

# ETHREL EFFECTS ON FRUIT RIPENING OF PEPPERS

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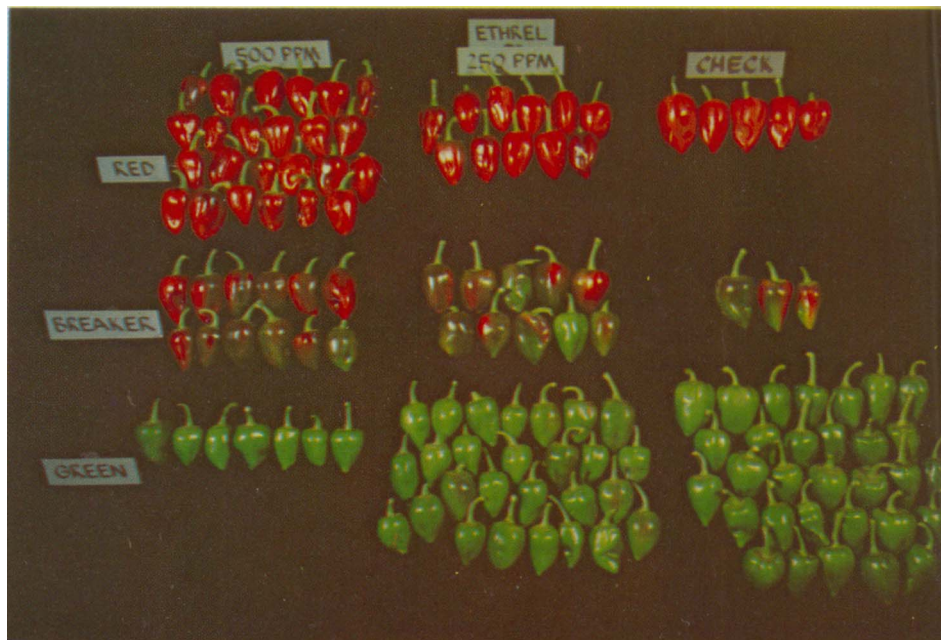


Photo 1. Relationship of red, breaker, and green Pimiento pepper fruits for check, 250 ppm, and 500 ppm Ethrel treatments (Davis plots).

**S**TUDIES WITH ETHREL (2-chloroethylphosphonic acid) on tomatoes have demonstrated the effects of this chemical on fruit ripening (see CALIFORNIA AGRICULTURE July 1969). Preliminary greenhouse studies at Davis in 1968 indicated that Ethrel would also hasten the ripening of chili peppers (variety California). Fruits turned a red ripe color eight days after a treatment at 100 ppm (photo 2). The plants were sprayed to run-off when the first fruits began to color. Concentrations of 250 and 500 ppm caused complete defoliation of the leaves and fruit abscission in five days (photos 3 and 4).

Field experiments with Ethrel on both chili (variety California) and pimiento (variety Pimiento select) peppers were conducted at Davis and with pimiento alone at Hollister, in September and October, 1969. In all field experiments the treatments included rates of 100, 250, and 500 ppm, applied at 100 gallons per acre and a pressure of 40 psi. Each treatment consisted of a 15-ft row, and there were four replications. The applications were made when the first fruits on the plants began to turn a chocolate brown or slightly red.

The pimiento pepper trial at Davis was harvested 17 days after treatment and the chili pepper trial 23 days after treatment. The pimiento pepper trial at Hollister was harvested 22 days after treatment. The

effect of Ethrel treatments on percentage of red, breaker, and green fruit in pimiento peppers is shown in tables 1 and 2 and for chili peppers in table 3.

Photo 1 illustrates the relationship of red, breaker, and green fruits from four harvested plants of each treatment. In each case the check plots gave a higher percentage of green fruit than the treated plots, and with each increase in Ethrel concentration the percentage of the green fruit decreased. Total yields were not affected by Ethrel treatments. Higher concentrations are evidently required for field experiments than for greenhouse experiments, and for cool coastal growing areas, than for warmer areas in the Central Valley.

Additional field trials, including studies of volume of spray and rates and timing of applications, are needed before the implications of this new chemical regulator will be known. Further studies are planned for the 1970 season. Ethrel is not registered or recommended for use at this time.

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Photo 2 (right). All pepper fruits had ripened to red color in eight days after application at the 100 ppm rate (plant to left) as compared with green immature fruit of the untreated check plant (to right).

Photo 3 (below). Abscission occurring at stem attachment caused by high concentrations of Ethrel.



TABLE 1. ETHREL EFFECT ON PERCENT OF INDICATED MATURITY OF PIMIENTO PEPPERS, DAVIS—1969

Treatment	Red	Breaker	Green
	Percent total weight		
Check	15.3	7.3	77.4
100 ppm	18.3	28.6	53.2
250 ppm	24.3	27.1	48.6
500 ppm	61.1	27.0	11.9

TABLE 2. ETHREL EFFECT ON PERCENT OF INDICATED MATURITY OF PIMIENTO PEPPERS, HOLLISTER—1969

Treatment	Red	Breaker	Green
	Percent total weight*		
Check	8.9	14.3	76.8
100 ppm	18.2	24.1	57.7
250 ppm	17.7	31.6	50.7
500 ppm	27.7	38.6	33.7

\* Significant differences at 5% level.

