

Ethephon has mixed effects on table grapes

Fred Jensen ■ Harry Andris

The growth regulator ethephon (Ethrel) has been shown to improve coloring of the table grape varieties, Red Malaga, Queen, Tokay, and Emperor if applied after some of the berries have begun to show color. Preliminary trials with Cardinals showed slight color benefits, of dubious commercial significance. Trials with Ribier have never shown benefit. More detailed trials were established at the Kearney Horticultural Field Station near Parlier in Fresno County during the 1976 season.

Both varieties at the Kearney Field Station are clones free of known viruses and noted to color well. In commercial vineyards, these varieties color with more difficulty.

Cardinal

In one Cardinal trial vines were not girdled, in the second they were girdled. Both responded with increased color development on the vines treated with ethephon.

Cardinal trial 1 was sprayed with ethephon on July 7, when 15 percent of the berries showed color, and harvested on July 23. Trial 2 was girdled and sprayed on July 6, when 25 percent of the berries showed color, and harvested on July 27.

In trial 1, rates of 1/2 and 1 pint of ethephon applied per acre were compared to no treatment. All the fruit could have been harvested with either rate of ethephon; 65 percent was harvestable without ethephon. In trial 2 where vines were girdled, ethephon applications made no difference in the amount of harvestable fruit. All the fruit was above the minimum color standard; however, the ethephon-treated fruit was much darker, actually overcolored to a purple hue on

some clusters.

The soluble solids and acidity were not affected by ethephon in the first, non-girdled trial. In the second trial, where all vines were girdled, ethephon produced higher soluble solids and lower total acidity. Berries tended to be slightly less firm with ethephon treatment, but not significantly so.

Ribier

The Ribier vines were girdled and sprayed with ethephon on July 26 when 10 percent of the berries showed color. The fruit was harvested on August 26 when virtually all of the crop could be harvested on the basis of color, and when the fruit met minimum maturity standards.

Ethephon produced neither beneficial nor detrimental effects in any category measured, a result consistent with previous trials. Table 1 summarizes the results of this set of trials.

In another set of trials with Cardinal and Ribier, individual clusters were tested to determine their coloring response with and without ethephon, and with and without light. Light is involved in the coloring of most if not all table grape varieties, but to differing degrees. A variety like Tokay has a high light requirement and develops virtually no color in darkness. Cardinal and Ribier have a lower light requirement and develop some color in darkness.

Half of the clusters in the trial were protected from any light exposure by means of aluminum-coated paper bags which were vented to prevent development of mold. The vented areas of the bags were baffled to prevent light entrance, while still providing ventilation.

Temperatures of bagged and unbagged clusters were the same.

The summary of results in table 2 shows a similar pattern to that of the previous trials: Cardinal responds to ethephon with increased color development, Ribier does not. Cardinal responds to ethephon whether or not light is present. The bagged clusters that were ethephon-treated developed color nearly equal to normally exposed fruit. Bagged fruit that was not treated with ethephon developed some color, but not nearly enough to be harvested. Ethephon substituted for light exposure.

Growers of Cardinal usually do increase the exposure of fruit to light by rearranging canes on the north side of the rows and removing leaves around the fruit. The trials indicate that this practice may not be necessary if Cardinals are treated with ethephon. In the vineyard, light is never totally excluded even under the most dense leaf canopy, so that conditions are normally not as rigorous as in the trial where the clusters received no light. The principal benefit of leaving the canopy intact, aside from economy, is to reduce bird damage. Vines could be opened to aid pickers just before harvest.

The Ribier in bagged clusters developed only a low level of color. Ethephon treatment made little if any difference in color development.

This is a report of trials in progress. Ethephon is not currently registered for use on grapes.

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TABLE 1. Effect of Ethephon on Cardinal and Ribier Grapes

Variety	Ethephon pints/acre	Harvestable	Soluble	Total	Berry
		fruit* percent	solids* °Brix	acidity* percent	firmness* grams†
Cardinal (ungirdled)	0	64a	15.9a	.63a	209a
	1/2	100b	16.4a	.60a	201a
	1	100b	16.6a	.60a	191a
Cardinal (girdled)	0	94a	15.9a	.67a	193a
	1	98a	17.4b	.62b	175a
Ribier (girdled)	0	100a	15.6a	.75a	183a
	1	100a	15.9a	.75a	188a

*Mean separation in each column, for each trial, by Duncan's multiple range test. Those means sharing a common letter are not significantly different.

†Grams force required to penetrate flesh.

TABLE 2. Influence of Light Exposure and Ethephon Treatment on Color Development of Cardinal and Ribier

Variety	Treatment		Fruit color
	Light exposure	Ethephon	
Cardinal	Normal	Yes	Good, sometimes too dark
	Normal	No	Good
	Bagged	Yes	Good
	Bagged	No	Poor, not harvestable
Ribier	Normal	Yes	Good
	Normal	No	Good
	Bagged	Yes	Poor to fair
	Bagged	No	Poor to fair