

## 2004 AVERN Enology Research Survey

### CATEGORY

	% yes	% no	% high priority	% medium priority	% low priority
<b>Composition</b>					
Impact of Viticultural Practices on Wine/Juice Quality	100	0	91.3	4.3	4.3
Crop Load, Fruit Composition and Wine Quality	100	0	73.9	21.7	4.3
Color and Phenolic Composition	91.3	8.7	81.8	9.1	9.1
Maturity, Fruit Composition and Wine Quality	95.7	4.3	77.3	18.2	4.5
Effects of Spacing, Trellising, Canopy Management on Wine Quality	95.7	4.3	78.3	17.4	4.3
Vineyard Residues on Wines (Fermentations & Organoleptic)	95.7	4.3	63.6	31.8	4.5
Identification and Characterization of Aroma and Flavor Compounds in Wine	95.7	4.3	63.6	27.3	9.1
Influence of Winemaking Practices on Wine Composition and Flavor	95.7	4.3	81.8	13.6	4.5
Influence of individual Tannin Compounds on Wine Mouth Feel	100	0	59.1	22.7	18.2
Method to Remove "green" or Unripe Flavors in Wine	95.7	4.3	90.9	9.1	0
<b>Fermentation and Processing</b>					
Effects of Yeast and Bacteria on Wine					
Influence of Yeast Strains on Fermentation Kinetics and Sensory Properties	87	13	70	25	5
Yeast/ML Compatibility	78.3	21.7	63.2	31.6	5.3
Effects on Wine Quality	87	13	70	30	0
Improved Inoculation Methods	73.9	26.1	66.7	22.2	11.1
Malolactic Fermentations: Characteristics, Nutrient Requirements and Flavor Production	87	13	75	25	0
Rapid Malolactic Fermentations: Methods to Accomplish	82.6	17.4	60	35	5
Characterizing Incomplete ML Fermentations	78.3	21.7	73.7	15.8	10.5
Nutritional Status for ML	78.3	21.7	63.2	31.6	5.3
Stuck/Sluggish Fermentation Factors	82.6	17.4	65	30	5
Sulfide Production - ID and Control	82.6	17.4	85	10	5
Comparison of Natural and Inoculated Fermentations	73.9	26.1	52.6	31.6	15.8
Management and/or Elimination of Lactobacillas During ML Fermentations	78.3	21.7	84.2	10.5	5.3
Biological Modification of Yeast/Bacteria to Improve Fermentation	78.3	21.7	68.4	10.5	21.1
Reduction of Ethyl Carbamate in Wines	78.3	21.7	47.4	36.8	15.8
Processing					
Yeast Nutrient Requirements and Metabolism During Fermentation	91.3	8.7	71.4	23.8	4.8
Use of Enzymes for Improving Clarification/Filterability (botrytis/rot)	87	13	76.2	23.8	0
Use of Enzymes for Flavor Enhancement, Color and Phenolic Extraction	95.7	4.3	77.3	22.7	0

