crop care associates, inc.

Jim Konrad
CAMALIE VINEYARDS
257 Molin Ave
Sonoma, CA 95476

June 16, 2009

2009 BLOOM-TIME GRAPE PETIOLE ANALYSIS
Jim and Camalie Ranches

The attached bloom-time analysis report indicates that all vine nutritional needs are being met **EXCEPT** for those elements indicated after the vineyard sites listed below. Tissue analysis should be coupled with periodic soil analysis and visual observations made throughout the growing season to accurately separate true soil mineral deficiencies from soil structural problems, soil water excesses or deficits, and from vine physiological problems and/or soil pests. For some nutrients, levels are best assessed with two petiole samples per year, taken at bloom and veraison.

Critical value ranges based on University of California guidelines are presented in the bottom margin of the attached Plant Tissue Analysis Report data sheet. Growers are recommended to try and maintain nutrient levels in the *Adequate* range. For nutrient levels that are in the *Elevated* or *Excessive* range, if veraison petioles also show *Elevated* or *Excessive* values, inputs should be reduced by 50% or more (if applicable) until levels fall into the adequate range.

When post-harvest applications are recommended, nutrients should be applied after harvest, but before October 15th or 30% leaf fall. If this is not possible, these nutrients can be applied as late winter or budbreak applications.

Please review all data on a site-specific basis with your contracted Crop Care Associates, Inc. representative.

Site/Sample I.D.	Nutrient Concerns
Jim K1 CS 332/1103	Low NO_3-N Marginal Total N, Zn Elevated P, K
Jim K2U-K3U CS/1103	Low NO_3-N Marginal Total N, Cu, Zn Elevated P, K
Jim K4U-K5U CS/1103	Low Zn Marginal Total N, B, Cu, Zn Elevated P, K
Jim K6 CS/110R	Low Cu Marginal B, Zn Elevated P
Camalie 1 CS 337/110R	Low Cu Marginal Zn Elevated K, K;Mg
Camalie 2 CS 7/110R	Marginal Cu
Camalie 3 CS 337/3309	Low NO_3-N Marginal Total N, B, Cu, Zn
Camalie 4 CS 338/101-14	Marginal Cu, Zn

Commentary on Lab Results:

- **Nitrogen (NO_3-N and Total N):** Critical values vary according to variety, winemaking objectives, and yield targets:

Bloom	Target Yield	Deficient	Marginal	Adequate	Elevated	Excessive
				percent		
N-total		< 0.5	0.5 - 0.75	0.75 - 1.25	1.25 - 2.0	> 2.0
	tons/acre			ppm		
NO3-N	Low (2-3)	<50	50 - 100	100 - 400	400 - 800	>800
	Moderate (4-6)	<100	100 - 200	200 - 600	600 - 1000	>1000
	High (7 - 10)	<200	200 - 400	400 - 1000	800 - 1200	>1200

- Several factors should enter into your decision to apply nitrogen and when to make the application. Leaf size, color and grape growing objectives as well as time remaining before bloom and harvest are important considerations before adding any "in-season" nitrogen.

- Current practices appear to be supplying marginally low N at several sites.

- Both total N and nitrate N are low to marginally low at:

    - Jim K1 CS 332/1103
    - Jim K2U-K3U CS/1103
    - Camalie 3 CS 337/3309

- Calcium Nitrate can be used at 1-2 oz/vine in July and/or post-harvest if canopy conditions warrant.

Chloride: Elevated chloride levels may be due to chloride-based fertilizers (i.e. potassium chloride), dust-suppressants (ie. Dust-off), or irrigation system cleansers. If these materials have not been applied, a soil and/or water analysis is warranted to determine the cause of accumulation.

- Favorably low in all samples

Phosphorus (P):

- Current practices appear to be supplying adequate to elevated P. Note that the P is significantly lower at Camalie Block 1.

- A follow-up petiole analysis is suggested at veraison.

Potassium (K): Excessively high potassium levels may have detrimental impact on fruit quality by raising must K levels and pH.

- Current practices appear to be supplying adequate to elevated K for this time of the season.

- Suggest follow up petiole analysis at veraison at Camalie Block 1. Any K inputs should be avoided so as not to induce Mg deficiency.

Magnesium (Mg):

- Current practices appear to be supplying adequate Mg.
- The K:Mg is sufficiently high at Camalie Block 1 that a Mg deficiency may occur, including late-season bunch stem necrosis.
- A foliar application of magnesium is recommended in June @ 1 qt/acre. Magphos or Magflow at 1 qt/acre.
- A soil analysis is recommended to determine if dolomitic lime may be needed.

Calcium (Ca):

- Current practices appear to be supplying adequate Ca

Sodium (Na):

- Favorably low in all samples.

Iron (Fe):

- Current practices appear to be supplying adequate Fe for this time of the season.
- Iron levels are expected to increase during the summer as the temperatures warms.

Aluminum (Al): Aluminum toxicity is caused by extremely low soil pH values (<5.0) and is frequently coupled with phosphorus deficiency. If acidic soil conditions exist, soil sampling is recommended to best determine aluminum levels.

- Current practices appear to be supplying adequate Al.

Manganese (Mn): Elevated and excessive manganese levels may be an indicator of poor soil drainage, strongly acidic soil pH, a recent foliar application, or all of these sources.

- Adequate in all samples.

Boron (B): Boron toxicity reduces berry set and causes reddish-maroon freckling around basal leaf margins. Boron deficiencies may also reduce berry set.

