

Management of Genetic Resources for Vitis, Prunus, Juglans, Ficus, Olea, Pistacia, Punica, Diospyros, Actinidia, and Morus

ARS LOCATION:

National Clonal Germplasm Repository
One Shields Avenue
University of California
Davis, CA 95616-8607

PRINCIPAL INVESTIGATOR:

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PROJECT OBJECTIVES:

1. Strategically expand the genetic diversity in genebank collections and improve associated information.
2. Conserve and regenerate efficiently and effectively, and distribute disease-free samples (whenever feasible) and associated information worldwide.
3. Strategically characterize (“genotype”) and evaluate (“phenotype”) using molecular markers and key horticultural traits such as adaptation and product quality.

MAJOR ACCOMPLISHMENTS (2009 – 2010):

Expand Genetic Diversity:

During a plant collection trip to Azerbaijan in 2009, Dr. Malli Aradhya collected 14 accessions of *V. vinifera*, and four accessions of *V. vinifera* ssp. *Sylvestris*.

Conserve, Regenerate, and Distribute:

A study on the effects of chilling of dormant cuttings on rooting of 10 *Vitis* genotypes is nearing completion. Chilling has little effect on *V. vinefera*, but may be stimulatory to other species of grapes.

Characterize genotypes and phenotypes:

Phylogeography of the genus *Vitis* – The genotypic data across 340 accessions representing 57 taxa of *Vitis* and related genera for 18 microsatellite loci has been analyzed to decipher genetic diversity, structure and differentiation within and among taxa and taxonomic series to understand the evolutionary relationships among taxa using population genetic approaches. The results are being written up into a manuscript and due to be submitted to a peer reviewed journal soon.

Origin and domestication history of cultivated grape (*Vitis vinifera*) – This project involves extensive genotyping of cultivated grape and its progenitor, *V. v.* ssp. *sylvestris* from Europe, the Caucasus and West Asia to elucidate the roles of introgression and *in situ* hybridization in the origin and domestication of cultivated grape.

The Davis repository uploaded 11,229 phenotypic data points and is in the process of uploading 3,500 photographs depicting the phenotypic traits of grapes.

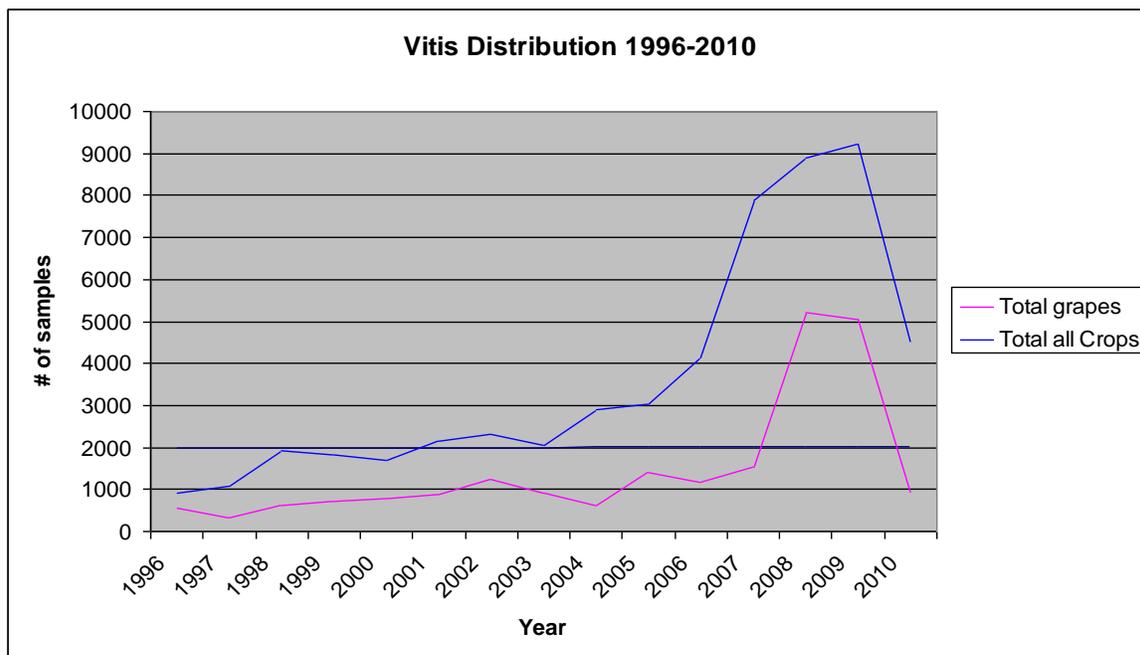
TECHNOLOGY TRANSFER/OUTREACH:

Worldwide distribution of grapes from the Davis Repository from 1996-2010.

	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10*
Azerbaijan															1
Brazil	7					8									
Canada										8	6	5	1	364	
China				29	17	53	34		9		22	32			
Denmark					9	17									
France												7		14	
India					9							22			
Israel						1									
Italy							9		3	1					1
Japan	4				7	1				1					
Georgia													40		
Germany					24	62			4	23	16				
Korea														14	
Morocco										1					
Pakistan				16											
Russia	188			73		83		74							
Slovak Republic											10				
South Africa	7	7							18						
Spain						1	155								
Sudan										22					
Total World Grape	1067	0	118	66	226	198	74	34	48	57	67	41	392	2	
USA Grapes	345	319	609	587	704	640	1029	853	584	1341	1114	1457	5170	4637	925
Total grapes	551	326	609	705	770	866	1227	927	618	1389	1171	1524	5211	5050	927
Total all Crops	902	1089	1906	1837	1681	2166	2314	2047	2912	3040	4123	7873	8904	9215	4493

*2010 numbers are for 2010 to date

Number of Grape samples Distributed by the Davis Repository from 1996-2010



EXTERNAL SUPPORT: N/A

COLLABORATORS:

Deborah Golino and Jerry Dangl, Foundation Plant Service, University of California, Davis, CA; Peter Cousins and Christopher Owens, ARS Geneva, NY; Steven Lund, University of British Columbia, Vancouver, BC, Canada; and Edward Buckler, ARS Ithaca, NY.

RECENT PUBLICATIONS:

- Stover, E., Aradhya, M., Yang, J., Bautista, J. and Dangl, B. 2009. Investigations into the origin of 'Norton' grape using SSR markers. *Proc. Fla. State Hort. Sci.*, 122: 1 -6.
- Muganu, M., Dangl, G., Aradhya, M., Frediani, M., Scossa, A. and Stover, E. 2009. Ampelographic and DNA Characterization of Local Grapevine Accessions of the Tuscia Area (Latium, Italy) *Am. J. Enol. Vitic.*, 60: 110 - 115.
- Stover, E., M. Aradhya, J. Dangl, B. Prins, and P. Cousins. 2009. Grape genetic resources and research at the Davis, California National Clonal Germplasm Repository. *Acta Hort.* 827-193-196.
- Dangl, G.S., R. Raiche, S. Sim, J. Yang and D.A. Golino. 2010. The genetic composition of 'Roger's Red', an important ornamental grape. *Am. J. Enol. Vitic.* 61(2):266-271