



Industry Priorities: An Update

ARS-Grape Industry Workshop
July, 2007



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Project info provided by

- The American Vineyard Foundation
- The California Table Grape Commission
- Industry project collaborators
 - Nick Dokoozlian, Jerry Lohr, Bill Nelson, Chris Savage, Mary Wagner, Jennifer Jo Wiseman

Recap of Priority Theme Areas

- Understanding and improving quality
- Consumer insights, nutrition and community
- Processing and production efficiency
- Sustainable practices
- Extension and outreach education
 - Integrated last December

5th Theme!

Keeping the Priorities Relevant

December 2006 workshop:

- Review research and extension activities underway
- Examine and update NGWI industry research and extension/outreach education priorities (*details included in your notebook*)
- Develop action plans to achieve R&E objectives and industry deliverables



Understanding and Improving Quality:

Recent Progress

Quality: Recent Progress

Identify and quantify color, flavor, aroma, mouthfeel targets; new techniques to predict maturity, harvest date, product quality

■ Research Funded via AVF



□ Grape Maturity & Wine Sensory Properties

- Hildegard Heymann, \$85,000

□ Viticultural Practices & Wine Composition

- Jim Wolpert, \$24,000

Quality: Recent Progress *(cont.)*

Develop a network to standardize sensory descriptors of grape and grape projects

Establish a standard lexicon (language) to describe the sensory characteristics of wine

- **Objective:** to deliver a documented tool for the industry to understand and quantify the sensory characteristics of wine
 - Standard lexicon of defined and referenced attributes of wine
 - Standard evaluation procedures
 - Suggested use



Standard Wine Lexicon (*cont.*)

E & J Gallo Winery

Proprietary wine
lexicon will be
donated to the public



Name:		Date:			
		Sample			
		AROMA	FLAVOR	AROMA	FLAVOR
TOTAL AROMA / FLAVOR		OVERALL SENSATION IN THE MOUTH			
FRUIT		Sweet			
Citrus		Sour			
Tropical		Bitter			
Tree Fruit		NP			
Red Fruit		Alcohol Burn			
Fresh		Astringency			
Jammy		Spritz			
Dark Fruit		Mouth Roughness			
Fresh		Viscosity			
Jammy		Mouth Coating			
FLORAL		Oily/greasy/waxy			
Rose		Chalky			
White flower		AFTERTASTE			
GREEN/HERBACEOUS/VEGETATIVE		TOTAL AFTERTASTE			
Fresh green		Fruity			
Cooked/canned		Floral			
Eucalyptus / Mint		Green/Herbaceous/Vegetative			
Herbaceous / Dried		Spice			
SPICE		Oakly/Woody/Nutty			
Brown		Sweet Aromatics			
Black		Microbiological / Animal			
OAKY/WOODY/NUTTY		Chemical			
Resinous		Earthy			
Raw wood		Inorganic			
Medium toast/nutty		Total Aftertaste after 1 minute			
Dark roast					
SWEET AROMATICS					
Caramelized/ Vanilla / Browned					
Dairy					
MICROBIOLOGICAL / ANIMAL					
Animal / Cat pee					
Fermented (sweaty, lactic, yeasty)					
CHEMICAL					
Pungent/alcohol/vinegar					
Sulfur					
Petroleum					
Phenol/band-aid					
Paper/cardboard					
EARTHY					
Earthy					
Moldy					
INORGANIC					