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Thermo-Vinification	73.9	26.1	36.8	47.4	15.8
<b>Contact</b>					
Phenolics - Composition	81	19	63.2	26.3	10.5
Phenolics - Extraction	95.2	4.8	57.1	33.3	9.5
Phenolics - Modification	95.2	4.8	60	30	10
Extraction of Color and Flavor Components in Red Wine Making	95.5	4.5	66.7	28.6	4.8
Modification of Color Components and Color Stabilization	93.8	6.2	66.7	20	13.3
<b>Process Technology</b>					
Reduction of Alcohol	60.9	39.1	37.5	25	37.5
Acid Reduction	82.6	17.4	47.4	36.8	15.8
Reduction of Volatile Acidity	81.8	18.2	52.4	38.1	9.5
Reduction of Acetaldehyde in Wines	87	13	40	50	10
Process Modeling/Optimization	77.3	22.7	45	35	20
<b>Method Development</b>					
Varietal Identification of Wines	72.7	27.3	25	45	30
Measurement of Nitrogen Status	95.7	4.3	47.6	47.6	4.8
New Process Technologies (e.g. Flotations)	91.3	8.7	42.9	52.4	4.8
<b>Stability and Filtration</b>					
Alternatives to Bentonite	78.3	21.7	52.6	42.1	5.3
Protein Stability	91.3	8.7	60	35	5
New Filtration Technology	87	13	42.9	57.1	0
Sulfide Removal	87	13	55	35	10
Cold Stability	91.3	8.7	65	35	0
Heat Stabilization and Clarification	90.9	9.1	42.1	36.8	21.1
Effects of Filtration on Wine Quality	95.7	4.3	52.4	42.9	4.8
Elimination of Pinking in White Wines	69.6	30.4	41.2	17.6	41.2
<b>Bottling</b>					
Alternative Bottle Closures	87	13	55	20	25
Control of Cork Taint	87	13	61.9	14.3	23.8
<b>Aging</b>					
Aging of Wines: Bottle, Tank & Barrel (e.g., UTA - Untypical Aging)	91.3	8.7	71.4	28.6	0

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Oak Extraction	91.3	8.7	50	45	5
Alternatives to Barrel Aging	87	13	55	40	5
Control of Micrological Contaminates in Barrel Aging	91.3	8.7	72.2	22.2	5.6
Oxidation and Browning	91.3	8.7	60	30	10
Modification of Color Components	81.8	18.2	60	40	0
<b>Environmental</b>					
Ion Exchange Waste	47.8	52.2	41.7	41.7	16.7
Ethanol Emissions	43.5	56.5	41.7	41.7	16.7
Waste Water, Pomace and Lees Disposal	78.3	21.7	35.3	52.9	11.8
<b>Other</b>					
Quality Enhancement in Brandy Production	29.4	70.6	36.4	9.1	54.5
Production Economics	50	50	58.3	16.7	25
By-Product Utilization	41.2	58.8	18.2	27.3	54.5

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<b>Production</b>					
<b>Vineyard Establishment</b>					
Site-Specific Planting - GPS/GIS Applications	45.8	54.2	26.7	20	53.3
Vineyard Design (Trellising, Training, Spacing)	70.8	29.2	15.8	52.6	31.6
Determining Optimum Pruning Levels (balanced pruning)	75	25	42.1	47.4	10.5
Soil and Climate Evaluation Methods	66.6	33.3	31.6	36.8	31.6
<b>Vineyard Mechanization</b>					
Improvement of Canopy Microclimate (Disease Control, Fruit Composition, Quality Enhancement)	79.2	20.8	71.4	19.1	9.5
Evaluation of Vine Training and Trellising Systems	75	25	35	50	15
Influence of Canopy Mangement Practices on Vine Performance and Fruit Composition	87.5	12.5	72.7	18.2	9.1
<b>Vine Physiology</b>					
Canopy Development and Vine Phenology	70.8	29.2	47.4	42.1	10.5
Environmental Effects on Fruity Development and Composition	75	25	52.6	42.1	5.3
Regulation of Bud Fruitfulness and Fruit Set	83.3	16.6	50	40.9	9.1
Regulation of Fruit Development, Ripening, Composition and Flavor	87.5	12.5	52.4	42.9	4.8
Regulation of Photosynthesis and Carbon Partitioning	70.8	29.2	31.6	47.4	21
<b>Irrigation</b>					
Influence of Plant and Soil Water Status on Vine Performance and Fruit Composition	66.6	33.3	15.8	47.4	36.8
Vine Water Use (Excess, Deficit, Optimum)	66.6	33.3	15.8	47.4	36.8
Monitoring Plant and Soil Water Status	62.5	37.5	21	47.4	31.6
<b>Fertilization</b>					
Foliar Amendments	83.3	16.7	75	25	0
Organic Farming Practices	75	25	38.9	44.4	16.7
Cover Crops	79.2	20.8	45.4	36.4	18.2
Micronutrients (Zn, B)	95.8	4.2	56.5	30.4	13.1
Macronutrients (N, P, K, Mg)	91.7	8.3	63.2	26.3	10.5
Soil Amendments	95	5	63.6	31.8	4.5
Fertigation	54.2	45.8	37.5	43.8	18.8
<b>Vineyard Mechanization</b>					
Pruning	54.2	45.8			
Harvesting	50	50	33.3	33.3	33.3
Crop Load Adjustment	65.2	34.8	21.4	42.9	35.7
Mechanization Systems	50	50	46.7	33.3	20
Cultivation and Weed Management	83.3	16.7	52.4	33.3	14.3
Canopy Management Mechanization	58.3	41.7	43.8	37.5	18.8

