

A Study on the Effect of Ethrel on Uniformity of Peach Ripening

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ABSTRACT

Twelve, four year-old 'Coronado' peach trees were sprayed with 0, 100, 250, and 500 ppm ethrel, one month before harvest. Ethrel at all concentrations, had significantly increased the uniformity of fruits ripening, and produced softer fruits. Treatment with Ethrel had no effect on % dry weight, % total soluble solids, fruit length, fruit diameter, and length/diameter. Serious defoliation, fruit abscission, and gum exudation were observed.

INTRODUCTION

Peaches are successfully grown in Tripoli (Jamahiriya). However, one of the problems that peach growers are facing is the lack of uniformity in fruits ripening which adds to the costs of picking as a result of multi harvests.

Effects of ethrel on peaches were investigated by many workers. Byers (3) found that the application of ethrel prior to the completion of pit hardening enhanced final fruit swell and hastened fruit ripening. Similar results were reported by other investigators (6,11).

Treatment with ethrel had also improved the uniformity of ripening of several peach varieties (7,9,11).

The objective of this experiment was to study the effect of ethrel on the uniformity of peach fruit ripening.

MATERIALS AND METHODS

Twelve, four year-old 'Coronado' peach trees (*prunus persica* L.) were treated at random with 0, 100, 250, and 500 ppm ethrel in a completely randomized design with three replicates per treatment. Ethrel was sprayed on June 7, 1976 (approximately one month before harvest). Harvesting was on July 12, 1976, when great portion of the fruits were visually ripe, and well coloured. Data were collected as following:

The percentages of ripe fruits and dropped fruits were determined on the basis of total crop. The percentage of dry weight was determined on the flesh of three random fruits from each replicate (nine fruits from each treatment) using standard methods (1). The total soluble solids (TSS), and the firmness of fruits were determined on 30 fruits (ten from each replicate), using hand refractometer, and Magnus Taylor pressure tester

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Table 1 Effects of preharvest ethrel sprays on the fruits of 'Coronado' peach.

Ethrel (ppm)	% Ripe fruits	% Fruit drop	% Dry weight	% TSS	Firmness (kg/cm ²)	Fruit length (cm)	Fruit diameter (cm)	Length/diameter
0	39.64 a	8.28 a	12.59	9.08	20.80 a	3.96	3.38	1.17
100	85.64 b	38.39 b	12.51	9.83	12.05 b	3.97	3.26	1.22
250	88.84 b	33.60 b	12.86	9.41	10.41 b	3.85	3.34	1.15
500	91.67 b	40.77 b	12.55	9.24	11.96 b	3.86	3.38	1.15
LSD 0.05	30.58	24.19	N.S.	N.S.	5.06	N.S.	N.S.	N.S.

Means in a column followed by the same letter are not significantly different at 0.05 level of LSD.

(plunger size 0.79 cm), respectively. For fruit dimensions (length, diameter, and length/diameter) a twenty random ripe fruits from each replicate were used. All data were subjected to statistical analysis.

RESULTS AND DISCUSSION

The most important effect of ethrel on 'Coronado' peach was on fruit ripening, which resulted in a marked softening of fruits (Table 1). The percentage of ripe fruits at harvest was 39.64% for the untreated, compared to 85–91% for treated trees. No significant differences were found among treated plants in respect to both ripening and firmness of fruits. Similar result were reported by others (3,6,7,9,11). However, ethrel treated trees showed some gum exudation on the fruits, stem, main branches, and shoots (Fig. 1). The exudation of gum as a side effect for ethrel was also reported by Scott (10) and Buchanan (2). The extent of gum exudation was similar in all treatments. Another drawback in the use of ethrel, was its effect on fruit drop and leaf abscission. The percentages of fruit drop of ethrel treated trees were higher than of the control. No significant differences were found among concentrations used (Table 1). The amount of leaf abscission was proportionally increased with ethrel, as being visually noticed. No attempt was made to evaluate the exact amount of leaf abscission. However, ethrel's influence on fruit and leaf abscission could be overcome by chemicals of counter activity such as Alar and NAA (4,8).

The percentages of dry weight and total soluble solids were not affected by ethrel (Table 1). The results are in agreement with those reported by Gerin (5). However, Scott (10) reported a decrease in the percentage of soluble solids of peach fruits treated with ethrel.

Our results showed that ethrel had little or no effect on fruit length, fruit diameter, and length/diameter. This was in line with the results of Strydom (12). However, Ninkovski (9) reported a decrease and Scott (10) an increase in fruit diameter and fruit length. This conflict of reports might be due to the use of different cultivars and different time of application.

From the results obtained from this study we feel that ethrel could improve the uniformity of peach fruit ripening. Lower concentrations and different times of application should be tried to minimize the undesirable side effects of the chemical.



Fig. 1. Gum exudation on fruits, stem, main branches, and shoots of 'Coronado' peach.

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دراسة تأثير مادة الاثريل على انتظام نضج ثمار الخوخ

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مستخلص

تم رش اثني عشر شجرة خوخ صنف « كورونادو » بمادة الاثريل قبل شهر من نضج الثمار وبتركيزات صفر ، ١٠٠ ، ٢٥٠ ، ٥٠٠ جزء في المليون . وجد بصفة مؤكدة ان مادة الاثريل قد أدت الى زيادة انتظام نضج ثمار الخوخ ، الا أن هذه المادة قد أدت الى زيادة ليونة الثمار . ولم تؤثر مادة الاثريل على النسبة المئوية للوزن الجاف والنسبة المئوية للمواد الصلبة الذائبة الكلية وطول الثمرة أو قطرها أو النسبة بين الطول والقطر . هذا وقد كانت هناك تأثيرات ضارة لهذه المادة تمثلت في تساقط الثمار والأوراق وافراز المواد الصمغية .