ATTRIBUTE	DESCRIPTION
FRUIT	overall rating of fruit intensity
Citrus	grapefruit, lemon, orange, lime, peel
Tropical	pineapple, melon, banana, mango, lychee, kiwi
Tree Fruit	apricot, peach, apple, quince, nectarine, pear
Red Fruit	fresh red currant, raspberry, strawberry, red cherry, cranberry
Red Jammy	jammy/cooked red currant, raspberry, strawberry, red cherry, cranberry
Dark Fruit	fresh blackberry, blueberry, black currant (cassis), black cherry, dark plum
Dark Jammy	jammy/cooked blackberry, blueberry, black currant (cassis), black cherry, dark plum
Dried Fruit	raisins, currants, fig
FLORAL	overall rating of floral
Rose	rose
White	jasmine, gardenia, orange blossom, honeysuckle, lilac
GREEN HERB VEG	overall rating of green intensity
Fresh Greens	cut green grass, viny, soy, green, green banana, cucumber, bell pepper
Cooked / Canned	cooked/canned green beans, asparagus, green olive, black olive, artichoke, tomato, mushroom
Eucalyptus Mint	eucalyptus, mint
Herb Dried	dried herbs, dried lavender, hay, straw, tea, tobacco
SPICE	overall rating of spice intensity
Spices	cloves, cardamom, nutmeg, ginger
Black	licorice, sesame, black pepper
OAKY/WOODY/NUTTY	overall rating of wood intensity
Raw Wood	pine, cedar, sap, pitch
Raw Wood	cedar, spruce, fir, pine, saw dust, wood shavings
Medium Toasted Oak Nutty	toasted wood, walnut, hazelnut, almond, toasted malt, roasted nut, peanut
Dark Roast	smoky, burnt toast, coffee, dark chocolate
SWEET AROMATICS	overall rating of sweet aroma intensity
Caramelized Vanilla Brown	honey, soy, sauce, molasses, vanilla, caramelized sugar, brown sugar, caramel
Dairy	butter, butterscotch, coconut
MICRO ANIMAL	overall rating of microbiological/animal intensity
Animal / Cat Pee	burmyard, gamey, leather, venison, soapy, musk, wet wool, wet dog, goatly, mousy, horsey
Fermented	Yogurt, smelly, leesy, cheesy
CHEMICAL	overall rating of chemical intensity
Pungent Alcohol/Vinegar	alcohol, vinegar, ethyl acetate, solvent
Sulfur (Band-aid)	burnt match, rotten eggs, cabbage, skunk, garlic, onion, natural gas
Petroleum	bitumen, diesel, kerosene, plastic, tar, waxy
Phenol/Band-aid	medicinal, band-aid
Paper/Cardboard	wet paper, wet cardboard
EARTHY	overall rating of earthy intensity
Earthy	sooty, cool, plating soil
Moldy	mushroom, dusty, moldy
Biogenic	mineral, wet rocks, concrete, metallic, fire
Mouth Coating	includes the mouth feel sensations of chemical feeling factors (alcohol burn, astringency and spritz) and texture (mouth roughness, viscosity and mouth coating), may also include basic taste sensations but not the actual taste, what you feel when wine is in your mouth, what sensations you have on the surfaces of your mouth after expectoration, an overall perception of what is felt in the mouth
OVERALL SENSATION IN THE MOUTH	
Sweet	sweet
Sour	sour/acidic
Bitter	bitter
Alcohol Burn	burning/warming sensation on surfaces of mouth
Astringency	drying sensation on tongue and pulling in and tightening of cheeks and mouth surfaces, sensed without moving tongue over surfaces
Spritz	carbonation, tingling, prickle on the tongue
Mouth Roughness	roughness of mouth surfaces, sensed by running tongue over surfaces, especially roof of mouth, includes roughening of tongue's surface
Viscosity	thickness, weight of wine, increase or decrease in force necessary to move tongue through liquid, must be evaluated while wine is in mouth
MOUTH COATING	any sensation that a coating has been left on the surfaces of the mouth after expectoration, includes sensations by moving tongue over surfaces of the mouth, roof, teeth, gums, etc.
Chalky	Subcategory of mouth coating, chalky, powdery coating perceived after expectoration
Oily/Creamy/Waxy	Subcategory of mouth coating, feeling of an oily, slick, greasy coating left on the surface of the mouth after expectoration
TOTAL AFTERTASTE	overall aftertaste intensity of all flavors and sensations at their peak after expectoration
Aftertaste Fruity	includes all fruit categories
Aftertaste Floral	includes all floral aromatics
Aftertaste Green Herb Veg	includes all green categories
Aftertaste Spice	includes all spice categories
Aftertaste Oakly/Woody/Nutty	includes all wood categories
Aftertaste Sweet Aromatics	includes all sweet aromatic categories
Aftertaste Micro Animal	includes all microbiological/animal categories
Aftertaste Chemical	includes all chemical categories
Aftertaste Earthy	includes all earthy categories
Aftertaste Biogenic	includes all inorganic aftertaste
TOTAL AFTERTASTE @ 1 MINUTE	overall aftertaste intensity of all flavors and sensations, 1 minute after expectoration

