Maturity was determined by sampling 300 g of water per acre at the proper time of treatment. The material was applied by spraying with water to eliminate blanks. The treatments were paired and alternated from one row to the other, with an intervening buffer row to protect against drift. Ten feet of row from each plot was harvested at three-day intervals, commencing seven days after treatment and ending 22 days after treatment. The second experiment consisted of paired plots 30 feet long harvested 14 days after treatment.

All plots were hand-harvested. Fruit were picked, sorted into six categories, weighed and counted. The categories were red, red breakers (greater than 50% of the fruit area red), green breakers (less than 50% red), mature green, undersize (less than 2% inches in diameter), and culls. The great majority of the culls were due to sunburn spots.

Results
Analysis of variance for red fruit in the multiple harvest date test showed highly significant values for treatments and harvest dates. Similar results were obtained for the other fruit categories. Data from the final harvest date (22 days after treatment) are presented in Table 1. Treatment with ethephon significantly increased the percentage of red fruit and red breaker fruit while significantly reducing the percentage of green breaker and mature green fruit. There were no significant differences in the amount of culls or undersized fruit, substantiating visual observations that ethephon did not have any detrimental effects.

The total yields for each harvest date are given in Table 2. The mean yield of the ethephon-treated material was lower than the mean of the check. Such a reduction in total yield is not unexpected because ethephon-treated fruit ripens faster than untreated fruit, reaching the red-ripe stage at a slightly smaller fruit size. However, as shown in Table 3, on the basis of one over harvest, the pronounced shift from the mixed (breakers) and mature green categories to the red category more than offsets the overall yield reduction.

Results of the test in which ethephon was applied to a relatively mature field (40% maturity) are given in Table 4. The ethephon treatment significantly reduced the percent of green fruit at harvest. There were no other differences due to ethephon treatment. The results obtained from these trials indicate that fields should be treated early to obtain maximum ripening. Treatment at 10% maturity produced a significant increase in ripening. Treatment at 40% color was too late to obtain a useful increase in the ripening rate. These results point out the need for more research to refine the treatment-harvest interval.


table 1. effect of ethephon on the indicated maturity of bell peppers 22 days after treatment (application at 10% maturity)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>% of Total Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Red</td>
</tr>
<tr>
<td>Check</td>
<td>20.4</td>
</tr>
<tr>
<td>7.5 lbs/A</td>
<td>44.9</td>
</tr>
<tr>
<td>ETHEPHON</td>
<td>4.8</td>
</tr>
</tbody>
</table>

The effects of ethephon on pepper ripening have been studied for several years in both greenhouse and field experiments. Earlier reports (see California Agriculture February 1970 and June 1974) have indicated that ethephon increases ripening of fruit depending on rate of application, concentration of fruit maturity, plant condition, and air temperatures during the fruit-ripening period. Significant difference in ripening was not obtained in all trials of a 1973 statewide testing program.

In 1974, a field trial was conducted in Stanislaus County to obtain further information on treatment-harvest interval, proper time of application, and effects on fruit quality.

Procedure
Two experiments were conducted, each consisting of two plots (check and ethephon) with eight replications. In the first experiment plots were 60 feet long; the ethephon was applied when 10% of the fruit were in the red or red breaker stage (10% maturity). Maturity was determined by sampling 50 feet of row adjacent to the plots at the time of treatment. The material was applied with a backpack sprayer in 50 gallons of water per acre at 30 psi in a 20-inch band over the row. Treatments in the second experiment were delayed until 40% maturity. Checks were sprayed with water to eliminate blanks. The treatments were paired and alternated from one row to the other, with an intervening buffer row to protect against drift. Ten feet of row from each plot was harvested at three-day intervals, commencing seven days after treatment and ending 22 days after treatment. The second experiment consisted of paired plots 30 feet long harvested 14 days after treatment.

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