



USDA-ARS Grape & Wine Workshop



National Grape and Wine Initiative

Overview

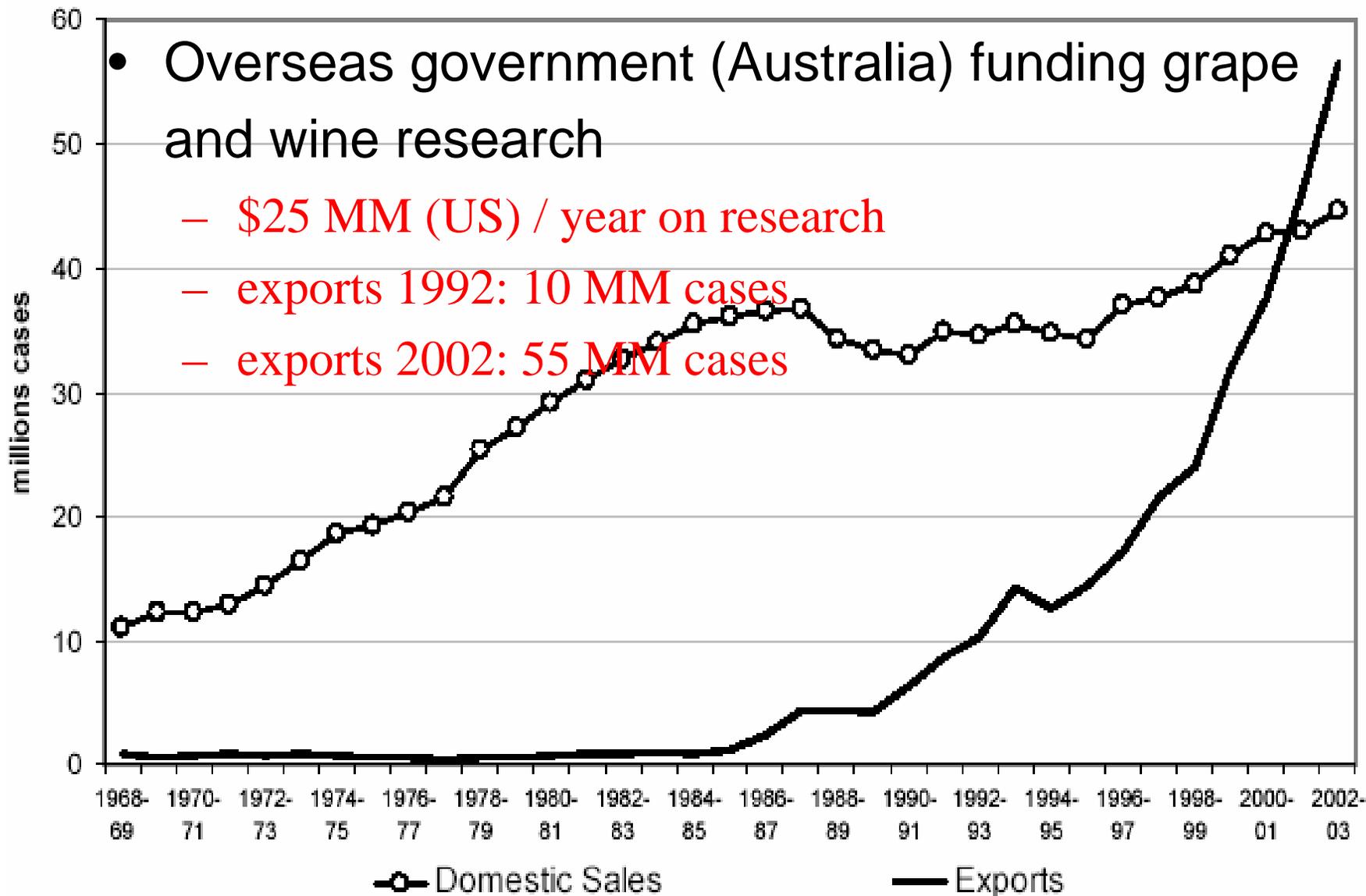


Why NGWI?

- Global Competition
- Growth as a National Industry
- Concerns about Funding for Research and Extension



Look Outside for Models





Challenges to the US Wine Industry

- US grape and wine R&D not competitive due to:
 - a disconnect between industry and researchers
 - severe government cutbacks for extension positions
 - numerous funding organizations, but industry contribution voluntary and uneven
 - many important areas of research insufficiently funded
 - focus on research priorities insufficient



What Could We Do to Better Address These Needs?

