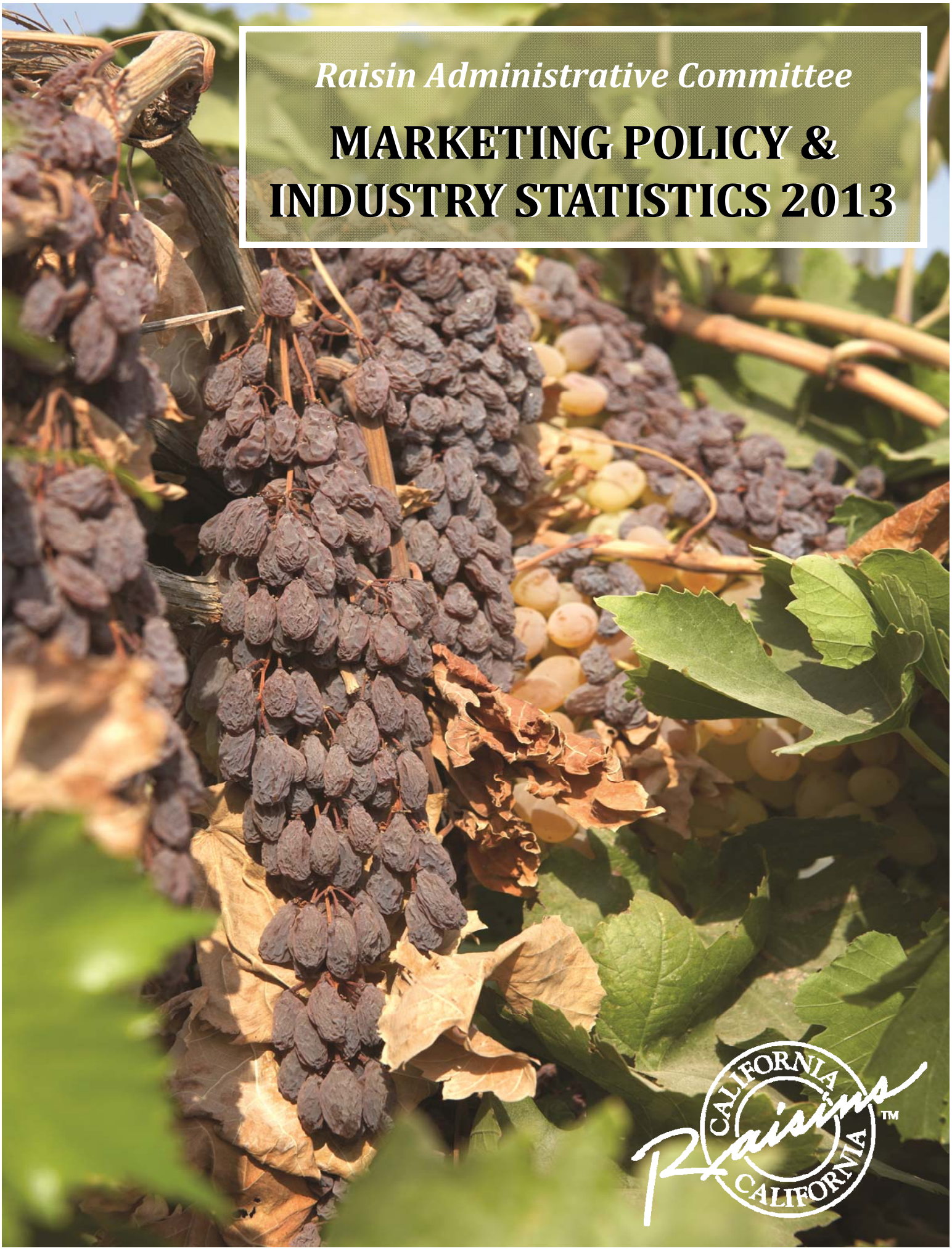
Raisin Administrative Committee
MARKETING POLICY &
INDUSTRY STATISTICS 2013
CALIFORNIA
Raisins
CALIFORNIA
™

Raisin Administrative Committee

Marketing Policy & Industry Statistics
2013 – 2014 Marketing Season

As Presented and Approved by the RAC on October 24, 2013
and Submitted to the Secretary.

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From Federal Marketing Order 989.54(e) Factors. When computing preliminary and interim percentages, or determining final percentages for recommendation to the Secretary, the Committee shall give consideration to the following factors:

(1) THE ESTIMATED TONNAGE HELD AT THE BEGINNING OF THE CROP YEAR.

(A) Tonnage held by producers.

0 tons were being held on Memorandum Storage as of July 31, 2013.

(B) Tonnage held by handlers.