Full Ballot & Attribute Definitions

Quality: Recent Progress *(cont.)*

New varieties, rootstocks and germplasm

■ National Clean Plant Network

□ Objectives:

- Establish and maintain regional centers to encourage and facilitate the use of plants for planting that are pathogen and pest free.
- Nation-wide network of grape facilities to include New York, Missouri, Washington, Mid-Atlantic region and California

□ Major stakeholders and organizers:

- USDA-CSREES
- APHIS
- Universities
- Industry

National Clean Plant Network

■ Current status:

- Two major organizational meetings have been held to date
 - Davis – Fall 2005
 - Maryland – May 8-9, 2007

■ Next Steps:

- Once funding is assured through farm bill or other means,
 - Develop plans for production of clean plants, increase blocks and certification regimes



Consumer Insights, Nutrition and Community:

Recent Progress

Consumer: Recent Progress

Nutrition & Health

NGWI Grape Phytonutrient Meeting—May 21st, 2007

- **Objective:** to discuss methods to increase consumer awareness of the health benefits of grapes and grape products.



Grape Phytonutrient Meeting (*cont.*)

Outcomes: development and implementation of several key strategies and tactics:

- **Coordinate efforts to secure more funding for grape/grape product health research**
 - Grape, juice and wine industries to contribute research dollars to fund initial efforts; secure additional funding from federal sources

- **Focus the direction of NGWI future health research initiatives**
 - Conduct gap analysis of existing research
 - Establish a scientific advisory panel
 - Create a strategic plan for joint research on grapes and health.



Grape Phytonutrient Meeting (*cont.*)

■ Key Strategies (*Cont.*)

- Influence policy to effect change in the official biomarkers used by the FDA for heart disease to include those that grapes and grape products impact
 - Enlist the support of reputable health and scientific organizations such as the American Heart Association
 - Organize an international scientific symposium on grapes/grape products and health in 2008. Possible locations include the NIH campus, the American Association for the Advancement of Science or the Congressional Wine Caucus.



Grape Phytonutrient Meeting (*cont*)

- **Key Strategies (*Cont.*)**
 - **Conduct outreach to influentials and consumers on the health benefits of grapes and grape products**
 - Create a strategic plan for influential and consumer outreach on grapes/grape products and health
 - Invite influentials to the international scientific symposium on grapes/grape products and health.



Processing and Production Efficiency:

Recent Progress

Efficiency: Recent Progress

Optimize vineyard production systems for cost, quality and the environment

- Participation in USDA research strategy planning
 - ARS National Program 305: Crop Production—5 year plan (Feb, 2007)
 - National Workshop: Engineering Solutions for Specialty Crops (April, 2007)



Perennial Crop Sub-platforms

**Industry Input
For NP305**

**Core
Research Platform**

**Production
Efficiency/
Quality**

-Technology Transfer

-Economic Impact
Assessment

ESSENTIAL OUTCOMES

**Production
practices**

Low input cultural practices;
improved training systems
and pc designs

**Mechanization
and automation**

Reduction of labor and
production inputs;
improved spray technology

Soil and Water

Soil health and nutrient
availability; water use and
quality

Environment

Zero negative impact of
production systems on the
environment

**Food quality
and safety**

Size, color, flavor, texture;
free of contaminants and
defects

Engineering Solutions for Specialty Crop Challenges—Workshop

- Sponsored by NSF, NASA, ARS and CSREES and facilitated by SCRTs
- Focused on tree fruits & nuts, citrus, brambles/berries, grape & wine, and horticulture
- **Objective:** to create an R&D vision that addresses industry needs for productivity, efficiency, and profitability through the application of engineering science and technology