- Create a common vision for the grape and wine industry at the national level
- Identify strategic research and extension needs and priorities
- Build a partnership among public and private sectors for sustained investment in research and outreach for the industry

National Grape and Wine Initiative (NGWI)

- A diverse group from industry, academia, and state and federal governments aligned in 2004
- Developing a national plan and infrastructure that will support both regional needs and national objectives for research and outreach





Objectives of NGWI

- Bring together key individuals from the entire national sector to:
 - identify research and extension priorities
 - develop a strategic, focused approach to tackling the most important projects, strengthening accountability and ensuring communication
 - stimulate increased investment from industry
 - seek substantial federal funds in recognition of the importance to the national economy of a thriving grape and grape products industry



The Vision

- By 2020, the American grape and wine industry will triple its economic impact to \$150 billion by strongly increasing market share, becoming the undisputed world leader in value and sustainability, and contributing to the quality of life in our rural communities



Where Are We with the NGWI?

- Several national meetings to build consensus and begin planning
- Strategic plan developed, with 4 top-level strategies:
 - understanding and improving quality
 - consumer insights, nutrition and community issues
 - efficient production and processing practices
 - sustainable production and processing practices
- Detailed action plans are under development for each strategy
- Governance Structure is under development



NGWI Research Priorities

July 2005

USDA-ARS Grape & Wine
Industry Workshop

Quality



<p>1.1 To understand the relationship between the components of grapes and grape products and their sensory quality attributes</p>	<p>1.1.1 Identify and quantify with modern analytical, biotechnological and sensory techniques the components of grapes and grape products that impact key sensory quality attributes.</p>	7 + years	\$5MM/yr for first 5 years	1.1	1.3, 1.4, 1.5,
	<p>1.1.2 Develop and implement standard sampling, analytical and interpretative protocols for monitoring grape development and ripening.</p>	7 + years	\$2MM/yr for 5 yr		
	<p>1.1.3. Develop and implement new analytical, biotechnological and sensory testing methods to improve assessment of grape, grape product quality potential and maturity.</p>	7 + years	\$8mm/yr for 10 yr		
	<p>1.1.4. Develop and implement a national sensory training network. Year 1. Develop for juice and wine; begin development for grapes. Year 2 - implement for juice and wine, complete development for grapes. Year 3. Implement for grapes and begin to link with viticultural and winemaking practices.</p>	7+ years	\$1MM/yr		
	<p>1.1.5. Create a national center (service) for chemical testing of grape and grape products that provides a uniform application of analytical methods, data collection and data management.</p>	7+ years	\$30MM Construction. \$5MM/yr running costs		
	<p>1.1.6 Develop and implement a regional and national traveling extension roadshow and testing lab to transfer "application-ready" technology and testing methodology to end users.</p>	1-3 years	\$1MM start up \$0.5MM/yr		

Quality (cont.)



<p>1.2 To deliver grape and grape products according to specifications.</p>	<p>1.2.1. Develop and maintain a national register of grape scion and rootstock cultivars and clones available in the USA and abroad for evaluation in Program 3.1.2.</p>	1-3 years	\$0.5MM/yr	1.2; 3.2;	1.3; 1.5; 3.2; 5.2
	<p>1.2.2. Index and verify all commercially available scion varieties and rootstock cultivars to provide a national clean stock collection. Provide importation and quarantine processing of international materials of interest.</p>	7-10 years	\$5 to 10 MM/year		
	<p>1.2.3. Establish a National Grapestock system as a genetic resource for future development of vines, importation and disease cleanup. Multiple sites are necessary for local collections as well as replicating international materials.</p>	7+ years	\$1.5 MM startup, \$1.0 MM/year		
	<p>1.2.4. Characterize the quality and yield potential of existing grape materials, and develop new grape materials to meet industry requirements and specifications.</p>	10 years	\$ 1MM for 5 yr		
	<p>1.2.5. Develop and implement methods to define and manage spatial and temporal variation in grape composition in the vineyard to optimize supply uniformity.</p>	4-7 years	\$1MM for 5 yr		
	<p>1.2.6. Characterize the impact of above- and below- ground environmental and cultural variables on grape composition.</p>	7+ years	\$3MM for 10 yr		
	<p>1.2.7. Characterize the impact of biotic and abiotic factors on the sensory quality attributes of grape and grape products .</p>	7+ years	\$3MM for 10 yr		

