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TABLE GRAPE HANDLING PRACTICES

CARDINAL AND RIBIER

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These trials are a continuation of experiments started in 1972 to determine the most efficient method of producing Cardinals and Ribiers. These varieties are similar in their behavior and cultural requirements and are among those with the highest labor inputs.

In 1972, we learned from our observations and test results that the vines must be crown-suckered to two shoots per spur, that the sideshoots must be removed in the cluster zone prior to bloom, and that it is desirable to do most or all of the thinning required by thinning the flower clusters prior to bloom.

Our 1973 trials were designed to test the effect of three pre-bloom shoot treatments:

1. No leaves removed.
2. Two basal leaves removed.
3. All basal leaves removed (up to and including the leaf opposite the last retained cluster).

The time required for the operations was kept and tabulated. These times are undoubtedly not indicative of requirements under commercial conditions but should only be regarded as comparative between treatments.

Cardinals - Kearney Horticultural Field Station

These six-year-old, third-crop vines are in K. E. Nelson's trellis trial. The cordon is at the 4-foot level with slanting crossarms of 4 or 5-foot widths,

2 feet above the cordon. The foliage is widely spread with the fruit fairly well exposed to light without leaf removal.

Two clusters were retained per shoot with shoulders or tendrils removed. The second and third clusters were kept if the shoot had three clusters.

The design was a randomized complete block. There were 16 replications of each treatment with single vines serving as replications.

At harvest on July 16, all the fruit was picked and separated into packable or non-packable categories. The non-packable were those clusters excessively straggly or with excessive shot berries.

The harvest results in Table 1 show no differences between treatments 1 and 2. Treatment 3, all basal leaves removed, showed reduced packable and total yield, higher non-packable yield, smaller berry size and higher soluble solids. The pre-bloom leaf removal resulted in a poor set of normal berries and increased shot berries. The lowered total yield probably explains the slight increase in soluble solids.

Table 2 shows the time required for the operations performed. The only differences were in fruit exposure time on July 5, when treatment 3 required less time than treatments 1 or 2, and this also resulted in a lower total time. The time saving, roughly 10 hours per acre, produced a severe penalty of some 4 tons per acre of packable fruit.

Ribiers - Giumarra - Kern County

This commercial block, about 15 years old, is in an early maturity district. One cluster, the second, was retained per shoot. The design was a randomized complete block, 13 replications of each treatment, with single vines as replications.

The harvest results in Table 3, show no differences between treatments 1 and 2, but treatment 3 reduced the packable yield and the total yield, and

increased the non-packable yield. The berry weight and the total acidity were reduced, while the soluble solids were increased.

The reduced yields were due to a poorer set of normal berries resulting in straggly clusters and slightly increased amounts of shot berries.

Flower-cluster counts were made on April 16, 1974, to determine if the shoot treatments had any effects on fruitfullness. These counts showed no significant differences.

Ribiers - Kearney Horticultural Field Station

These vines are in the mother block and trained fairly low. The cordon is at a 3-foot height with a 3 1/2 foot slanting crossarm, 14 inches above the cordon.

Treatments were completely randomized with 10 replications of each treatment, single vines serving as replications.

Two clusters were retained per shoot, the second and third being preferred where available. The shoulders or tendrils were removed pre-bloom.

The harvest results are shown in Table 4. Treatment 1 and 2 gave similar results except for soluble solids. Treatment 3 reduced yield of packable fruit and total yield, and increased the yield of non-packable fruit. The berry weight was reduced. The poorer yield was due to a poor set resulting in straggly clusters and increased numbers of shot berries.

The times required for the various operations are shown in Table 5. There were no differences until August 22 when the leaves were removed from the cluster area. All treatments were different from one another. This leaf removal treatment also resulted in the total for all operations being significantly different from one another.

Summary

Two Ribier trials and one Cardinal trial showed that pre-bloom removal of all basal leaves reduced packable yield and total yield, and increased

non-packable yield. The leaf removal resulted in a poor set of normal seeded berries and increased numbers of shot berries. It also reduced the berry weight and in two of three cases, increased the soluble solids. This soluble solid increase was probably the result of the reduced total yield.

Time required for the total operation did not vary except for the post-bloom leaf removal in the cluster area to expose the fruit. In the Cardinals, removing all basal leaves pre-bloom greatly reduced the time requirement for leaf removal post-bloom. In the Ribiers, removing two basal leaves pre-bloom reduced the time requirement as compared to no pre-bloom leaf removal, and removing all basal leaves pre-bloom, reduced the time requirement as compared to either no leaves removed or two basal leaves removed.