- Current practices appear to be supplying marginal B at:
    - Jim K4U-K5U CS/1103
    - Jim K6 CS/110R
    - Camalie 3 CS 337/3309
- Suggest foliar pre-bloom inputs in 2010.
- Boron10 @ 1 pt/A applied 7-10 days pre-bloom
- Can also apply Solubor to the soil in a winter strip spray @ 2-3#/treated acre

Copper (Cu):

- Current practices appear to be supplying low to marginally low Cu.
- Include a Cu-containing fungicide like Champ 2F (1.3 pt/acre) or Nordox 25WG (1.25 #/acre) into the pre-bloom fungicide program in 2010.

Zinc (Zn):

- Current practices appear to be supplying low to marginally low Zn, especially at Jim K4U-K5U CS/1103.
- Suggest applying foliar Zn this summer and again pre-bloom in 2010.
- Foligro Zn at 1qt/acre.

Robert Gallagher

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Plant Tissue Analysis Report - Winegrapes

Laboratory No. 133511 **Date Reported:** 6/12/2009

For:

Project No. 09-200 BL

Client: CAMALIE VINEYARDS/JIM RANCH

Sampling Date	Lab ID#	Description Block / Variety Rootstock / Growth Stage	N Total Nitrogen %	NO3-N Nitrate Nitrogen ppm	Cl Chloride %	P Total Phosphorus %	K Potassium %	Mg Magnesium %	Ca Calcium %	Na Sodium %	Fe Iron ppm	Al Aluminum ppm	Mn Manganese ppm	B Boron ppm	Cu Copper ppm	Zn Zinc ppm
6/4/2009	1	K1 / CAB 332 1103P / 100% BLOOM	0.64	14	0.12	0.73	3.42	0.52	2.71	0.03	26	9	71	56	9	48
6/4/2009	2	K2U, K3U / CAB 1103P / 100% BLOOM	0.62	51	0.16	0.69	3.85	0.50	2.32	0.02	22	8	86	47	7	34
6/4/2009	3	K4U,K5U / CAB 1103P / 100% BLOOM	0.69	194	0.12	0.66	4.20	0.58	2.53	0.02	26	8	194	38	7	29
6/4/2009	4	K6 / CAB 110R / 100% BLOOM	0.86	588	0.15	0.69	2.95	0.49	2.66	0.02	28	11	105	32	5	32
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Desirable Levels for Grape petioles	Bloom-time	Low	<0.5	Depends on variety and yield target		<0.15	<1.0	<0.3	<1.0		Not Family Established		<20	<25	<5	<30
		Marginal	0.5-0.75			0.15-0.20	1.0-1.5	0.2-0.3	1.0-1.5				20-30	25-40	5-8	30-50
		Adequate	0.75-1.25		<0.5	0.25-0.60	1.5-3.0	0.3-0.8	1.5-3.5			<300	30-500	40-60	8-20	50-100
		Elevated	1.25-2.0		0.5-0.8	0.60 - 1.0	3.0-5.0	0.8-1.5	3.5-4.0			300-500	500-1000	60-150	>20	>100
		Excessive	>2.0		>0.8	> 1.0	>5.0	>1.5	> 4.0	0.5+		>500	>1000	> 150		

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Plant Tissue Analysis Report - Winegrapes

Laboratory No. 133510 **Date Reported:** 6/12/2009

For:

Project No. 09-200 BL

Client: CAMALIE VINEYARDS

Sampling Date	Lab ID#	Description Block / Variety Rootstock / Growth Stage	N Total Nitrogen %	NO3-N Nitrate Nitrogen ppm	Cl Chloride %	P Total Phosphorus %	K Potassium %	Mg Magnesium %	Ca Calcium %	Na Sodium %	Fe Iron ppm	Al Aluminum ppm	Mn Manganese ppm	B Boron ppm	Cu Copper ppm	Zn Zinc ppm
6/4/2009	1	BLK #1 / CAB 337 110R / 100% BLOOM	0.87	765	0.37	0.35	4.17	0.33	1.81	0.03	42	20	39	40	4	32
6/4/2009	2	BLK #2 / CAB 7 110R / 100% BLOOM	0.89	427	0.25	0.53	2.91	0.53	1.78	0.02	43	16	171	41	6	55
6/4/2009	3	BLK #3 / CAB 337 3309 / 100% BLOOM	0.69	22	0.16	0.53	2.29	0.78	1.62	0.03	28	7	211	36	6	42
6/4/2009	4	BLK #4 / CAB 338 101-14 / 100% BLOOM	0.89	524	0.24	0.46	2.54	0.49	1.94	0.03	24	7	50	42	6	46
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Desirable Levels for Grape petioles	Bloom-time	Low	[illegible]	Depends on variety and yield target		[illegible]	[illegible]	[illegible]	[illegible]		Not Firmly Established		[illegible]	[illegible]	[illegible]	[illegible]
		Marginal	0.5-0.75			0.15-0.20	1.0-1.5	0.2-0.3	1.0-1.5				20-30	25-40	5-8	35-50
		Adequate	0.75-1.25		<0.5	0.25-0.60	1.5-3.0	0.3-0.8	1.5-3.5			<300	30-500	40-60	8-20	50-100
		Elevated	1.25-2.0		0.5-0.8	0.60 - 1.0	3.0-5.0	0.8-1.5	3.5-4.0			300-500	500-1000	60-150	>20	>100
		Excessive	>2.0		>0.8	> 1.0	>5.0	>1.5	> 4.0	0.5+		>500	>1000	>150		