Consumer



Objectives	Strategies	Timeframes	Cost Estimate	ARS	CSREES
2.1. To understand consumer insights in the development and production of more targeted grape and grape products to secure increased market share and sustainability.	2.1.1. Understand consumer requirements for grape and grape products.	4 - 7 years	\$2 million total over first 3 yr. \$600,000/yr thereafter	4.1	1.1; 1.3; 2.2; 4.1; 1.5
	2.1.2. Relate insights to grape and grape product composition to guide the production of products with required attributes.	4 - 7 years			
	2.1.3. Understand the impact of factors, such as packaging and supply chain conditions, on the shelf life of grape and grape products.	1 - 3 years	\$1.25 million total over first 2 yr. \$500,000/yr thereafter.		
2.2. To promote consumer understanding of nutritional aspects of grapes and grape products.	2.2.1. Determine negative and positive nutritional components of grape and grape products (i.e. raisin and juice).	5 - 7 years	\$2.5 MM over 5 years	4.1	1.3; 2.2; 4.1;
2.3. To characterize and improve the contribution by the grape and grape product industries to the quality of life in rural communities.	2.3.1. Determine the impact and uniqueness of the national/regional grape and grape products industry to local economics, tourism and land use.	1 - 3 years	Total for 1st yr: \$650,000	4.1	1.3; 2.2; 4.1;
	2.3.2. Understand national/regional product affiliation and impact on consumer.	5 - 7 years	Total for 1st 5 yr: \$7.25 million		
	2.3.3. Develop an expert system to optimize selection of vineyard and winery sites.	4 - 7+ years	\$1.5-3 million/yr		

Production Efficiency



Objectives	Strategies	Timeframes	Cost Estimate	ARS	CSREES
3.1. To optimize the interaction of the genotype with the environment.	3.1.1. Develop and define parameters for the evaluation of sites (soil and climate), and integrate them into site selection decision-making.	7 + years	\$0.75MM /yr for 10 yr	1.2; 3.2; 5.2	1.3; 1.5
	3.1.2. Develop and expand scion and rootstock breeding and evaluation programs to increase commercial selections and overcome current limitations using traditional and modern analytical, biotechnological and sensory techniques.	7 + years	10mm/ year for 10 years (given current spending levels)		
3.2. To define, improve and optimize vineyard efficiency.	3.2.1. Develop a definition of production efficiency for vineyards that will enable characterization of regional restraints to efficient grape production.	1 - 3 years	\$0.5MM for 3 yr	1.2; 5.2;	1.4; 1.5; 5.2
	3.2.2. Create, evaluate and adopt economically viable and currently available technologies for small to large vineyards (an extension/educational approach).	4 - 7 years	\$1MM/yr for 3 yr		
	3.2.3. Create, evaluate and adopt precision agricultural technologies for small to large vineyards (a research approach).	4 - 7 + years	\$1MM/yr for 10 yr		
	3.2.4. Explore and apply cutting edge technologies to improve vineyard production efficiency.	7 + years	\$1MM/yr for 10 yr		



Production Efficiency (cont.)

3.3. To optimize vineyard design and management for cost, quality and the environment.	3.3.1. Advance vineyard design and development by improving training trellis system design and selection and optimization of canopy management practices.	7 + years	\$2MM/yr for 10 yr	3.2; 5.2	1.4; 1.5; 3.2; 5.2
	3.3.2. Develop and apply improved yield estimations and crop load management practices.	1 - 3 years	\$1 MM/yr for 5 years		
	3.3.3. Minimize the amount of water needed to produce a ton of grapes by optimizing inputs and irrigation practices for cost, quality and the environment.	1 - 5 years	\$ 1.5 MM/yr for 5 years	1.2, 5.2 3.2	
	3.3.4. Optimize fertilizer inputs and nutrition practices for cost and quality.	7 + years	\$2MM/yr for 10 yr	3.2; 5.2	
	3.3.5. Develop improved monitoring tools for soil physical and chemical properties and plant tissue nutrient content.	4 - 7+ years	\$2MM/yr for 10 yr	1.2, 5.2	1.4; 1.5; 5.2
	3.3.6. Optimize vineyard mechanization.	7 + years	\$2MM/yr for 10 yr	3.2; 5.2	1.4; 1.5; 3.2; 5.2
	3.3.7. Enhance knowledge of vine and pest/pathogen interactions and develop systems to optimize management practices.	7 + years	10 MM/ for 10 years (give current spending levels)		



Production Efficiency (cont.)

