

HARRY L. ANDRIS

Effect of Time of Fruit Exposure on Tokay Color Development

Fred Jensen, Extension Viticulturist, Parlier
Jim Kissler, Farm Advisor, San Joaquin County
Harry Andris, Staff Research Associate, Parlier

Summary

Removing leaves on Tokay vines to improve light exposure resulted in increased color as shown by first harvest yields.

The first two dates of exposure differed from the unexposed check and from one another. The earliest date of exposure, 21 days before harvest, gave the highest yields.

Trials with bagged clusters, to exclude light, showed that Tokays develop virtually no color in the absence of light. Ethephon produces very little color response on bagged clusters.

In 1975, a trial with Tokays involving the factors of ethephon and fruit exposure, showed a beneficial effect of both in increasing yield of fruit meeting minimum color standards. The results were not entirely consistent however.

During the 1976 season, a trial was established to determine the effect of time of exposure. Ethephon was not included on this portion of the trial because this material was not registered.

Another small trial was established to determine the effects of light and ethephon on fruit color

Methods

1. Effect of time on fruit exposure.

The trial design was a complete randomized block using ten replications per treatment; single vines serving as replicates. The trial was located in the Jerry Fry vineyard near Lodi. The vines are head pruned and planted 10' x 10'. First color was noted in late July. Ten percent of the berries showed color on Aug. 6. The first exposures were made on Aug. 13 when 20 percent of the berries showed color. Subsequent exposures were made at weekly intervals on Aug. 20 and 27.

The fruit was exposed by opening a foot-wide window on the northeast vine periphery, and then removing leaves below and around the clusters to the extent possible without allowing any direct rays of the sun to hit the fruit.

The fruit was harvested only once because of the fall rains. The fruit was picked to U.S. No. 1 color standards.

2. Effect of ethephon and light exposure.

Ten vines were sprayed with ethephon at a rate of 1 1/2 pints per acre in a dilute spray on Aug. 6 when 10 percent of the fruit showed color. Ten other vines were selected for the trial but not sprayed. In each vine, one cluster was tagged and one tagged and enclosed in an aluminum foil coated paper bag to exclude light. The bag was vented to provide ventilation. Baffles allowed air movement without permitting light to enter. Clusters chosen for bagging either had no colored berries or the few berries showing color were removed. For the exposed fruit, leaves were removed on Aug. 13 when 20% of the berries showed color. Observations of color were made on Sept. 2 and Sept. 14.

Results

1. Effect of time on fruit exposure.

The results in Table 1 showed that the longest exposure, 21 days, was more effective than 14 days. Seven days of exposure was not significantly different from the unexposed check.

2. Effect of ethephon and light exposure.

The results of these observations are shown in Table 2 along with similar trials with other varieties for comparison.

Tokay is the most light sensitive of all the varieties. The variety responds favorably to ethephon when the clusters are exposed to light. When bagged, slightly better color did develop with ethephon but the response was barely noticeable.

Discussion

The development of color in Tokay is highly dependent upon light exposure. However, removing leaves to provide better exposure increases the possibility of heat damage. Thus, the goal is to remove leaves at a time to enhance color development the most with the least possibility of increasing burn. The trials the last two years are not conclusive but indicate that guides to timing of exposure may be suggested as follows:

1. About one week after ethephon is applied (apply ethephon at 5% color break).
2. When about 20% of the berries show color.
3. Two to three weeks before the contemplated harvest.
4. When fruit tests 12-13 °Brix.

So far as amount of exposure is concerned, the greater the exposure the better so long as no burn or buckskinning results. Good exposure is difficult to accomplish with the head pruned Tokay vines. It can be done but only with considerable expense. Leaves must be removed around virtually every cluster. Due to the type of training and pruning, workers must crawl underneath and all around each vine to expose the clusters. To give good exposure but to prevent burn, the leaves to remove must be chosen with care.

Table 1. Effect of date of fruit exposure on first harvest yields of Tokay. Jerry Fry vineyard, Lodi.

Date fruit exposed	Interval between exposure & harvest days	Sept. 2 yield per vine pounds
1. Not exposed	-	8.3 a
2. Aug. 27	7	10.7 a
3. Aug. 20	14	14.8 b
4. Aug. 13	21	19.2 c

Table 2. Influence of light exposure and ethephon treatment on color development of Cardinal, Red Malaga, Ribier, Tokay and two Emperor clones.

Variety	Treatment		Fruit color
	Light exposure	Ethephon ^{2/}	
1. Cardinal (registered clone)	1. Exposed	Yes	Good, sometimes too dark
	2. Exposed	No	Good
	3. Bagged	Yes	Good
	4. Bagged	No	Poor
			Nearly equal
2. Red Malaga (field-run clone)	1. Exposed	Yes	Good
	2. Exposed	No	Fair
	3. Bagged $\frac{1}{1}$	Yes	Poor
	4. Bagged $\frac{1}{1}$	No	Very poor
3. Ribier (registered clone)	1. Exposed	Yes	Good
	2. Exposed	No	Good
	3. Bagged	Yes	Poor to fair
	4. Bagged	No	Poor to fair
			Equal
			Equal
4. Tokay (field-run clone)	1. Exposed	Yes	Good
	2. Exposed	No	Fair to good
	3. Bagged	Yes	Very poor
	4. Bagged	No	None to tinges of pink
5. Emperor (field-run clone)	1. Exposed	Yes	Good
	2. Exposed	No	Fair
	3. Bagged	Yes	Poor, orange hue
	4. Bagged	No	Very poor, orange hue
6. Emperor (registered clone)	1. Exposed	Yes	Good, sometimes too dark
	2. Exposed	No	Good
	3. Bagged	Yes	Fair but orange hue
	4. Bagged	No	Poor, orange hue

^{1/} Bagged Red Malaga clusters did not mature normally.

^{2/} Rate of 1 pint per acre except for 1 1/2 pints per acre in Tokay.