Engineering Workshop *(cont.)*

- Wine and Grape Industry High Priorities
 - Better spray technologies
 - Mechanization of cultural practices
 - Pruning, cane cutting
 - Crop regulation (leaf, shoot, fruit thinning)
 - Canopy management
 - Harvesting
 - Water management
 - Waste stream management
 - Energy use/capture/renewal
 - Food Safety

Engineering Workshop (*cont.*)

■ Next Steps

- Complete workshop white paper
- Encourage multi-disciplinary, cross-agency teams
- SCRT partnerships



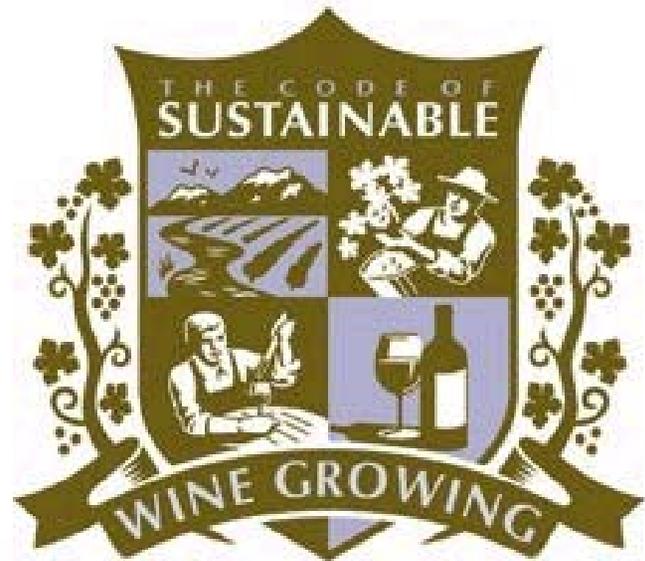
Sustainable Practices: *Recent Progress*

Sustainability: Recent Progress

Manage the waste streams of grape and grape product processing/packaging facilities in a sustainable manner



- Research Funded by AVF
 - Winery Best Practices for Sustainability
 - Robert Chrobak, \$71,000



Winery Best Practices Project *(cont.)*

Overview

- Project will consolidate work from multiple industries to produce a Best Practices document for the management of:
 - winery and vineyard water,
 - wastewater, and
 - energy resources
- Easy-to-use working templates will be developed to help facilities understand and evaluate their options as it relates to managing and improving the above areas
- Outreach and technology transfer meetings will be held around the country to educate interested grape and wine industry members



Winery Best Practices Project (*cont.*)

Project Outline and Schedule

- The final document will be organized as follows:
 - Section 1: Introduction
 - Section 2: Planning and program organization
 - Section 3: Assessment Steps
 - Section 4: Feasibility Analysis Steps
 - Section 5: Implementation Guidelines
 - Attachments: Including working templates and resource information with economic models to help operators choose BMP's that best fit their situation

- Schedule
 - Document will be finalized and presented at a kick-off meeting at the Unified Wine and Grape Symposium in January 2008. Outreach meetings will begin immediately thereafter.