3.4. To optimize the efficiency of grape processing facilities for cost, quality and the environment.	3.4.1. Optimize the microflora of grape and wine processing to reduce negative effects and enhance desired effects.	4 - 7 years	\$5MM/yr for 10 yr	1.1; 1.2; 5.2;	1.3; 1.4; 5.2
	3.4.2. Implement current best practice and develop innovative processes to improve cleaning and sanitation procedures for grape and grape product processing facilities.	1-3 years	\$0.5 MM/yr for 3 years		
	3.4.3 Develop and extend HACCP management tools for grape processing facilities.	4 - 7 years	\$2 MM/yr		
	3.4.4 Develop and apply objective measures to optimize (ie analytical and statistical) performance of grape and grape product processing.	5 - 7 years	\$2 MM/yr		
	3.4.5 Implement current best practice and develop innovative strategies to control and optimize grape and grape product processing through application of new equipment, sensors, instrumentation and procedures.	5 - 7 years	\$2 MM/yr		

Sustainability



Objectives	Strategies	Timeframes	Cost Estimate	ARS	CSREES
4.1. To manage in a sustainable manner the waste streams of grape and grape product processing/packaging facilities.	4.1.1. Develop research and extension strategies to eliminate or minimize off-site movement of water from vineyards. If water does leave the vineyard develop strategies for ensuring water quality is high after leaving the vineyard.	1 - 5 years	\$ 1.5 MM/yr for 5 years	1.2; 5.2;	1.4; 1.5; 5.2
	4.1.2. Develop improved research and extension strategies for the management of wastewater from grape processing operations.	1 - 5 years			
	4.1.3. Apply current best practice for most cost effective strategies for the capture, control, elimination and recycling of air emissions from grape and grape product processing/packaging operations.	1 - 5 years			
	4.1.4. Develop strategies to improve ground water recharge.	4 - 7 + years	\$1 MM/yr for first 4 years		
	4.1.5. Develop and apply separation systems to the grape products industry to reduce cost, reduce waste, recover byproducts of value and increase quality.	1 - 5 years	\$4-5 MM/yr, for first 3 years	1.1; 1.2; 5.2	1.3; 1.4; 5.2
	4.1.6. Promote the reduction of water and energy usage through current best practice and development of new practices.	1 - 3 years	\$2MM/yr for 3 yr for profiling work. \$1MM/yr for research and extension	1.2; 1.2; 5.2;	1.3; 1.4; 5.2
	4.1.7. Develop research and extension strategies for addressing salt, BOD, water usage and total nitrogen load in vineyards and grape processing operation.	1 - 3 years	3 to 5 MM/year given current spending.	1.1; 1.2; 5.2	1.3; 1.4; 5.2



Sustainability (cont.)

<p>4.2. To manage in a sustainable manner the nutrient/mineral cycle and soil health and quality in the vineyard.</p>	<p>4.2.1. Develop improved understanding of how vineyard floor management, such as tillage, cover cropping and weed management, affects soil health (physical and biological properties), yield and fruit quality attributes.</p>	4 - 7 + years	\$2MM/yr for 10 yr	1.2; 5.2	1.4; 1.5; 5.2
	<p>4.2.2. Develop strategies for reducing offsite movement of soil either in the air or in water.</p>	4 - 7+ years			
	<p>4.2.3. Develop an improved understanding of what is soil quality and how to characterize it.</p>	4 - 7 + years			
	<p>4.2.4. Develop an improved understanding of the effects of synthetic and biologically derived nutrient inputs on soil quality, vine health, yield and fruit quality attributes.</p>	7 + years			
	<p>4.2.5. Develop an improved understanding of the role of soil microbes and soil microbial biodiversity in soil health and quality, vine health, yield and fruit quality attributes.</p>	7 + years			



Priority List

- 7 Projects selected for focused discussion and dialogue with funding agencies.
- Selection based on industry feedback
- Representation from all 4 buckets:
 - Quality, Consumer, Production Efficiency and Sustainability
- Projects include short (1-3 years), medium (4-6 years) and long-term (7+ years)
- Projects include R&D, and Extension components



