

Newly shaped raised beds produced significantly higher weight of spring crop grade 1 carrots than either "flat bed" culture, overwintered raised beds, or plastic-covered, overwintered raised beds. New raised beds also produced higher weight of #1 plus #2, lower weight of #3, higher number normal roots, and lower number of bent roots than did the overwintered beds. Flat beds, newly formed, were also superior to old-raised beds in all but weight of #1's. For summer crop carrots, raised beds produced slightly higher yields of #1 carrots.

Yield and quality of parsnips was not affected greatly by raised beds, in either the spring or summer crop. Only yield of #1 plus #2 was increased by raised beds in the spring crop; there were no significant differences for the summer crop.

Early Stand Establishment on Sweet Corn and Cauliflower.

The purpose of these experiments was to investigate possible methods for establishing earlier and more complete stands and earlier maturity of crops planted during periods of suboptimal soil and air temperatures. Banded phosphorus, phosphoric acid sprays and clear plastic mulch treatments were applied to each crop as follows: 1. No phosphorus (Po), 2. Po + plastic, 3. Po + phos acid, 4. Po + Phos acid & plastic, 5. P_1 (banded P at planting) & phos acid, 6. P_1+ phos acid & plastic. Added P, particularly banded P, increased cauliflower germination as did plastic mulch. Plastic mulch tended to reduce cauliflower yield. P increased yield. Treatment had no effect on sweet corn stand, but seed under plastic emerged earlier and grew more rapidly. P had no consistent effect on sweet corn seedling growth. Yield of #1 ears was increased by plastic but not by P, reflecting advanced maturity. In contrast, P, but not plastic, increased total ear yield. Thus, the major effect of plastic on corn was to increase earliness, while banded P and phos acid increased total plant mass.

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