Next Steps

- Continue to build partnerships
 - Scientific community
 - Government partnerships
 - Industry stakeholders
 - SCRTs collaborations



Extension & Outreach Education: *Recent Progress*

Current Situation in Vit/Enol Extension in the United States

- Still have wineries in all 50 states
- Rapid expansion of wine and grape industries in many regions
 - New and emerging viticulture and enology technologies
 - Strong interest from wine consumers to become producers
 - Support from funding, government and education partners
- Quality and production problems
 - Inexperience of new producers
 - Lack of sufficient research and extension efforts in problem areas

Extension is About People

■ New resources

- Texas – 4 viticulture and 1 enology
- Missouri – extension and enology
- New York –
- Maryland, Virginia, Kentucky, Tennessee

National Viticulture & Enology Extension Leadership Conference

Nashville, TN - March 28-29

- Attendees: 28
- Representation: 18 states + Canada
- Organizers
 - Dr. Ed Hellman, Texas A&M
 - Dr. Jim Wolpert, UC Davis
 - Dr. Keith Striegler, Univ of Missouri
 - Mark Chien, Penn State
 - Dr. David Lockwood, Univ of Tennessee

Action Items

- Investigate licensing opportunities/requirements for existing distance education classes.
- Prepare an inventory of existing distance education coursework.
- Conduct survey and compile inventory of educational resources for new producers
- Investigate potential for access to existing repository systems for sharing electronic resources.

Working Groups

- National Distance Education V&E Certificate Program
- Investigate opportunities and develop strategies for establishing a national distance education viticulture and enology certificate program.
- Multi-state Videoconferencing Experiment
- Plan and deliver a workshop via videoconferencing to multiple locations.

Proposed NGWI Extension and Outreach Priorities

- Create and fund a position of National Coordinator for Extension Viticulture and Enology
- Encourage career development of viticulture and enology outreach educators
- Develop a national viticulture and enology distance education certificate program
- Develop regional and national educational materials on viticulture and enology
- Increase and improve vineyard and winery workforce expertise

Develop Regional and National Education Materials for Vit/Enol

Strategies:

- Develop a national viticulture and enology website
- Develop a winery startup guide
- Develop regional grape production manuals
- Develop regional vineyard site selection manuals
- Develop regional websites to deliver local viticulture and enology educational materials
- Develop regional sustainable production guidelines

Improve Vineyard and Winery Workforce Expertise

- Strategies:
- Develop curriculum in vineyard and winery workforce training for community colleges
- Produce Spanish-language videos for vineyard and cellar workers
- Create a repository of educational materials on worker safety and health



Viticulture Best Management Practices Workshops in Missouri and Arkansas

Development of a National Grape Registry 2006-2007



www.ngr.ucdavis.edu

NGR Researchers:

Ed Stover, USDA/ARS National Clonal Germplasm Repository

Deborah Golino, Foundation Plant Services

Nancy Sweet, Foundation Plant Services

➤ **Objective:** provide industry with availability status and profiles for all available grape material in the United States – wine, table, juice, raisins, rootstock

Plant material currently accessible at variety level with extensive synonym lists

Contains user-friendly search feature for varieties and synonyms

Many public and commercial sources for grape material

View Collection

Name: Foundation Plant Services
 Address: University Of California
 One Shields Avenue
 City: Davis
 State: CA
 Zip: 95616
 Phone: (530) 752-3590
 Fax: (530) 752-2132
 Contact: Tracy Pinkalton
 Website: <http://fps.ucdavis.edu>
 Email: fps@ucdavis.edu



The following varieties are available from this collection:

- Aqlanico
- Albillo Mayor
- Albillo Real
- Aiden
- Aleatico

5 U.S. Public Collections and 64 Commercial Nurseries

View Nursery

Name: Sunridge Nurseries, Inc.
 Address: 441 Vineland Road
 City: Bakersfield
 State: CA
 Zip: 93307
 Phone: (661) 363-8463
 Fax: (661) 366-4251
 Contact: Steve Maniaci
 Website: <http://www.sunridgenurseries.com>
 Email: Steve@sunridge.net



The following varieties are available from this nursery:

- Alicante Bouschet
- Aligoté
- Arinarnoa
- Autumn Black
- Autumn King
- Autumn Royal
- Barbera

Nursery contact information with available varieties (cross linked)

