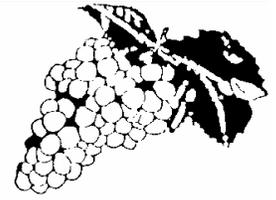




Grape Notes



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Red Globe Pruning, Bud Fruitfulness and Crop Load Study

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A mature and productive Red Globe vineyard near Earlimart in Tulare County was used for a pruning and crop load study in 2006. Vines were trained as bilateral cordons and the vineyard had a 'T' trellis with a seven foot stake and three foot crossarm.

Pruning varied by number of buds retained per spur: one-, two-, three- or four-bud spurs. All experimental vines were pruned averaging sixteen spurs; only spur length varied between pruning treatments. Vines were not shoot thinned and no clusters were removed, tipped, or lateral thinned so that the effects of spur length on crop production could be measured along with bud break and bud fruitfulness. Vines were harvest on September 20th.

Bud break and fruitfulness: Bud break decreased with increasing spur length. One- and two-bud spurs resulted in nearly 100% bud break. The lower buds of the three- and four-bud spurs broke poorly reducing the overall bud break for the spur to 71% and 61%, respectively. Pruning to one-bud resulted in shoots developing from latent buds at the spur's base, averaging 2.4 latent shoots per spur, Photos 1. There were almost no latent shoots with 4-bud spurs, Table 1. Bud fruitfulness increased with the distal position of the bud. The first and second bud averaged about 1 cluster per bud. The third and fourth buds average 1.3 and 1.6 clusters per bud, respectively, Table 2.

Dormant buds were tested for fruitfulness by a commercial laboratory. The first, second, third and fourth buds were analyzed and subsequent fruitfulness (clusters per bud) predicted. Actual bud fruitfulness was then determined at harvest. There was very poor correlation between bud fruitfulness predicted by the commercial lab and that which

actually occurred. The lab underestimated bud fruitfulness by nine-fold for the basal bud, eight-fold for the second bud, two-fold for the third bud, and three-fold for the fourth bud, Table 2.

Production and fruit quality: Retaining 16 spurs that were 1-bud, 2-bud, 3-bud or 4-buds in length increased the clusters per vine from 14, 25, 38, to 42 clusters, respectively. Maximum berry weight occurred with a crop load of 14 or 25 clusters per vine. Over-cropping occurred with 38 clusters per vine and dramatically worsened with 42 clusters. Berry weight averaged over 14.6 grams when vines carried 25 clusters, but dropped to 13.2 and 11.5 grams per berry when vines carried 38 and 42 clusters, a 9.5% and 21% decrease, respectively.

Over-cropping affected both sugar and color development, Photos 2. Vines with 25 clusters per vine accumulated 16.5 °brix by September 20th. This dropped to 13.2 and 11.5 °brix for vines carrying 38 clusters and 42 clusters. Color development was rated good for the normally cropped vines with over 90% of the clusters harvestable on September 20th. Over cropped vines had poor color development with less than half of the fruit with enough color to meet USDA standards by September 20th, Table 3.

Conclusion: Results showed that crop load was balanced with 25 clusters per vine but over-cropped when 38 and 42 clusters were retained. Over cropping resulted in a marked reduction in berry size, sugar, and fruit color and berries were less firm.

Basal buds were unlikely to break with 3- and 4-bud spurs. Bud fruitfulness increased with the distal

position of the bud. Dormant buds were tested for fruitfulness by a commercial laboratory and there was very poor correlation between bud fruitfulness predicted by the lab and that which actually occurred.

In this study, it was best to prune Red Globe averaging sixteen two-bud spurs. The study suggests that to increase the vine's bud count, it would be best to increase the number of two-bud

spurs rather than going to three- and four-bud spurs. Few base buds and almost no latent buds push with long spurs. This makes it difficult to find good positioned spurs when pruning the following winter.

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Table 1. The effect of spur length on bud break, shoot numbers, and latent shoot development for Red Globe.

Treatments	Buds/Vine (#)	Bud Break from Spurs (%)	Shoot Number (shoots/spur)	Latent Shoots at base of spur (shoots/spur)
1-bud Spurs	16	100	1.0	2.4
2-bud Spurs	32	96	1.9	0.7
3-bud Spurs	48	71	2.1	0.6
4-bud Spurs	64	61	2.4	0.1
L.S.D. _{.05}		8	0.26	0.5

Note: Experimental vines were not shoot thinned nor did any cluster removal or cluster tipping/ lateral removal occur. All vines were pruned averaging 16 spurs.

Table 2. Comparison of dormant bud analysis prediction with actual fruitfulness measured at harvest for Red Globe.

Bud Position	Commercial dormant bud prediction (cluster/bud)	Bud Fruitfulness measured at harvest (clusters/bud)	Commercial prediction of spur fruitfulness (clusters/spur)	Spur fruitfulness measured at harvest (cluster/spur)
1st Bud	0.1	0.9	0.1 (1-bud spur)	0.9 (1-bud spur)
2nd Bud	0.1	0.8	0.2 (2-bud spur)	1.6 (2-bud spur)
3rd Bud	0.6	1.3	0.8 (3-bud spur)	2.4 (3-bud spur)
4th Bud	0.5	1.6	1.3 (4-bud spur)	2.6 (4-bud spur)

Note: Experimental vines were not shoot thinned nor did any cluster removal or cluster tipping/ lateral removal occur. All vines were pruned averaging 16 spurs.

Table 3. The effect of spur length on cluster numbers, berry weight, and fruit maturity for Red Globe.

Treatments	Clusters (#/vine)	Berry Wt. (g)	Soluble Solids (°brix)	Color (rating)
1-bud Spurs	14	14.2 (1 1/8 in. dia.)	17.0	good
2-bud Spurs	25	14.6 (1 1/8 in. dia.)	16.5	good
3-bud Spurs	38	13.2 (1 1/16 in. dia.)	14.8	poor
4-bud Spurs	42	11.5 (1 in. dia.)	12.7	poor
L.S.D. _{.05}	7	1.7	1.2	

Note: Experimental vines were not shoot thinned nor did any cluster removal or cluster tipping/ lateral removal occur. All vines were pruned averaging 16 spurs.

Photos 1

One-bud spur – note development of latent shoots at base of spur.



Two-bud spur – note that both buds developed shoots.



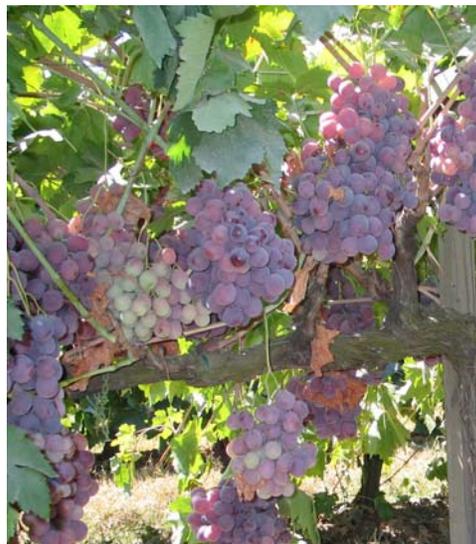
Four-bud spur – note only top two buds broke, also poor fruit color.

Photos 2

Twenty-five clusters per vine. Vine is within its capacity to mature the fruit (berry size, sugar, color).



Thirty-eight clusters per vine. Vine is over-cropped (smaller berries, low sugar, poor color).



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