Funding Priorities

Focus Area	Objectives	Strategies	Timeframes	Cost Estimate	USDA
1. Quality	(I) 1.1 To understand the relationship between the components of grapes and grape products and their sensory quality attributes.	1.1.1 Identify and quantify with modern analytical and sensory techniques the components of grapes and grape products that impact key sensory quality attributes.	7+ years	\$5MM/yr for first 5 years	1.1
	(II) <u>Project Group (1.2 & 3.1)</u> : Provide a national resource of disease- and pathogen-free grape stock, evaluated for regional influences on viticultural suitability and product quality attributes.	1.2.2. Index and verify all commercial available scion varieties and rootstock cultivars to provide a national clean stock collection. Provide importation and quarantine processing of international materials of interest.	7 to 10+ years	\$5 to 10 MM/year	1.2; 3.2
		3.1.2. Develop and expand scion and rootstock breeding and evaluation programs to increase commercial selections and overcome current limitations using traditional and modern analytical, biotechnological and sensory techniques.	7+ years	\$10/yr for 10 yr (given current spending levels)	1.2; 3.2; 5.2
		1.2.1. Develop and maintain a national register of grape scion and rootstock cultivars and clones available in the USA and abroad for evaluation in Program 3.1.2.	1-3 years	\$0.5MM/yr	1.2; 3.2;



Funding Priorities (cont.)

2. Consumer	(III) 2.1. To understand consumer insights in the development and production of more targeted grape and grape products to secure increased market share and sustainability.	2.1.3. Understand the impact of factors, such as packaging and supply chain conditions, on the shelf life of grape and grape products.	1 to 3 years	\$1.25 million total over first 2 yr. \$500,000/yr thereafter.	4.1
	(IV) 2.2 To promote consumer understanding of nutritional aspects of grapes and grape products.	2.2.1 Determine the negative and positive nutritional components of grape and grape products (i.e. raisin and juice)	5-7 years	\$2.4 MM over 5 years	4.1
	(V) 2.3 To characterize and improve the contribution by the grape and grape product industries to the quality of life in rural communities.	2.3.1. Determine the impact and uniqueness of the national/regional grape and grape products industry to local economics, tourism and land use.	1 to 3 years	Total for 1st year: \$650,000	4.1



Funding Priorities (cont.)

3. Production & Process Efficiency	(VI) <u>Project Group (3.2 & 3.3)</u> Advance vineyard management and efficiency	3.2.1. Develop a definition of production efficiency for vineyards that will enable characterization of regional restraints to efficient grape production.	1 to 3 years	\$0.5MM for 3 years	1.2;5.2
		3.3.2 Develop and apply improved yield estimations and crop load management practices.	1 to 3 years	\$1 MM/yr for 5 years	3.2; 5.2
		3.3.7. Enhance knowledge of vine and pest/pathogen interactions and develop systems to optimize management practices.	7 + years	\$10/year for 10 years (given current spending)	3.2; 5.2



Funding Priorities (cont.)

4. Sustainability	(VII) <u>Project Group (3.4 & 4.1)</u> : Develop and implement grape processor best practices in sanitation, resource and waste stream management for enhanced environmental performance	3.4.2. Implement current best practice and develop innovative processes to improve cleaning and sanitation procedures for grape and grape product processing facilities.	1 to 3 years	\$0.5 MM/yr for 3 years	1.1; 1.2; 5.2
		4.1.6. Promote the reduction of water and energy usage through current best practice and development of new practices.	1 to 3 years	2 MM/yr for 3 years for profiling work. \$1MM/yr for research and extension	1.1; 1.2; 5.2
		4.1.7. Develop research and extension strategies for addressing salt, BOD, water usage and total nitrogen load in vineyards and grape processing operation.	1 to 3 years	\$3 to 5 MM /yr for 3 years	1.2; 5.2;



Update Today

- **NGWI**—Governance Progress; Action plans to be finalized in 2005
- **Grape and Wine Research/Extension**—Strategy communicated widely to all relevant parties
- **Industry Funds**—Initiated seeking an increase of national industry dollars for research and extension, based on action plans
- **Government Funds**—Invited government agencies to augment the pool of funds for research and extension activities
- **ARS**—Initiated increased alignment with ongoing governmental research bodies