NATIONAL GRAPE REGISTRY

Main Commercial Public Varieties About Us People Links variety/synonym help

Zinfandel

Prime Name: Zinfandel
 Common Synonym: Crjenak Kastelanski, Primitivo
 All synonyms: Crjenak Kastelanski, Morellone, Primiticcio, Primitivo, Primitivo di Gioia, Uva della Pergola, Uva di Corato, Zenfendel, Zinfindal
 Countries of Origin: Croatia
 Species: *V. vinifera*
 Pedigree: 6- DNA analysis establishes that Zinfandel = Crjenak Kastelanski (Croatia) and Primitivo (Italy)
 TTB Prime Name: Zinfandel
 References: 2 5 8 15 18
 Berry Color: Black
 Uses: Wine

This variety is available at:

- Duarte Nursery, Inc.
- Foundation Plant Services
- Gray Creek Viticultural Services, Inc.
- L.E. Cooke Company
- Lake County Grapevine Nursery
- Mercier California, LLC
- Northwest Grape Foundation Service

645 grape varieties, each with synonyms, references, and identified sources for obtaining nursery stock

Main Commercial Public Varieties About Us People Links variety/synonym help

Variety and Synonym Search

No varieties met your search criteria: **Drz***

The Variety Search function is designed to locate grape variety names which are included on the website either as a listed main variety or as a synonym to a listed variety. The search function will not retrieve grape names listed in parentage or pedigree fields.

When you enter a full and correct word for a variety name in the Variety Search block, the computer will look for all variety names on the website which contain that same word, either in the main variety name or as a synonym to a main variety name. All variety names which contain a direct match will then be displayed on a list. If you simultaneously enter two words for a variety (e.g., Cabernet Sauvignon), the computer will capture and display results for both words on the resulting list.

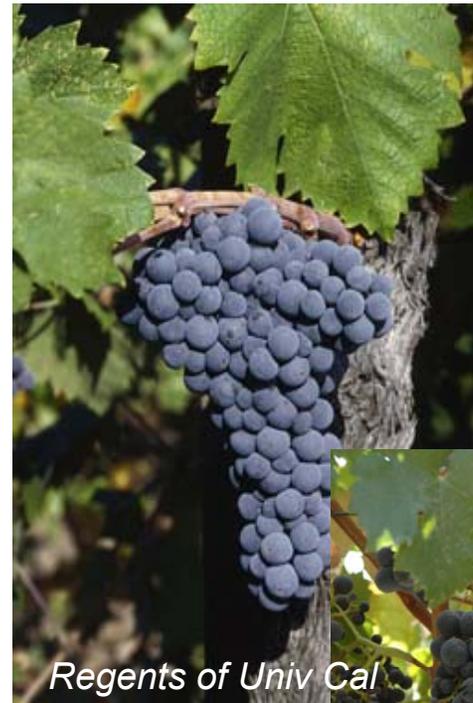
The database was also designed to search on partial names, in the event that the user does not know the full name of a variety or misspells a variety name. The user can search the database and locate main variety names or synonyms for varieties when the full name or correct spelling is unknown.

If you misspell or enter only a few letters of a variety name, the computer will search for the first three (3) letters of the word entered in the Variety Search block. All varieties which contain those first three letters, either in the variety name or as a related synonym name, will then be displayed as possible matches. You may then click on each variety on the resulting list to locate your desired grape. For best results, you should enter at least three letters to locate a desired variety.

User-friendly search for varieties and synonyms

Next steps for 2007-2008

- Expand the database to include clones of the major varieties, their characteristics and availability
- Enter information for thousands of minor varieties which are not on the website
- Recruit additional commercial nurseries from all parts of the United States
- Assist current nursery participants with maintaining and updating their variety lists on the site



Regents of Univ Cal



Photo by Ivan Pejić



Photo by Paul Verdegae

Extending the Work of ARS Scientists to the Wine and Grape Industries

- Making ARS known and relevant
- Dedicated Web Site and/or publication
- Greater interaction with extension personnel
- More ARS outreach
- Publish in trade magazines and journals
- Planned events with industry members
- ARS-Land Grant-Industry advisory groups – formal and informal