The trials show that removing all basal leaves is definitely detrimental. Removing two basal leaves apparently does no harm although both Ribier trials showed a trend toward lower packable yield. The Kearney trial barely escaping significance.

Removing the two basal leaves pre-bloom saved time in the post-bloom cluster exposure operation in the Ribier trial but not in the Cardinals. Thus, there is no clear cut evidence for or against retaining or not retaining the two basal leaves in these trials.

Table 1

Cardinals - KHFS
Effect of Shoot Treatment on Harvest Weights, Berry Weight and Fruit Maturity

Harvested July 16, 1973

Shoot Treatment	Pounds per Vine (tons per acre) Packable	Non-Packable	Total	Berry Weight grams	Soluble Solids °Brix
1. No leaves removed	43.1 a (9.3)	3.64 a (.78)	46.7 a (10.0)	7.74 a	14.5 a
2. Two basal leaves removed	43.5 a (9.4)	1.98 a (.43)	45.5 a (9.8)	7.96 a	14.6 a
3. All basal leaves removed	24.2 b (5.2)	8.32 b (1.8)	32.6 b (7.0)	7.18 b	15.0 b

Table 2

Cardinal Shoot Treatment Trial
Time Required to Perform Operations Reported in Seconds Per Vine and in Parenthesis, Converted to Hours per Acre

Shoot Treatment	Crown Sucker April 25	Remove Sideshoots Flower-Cluster Thin & Impose Treatments May 9-15	Fruit Exposure by Removing Leaves July 5	Total All Operation
1. No leaves removed	54.4 a (6.50)	310.6 a (37.1)	151.8 a (18.1)	516.8 a (61.7)
2. Two basal leaves removed	52.9 a (6.32)	356.2 a (42.5)	140.3 a (16.8)	549.5 a (65.6)
3. All basal leaves removed	57.1 a (6.82)	332.2 a (39.7)	51.1 b (6.10)	440.5 b (52.6)

Table 3

Ribiers - Kern Co.
Effect of Shoot Treatment on Harvest Weights, Berry Weight, and Fruit Maturity

Harvested July 26, 1973

Shoot Treatment	Pounds per Vine (tons per acre) Packable	Non-Packable	Total	Berry Weight grams	Soluble Solids °Brix	Total Acid, gms Tartaric per 100 ml Juice
1. No leaves removed	34.6 a (7.4)	2.1 a (.45)	36.7 a (7.9)	7.72 a	16.2 a	.78 a
2. Two basal leaves removed	33.5 a (7.2)	2.1 a (.45)	35.6 a (7.7)	7.77 a	16.4 a	.77 a
3. All basal leaves removed	24.9 b (5.4)	3.7 b (.80)	28.6 b (6.1)	6.98 b	17.2 b	.69 b

Table 4
Ribiers - KHFS
Effect of Shoot Treatment on Harvest Weights, Berry Weight, and Fruit Maturity

Harvested Aug. 27, 1973

Shoot Treatment	Pounds per Vine (tons per acre) Packable	Non-Packable	Total	Berry Weight grams	Soluble Solids °Brix
1. No leaves removed	43.7 a (9.4)	4.0 a (.86)	47.7 a (10.3)	6.56 a	16.0 a
2. Two basal leaves removed	39.3 a (8.4)	3.8 a (.82)	43.2 a (9.3)	6.63 a	14.6 b
3. All basal leaves removed	26.0 b (5.6)	5.8 a (1.2)	31.8 b (6.8)	5.91 b	15.9 a

Table 5

Kearney Ribiers - Shoot Treatment Trial
Time Required to Perform Operations Reported in Seconds per Vine and in Parenthesis, Converted to Hours per Acre

Shoot Treatment	Crown Sucker May 1	Remove Sideshoots, Flower-Cluster Thin & Impose Treatments May 21	Fruit Exposure Aug. 22		Total All Operations
			Cut Canes	Remove Leaves	
1. No leaves removed	79.5 a (9.49)	370.1 a (44.2)	30 (3.58)	139.5 a (16.7)	619.1 a (73.9)
2. Two basal leaves removed	66.9 a (7.99)	346.1 a (41.3)	30 (3.58)	98.5 b (11.8)	541.5 b (64.7)
3. All basal leaves removed	77.0 a (9.19)	329.7 a (39.3)	30 (3.58)	54.7 c (6.53)	491.4 c (58.7)