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### Other

Fruit Sampling and Crop Estimation Procedures	75	25	44.4	33.3	22.2
Methods for Monitoring Fruit Ripening and Maturity	87.5	12.5	65	30	5
Impact of Viticultural Practices on Fruit Composition and Fruit Quality	91.7	8.3	71.4	28.6	0
Cold Hardiness	83.3	16.7	52.4	23.8	23.8
Dormancy Management in Low-Chill Regions	62.5	37.5	29.4	52.9	17.6
Vineyard Economics	75	25	42.1	36.8	21.1
Erosion Control	58.3	41.7	27.8	33.3	38.9

### Diseases

#### Viral

Fanleaf Virus	58.3	41.7	40	46.7	13.3
Leafroll	62.5	37.5	37.5	50	12.5
Latent Viruses	62.5	37.5	37.5	37.5	25
Graft-transmissible Agents (GTA's)	58.3	41.7	37.5	43.8	18.8
Stem Pitting	50	50	35.7	42.9	21.4
Viroids	50	50	28.6	42.9	28.6

#### Fungal

Powdery Mildew	95.8	4.2	78.3	17.4	4.3
Downy Mildew	95.8	4.2	73.9	17.4	8.7
Eutypa and Other Cankers	91.7	8.3	56.5	39.1	4.3
Oakroot Fungus	58.3	41.7	50	27.8	22.2
Black Rot/Phomopsis	87.5	12.5	63.6	22.7	13.6
Measles	66.7	33.3	42.1	42.1	15.8
Bunch Rots	87.5	12.5	68.2	31.8	0
Botrytis	95.8	4.2	72.7	22.7	4.5
Sour Rot	91.7	8.3	60.9	34.8	4.3

#### Bacterial

Pierce's Disease	70.8	29.2	40	35	25
Crown Gall	95.8	4.2	68.2	31.8	0

#### Other

Black Goo/Young Vine Decline	87.5	12.5	42.1	47.4	10.5
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### Integrated Crop Management (ICM)

Pesticide Residue Analysis	75	25	83.3	11.1	5.6
Vineyard Fungicide Effects on Fermentation and Wine Defects	83.3	16.7	66.7	33.3	0
Pesticide Registration	70.8	29.2	44.4	22.2	33.3
Integrated Pest Management - IPM (Chemical & Alternative Control of Insects/Mites)	87.5	12.5	61.9	23.8	14.3
Mycoplasmal Organisms	62.5	37.5	52.9	29.4	17.6
Electrostatic Sprayers (Efficacy and Residue Studies)	66.7	33.3	55.6	27.8	16.7
Improved Pesticide Application Technology	87.5	12.5	75	25	0
Alternatives to Methyl Bromide	45.8	54.2	28.6	21.4	50
Economic Thresholds of Pesticide Applications	79.2	20.8	47.4	31.6	21.1