TABLE 3. ETHREL EFFECT ON PERCENT OF INDICATED MATURITY OF CHILI PEPPERS DAVIS—1969

Treatment	Red	Breaker	Green
	Percent total weight		
Check	6.7	22.0	71.3
100 ppm	4.2	27.9	68.0
250 ppm	17.0	35.3	47.7
500 ppm	48.8	14.4	36.8

# An economic analysis questions CENTRAL SORTING OF CANNERY TOMATOES

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**C**ENTRAL SORTING of cannery tomatoes has been used to some extent in most tomato growing areas of California. This article is not intended either as a criticism or as a recommendation, but rather as a brief economic appraisal of the system. The table shows the itemized

costs per ton of tomatoes for sorting operations in California. The average of \$12.28 per ton is in line with custom harvesting costs as well as costs for many growers with yields averaging 17.6 tons per acre.

The advantages of central sorting are that it requires fewer workers and they work under better conditions than if they were hand-sorting in the field—suggesting that it would be easier to get adequate

ECONOMICS OF CENTRAL SORTING OF TOMATOES—1968  
Five Operations (3 in Fresno County, 1 in Yolo County, 1 in Ventura County)

	Number 1	Number 2	Number 3	Number 4	Number 5	Average
1. Amount handled per hour at central sorter (tons)	32.0	23.0	12.0	28.0	35.0	26.0
2. Yield per acre (tons)	18.77	14.0	9.5	20.0	25.7	17.6
3. Number of machine harvesters used	6	2	5	3	5	4.0
4. Cash costs per ton and number of workers in field						
Labor						
Number of sorters	22	10	15	6	25	15.6
Number of other workers	NA	14	NA	10	22	15.3
Wages paid per ton	\$ 3.69	\$ 2.69	\$ 3.57	\$ .93	\$ 3.52	\$ 2.88
Other costs per ton*	\$ 2.65	\$ .99	\$ 2.66	\$ .99	\$ 2.83	\$ 2.02
TOTAL cash costs per ton, field	\$ 6.34	\$ 3.68	\$ 6.23	\$ 1.92	\$ 6.35	\$ 4.90
5. Cash costs and number of workers at central sorter						
Labor						
Number of sorters (average number)	NA	18	25	30	30	25.75
Number of other workers, full or part time	NA	13	NA	9	16	12.67
Wages paid per ton	\$ 2.28	\$ 3.20	\$ 4.76	\$ 2.42	\$ 3.18	\$ 3.17
Other costs per ton*	\$ .69	\$ 1.10	\$ 1.20	\$ .43	\$ 1.22	\$ .93
TOTAL cash costs per ton, central sorter	\$ 2.97	\$ 4.30	\$ 5.96	\$ 2.85	\$ 4.40	\$ 4.10
6. Total all cash costs per ton, including field and central sorter	\$ 9.31	\$ 7.98	\$ 12.19	\$ 4.77	\$ 10.75	\$ 9.00
Labor cost per ton	\$ 5.97	\$ 5.89	\$ 8.33	\$ 3.35	\$ 6.70	\$ 6.05
Percent labor cost of total cash cost	64%	74%	68%	70%	62%	68%
Other costs per ton*	\$ 3.34	\$ 2.09	\$ 3.86	\$ 1.42	\$ 4.05	\$ 2.95
Percent cash cost of total cost	76%	70%	73%	54%	87%	72%
7. Overhead cost per ton						
Central sorter	\$ .96	\$ 1.59	\$ 2.26	\$ 1.16	\$ 1.62	\$ 1.52
Field	\$ 1.97	\$ 1.79	\$ 2.53	\$ 2.85	—	\$ 2.29
TOTAL	\$ 2.93	\$ 3.38	\$ 4.46	\$ 4.01	\$ 1.62	\$ 3.28
Percent overhead cost of total cost	24%	30%	27%	46%	13%	28%
8. Total costs per ton (cash and overhead)	\$ 12.24	\$ 11.36	\$ 16.65	\$ 8.78	\$ 12.37	\$ 12.28
9. Investment per acre in central sorter equipment	\$165.00	\$90.00	\$128.00	\$166.00	\$178.00	\$145.00
10. Investment per acre in field equipment	\$222.00	\$95.00	\$270.00	\$210.00	—	\$199.00

\* Includes repairs, fuel for harvesters and transport equipment, electric power, equipment rentals and interest on operating capital.

NA = no data available.



Photo 4 (below). Defoliation of leaves occurring at the 250 and 500 ppm rate of Ethrel applications.