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Sustainable Production Practices	75	25	61.1	22.2	16.7
Cultural Practices	83.3	16.7	61.9	28.6	9.5
<b>Pests</b>					
<b>Above Ground</b>					
Leafhoppers (Including Sharpshooters)	75	25	40	40	20
Mites	79.2	20.8	45	35	20
Cut Worms	87.5	12.5	42.9	52.4	4.8
Grape Berry Moth	91.7	8.3	66.7	33.3	0
Beneficials (e.g., Spiders, Wasps)	79.2	20.8	52.4	38.1	9.5
Vertebrates (e.g., Deer, Rabbits, Voles, Birds)	70.8	29.2	55.6	38.9	5.6
Mealybug	70.8	29.2	31.6	42.1	26.3
Omnivorous Leafroller/Orange Tortrix	62.5	37.5	29.4	35.3	35.3
<b>Below Ground</b>					
Vertebrates (e.g., Gophers)	66.7	33.3	35.3	41.2	23.5
Grape Root Bore	66.7	33.3	44.4	44.4	11.1
Grape Worm	75	25	31.6	47.4	21.1
Nematodes	83.3	16.7	38.1	47.6	14.3
Phylloxera	75	25	42.1	31.6	26.3
<b>Plant Materials</b>					
<b>Existing Materials</b>					
Rootstock Evaluation:	82.6	17.4	61.1	27.8	11.1
Pest and Disease Resistance (e.g., Phylloxera, Nematodes, Oakroot Fungus, Fanleaf Virus)	70.8	29.2	68.8	25	6.3
Soil Adaptation (e.g., Salinity, Boron)	66.7	33.3	64.7	29.4	5.9
Drought Tolerance	62.5	37.5	66.7	33.3	0
Appropriate Vigor	70.8	29.2	62.5	37.5	0
Cold Hardiness	70.8	29.2	68.8	31.3	0
Fruit Quality	70.8	29.2	70.6	29.4	0
Mineral Nutrition	70.8	29.2	75	25	0
Clonal Selection (Searching for Naturally Occurring New Clones of Existing Varieties)	66.7	33.3	75	18.8	6.3
Clonal Evaluation (Testing Existing Clones, Including Newly Imported Clones)	82.6	17.4	58.8	35.3	5.9
Fruit Quality	75	25	55.6	33.3	11.1
Regional Adaptation	82.6	17.4	63.2	26.3	10.5
Disease Resistance	83.3	16.7	66.7	22.2	11.1
Yield	82.6	17.4	66.7	22.2	11.1
Vigor	83.3	16.7	63.2	21.1	15.8
Variety Evaluation	82.6	17.4	68.4	21.1	10.5
<b>Plant Materials (continued)</b>					
<b>Improved Materials</b>					
Rootstock Breeding:	66.7	33.3	50	25	25
Soil Adaptation (e.g., Salinity, Boron)	62.5	37.5	50	18.8	31.3

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Disease Resistance (e.g., Fanleaf Virus, Oakroot Fungus)	62.5	37.5	62.5	18.8	18.8
Pest Resistance (e.g., Phylloxera, Nematodes)	66.7	33.3	58.8	23.5	17.6
Drought Tolerance	58.3	41.7	52.9	17.6	29.4
Appropriate Vigor	66.7	33.3	56.3	25	18.8
Fruit Quality	66.7	33.3	62.5	18.8	18.8
Graft Compatibility (Varietal/Rootstock)	66.7	33.3	50	31.3	18.8
<b>Clonal Improvement</b>					
Disease Resistance (e.g., Fanleaf Virus, Oakroot Fungus)	62.5	37.5	40	40	20
Regional Adaptation	62.5	37.5	50	25	25
Fruit Quality	62.5	37.5	53.3	26.7	20
Vigor	66.7	33.3	37.5	37.5	25
Yield	66.7	33.3	40	33.3	26.7
<b>Rootstock Biology</b>					
Rootstock Response to Pests and Diseases (e.g., Phylloxera, Nematodes, Oakroot Fungus)	66.7	33.3	47.1	41.2	11.8
Rootstock Response to Environmental Stresses (e.g., Salinity, Drought, Boron)	66.7	33.3	47.1	35.3	17.6
Soil Nutrients	66.7	33.3	47.1	35.3	17.6
Water Use	70.8	29.2	38.9	38.9	22.2
Impact of Cultural Practices	70.8	29.2	38.9	44.4	16.7
Rootstock Effect on Scion (e.g., Vigor, Fruit Quality, Fruit Set)	75	25	38.9	44.4	16.7