Packer inventory of raisins as of July 31, 2013, with comparative tonnages for July 31, 2012 was as follows:

	PACKER INVENTORY * as of 07/31/12 Held Locally	***PACKER INVENTORY * as of 07/31/13 Held Locally***
Natural Seedless	**132,061**	**132,407**
Dipped Seedless	**1,713**	**1,576**
Golden Seedless	**6,684**	**4,917**
Zante Currant	**2,625**	**2,353**
Sultana	**47**	**26**
Muscat	**23**	**0**
Monukka	**171**	**179**
Other Seedless	**3,911**	**4,107**
Other Seedless Sulfured	**609**	**620**
TOTAL	**147,844**	**146,185**

** Includes packed and unpacked in sweatbox tons*

10 Year Natural Seedless Carry-in Inventory (Free Tonnage & Unreleased Reserve)

	Free Tonnage	Unreleased Reserve	Total
2004-05	95,003	101,358	196,361
2005-06	114,792	26,257	141,049
2006-07	111,444	49,486	160,930
2007-08	105,430	20,864	126,294
2008-09	106,249	647	106,896
2009-10	126,824	12,154	138,978
2010-11	83,143	71	83,214
2011-12	110,206	2	110,208
2012-13	132,061	0	132,061
2013-14	132,407	0	132,407
10 Year Average	***111,756***	***21,084***	***132,840***

(C) Estimated tonnage held by Committee as of August 1, 2013.

The Committee held 0 tons of Natural Seedless reserve pool raisins.

(2) THE EXPECTED GENERAL QUALITY AND ANY MODIFICATIONS OF THE MINIMUM GRADE STANDARDS.

(A) The 2013 harvest was 7 to 10 days early.

(B) During the 2012-13 crop year, incoming substandard and quality standards were maintained at the standard level. Substandard dockage has a maximum limit of 17% and B or Better maturity dockage allowance has a minimum limit of 35%.

(C) Although raisins produced from grapes grown outside of the State of California are not subject to volume regulations or grade and condition standards established under the marketing order, the surveillance and reporting provisions for any such raisins received by raisin handlers will continue for the 2013-2014 crop year. Arizona declared fruit must be validated as produced in Arizona or will be subjected to all requirements of California grown fruit.

(3) THE ESTIMATED TONNAGE OF STANDARD AND OFF-GRADE RAISINS WHICH WILL BE PRODUCED.

(A) The Committee met on August 15, 2013 and recognized the computed Trade Demand for Natural (sun-dried) Seedless and all other varietal types (see chart on page 8). The Committee voted to not establish volume regulations, thereby declaring Natural (sun-dried) Seedless and all other varietal types 100% Free. This resulted in no trade demands or volume regulations for the 2013/14 crop year.

Varietal Type	Estimated Production
Natural Seedless + **	348,437
Dipped Seedless**	3,750
Golden Seedless**	19,487
Zante Currant**	3,038
Sultana**	63
Muscat**	2
Monukka**	175
Other Seedless**	8,515
Other Seedless Sulf.**	490

+ Beginning with the 2003-04 Crop Year, the Natural Seedless varietal type was modified through informal rule making to include Oleate Seedless (68 FR 42943: July 21, 2003).

** The Committee computed but did not accept a Trade Demand for all varietal types of raisins resulting in them being 100% free for the crop year 2013-14.

The 2013 August 1 grape estimate and the 2012 and 2011 final grape crops (in green tons) are as follows:

Varietal Type	***2013 est.***	Final 2012	2011
Wine	TBD	3,740,000	3,387,000
Table	TBD	987,000	1,031,000
Raisin	2,400,000	1,951,000	2,194,000
Total	TBD	6,678,000	6,612,000

Source: USDA California Fruit & Nut Review, September 2013
TBD: To be determined

(B) Estimate of Tunnel Dehydrated Raisin Production.

Production of Golden Seedless raisins in the 2012-2013 crop year was 17,340 swb tons. The carry-over from that year was 4,917 tons. Dipped Seedless production in 2012-2013 was 3,644 tons with a carry-over of 1,576 tons. The Committee will determine a 2013-14 crop estimate for Golden Seedless and Dipped Seedless raisins. (See chart above)

(C) Estimated Tonnage of Off Grade Raisins to be Produced.

The 2013 growing season was favorable resulting in an early harvest.

(4) THE ESTIMATED TRADE DEMAND FOR RAISINS IN FREE TONNAGE OUTLETS.

(A) The tonnage of raisins marketed in recent crop years in domestic and Canadian markets, including government purchases, on a packed tonnage basis is shown in the following table:

Domestic & Canadian Markets Packed Tons					
Varietal Type	2008-09	2009-10	2010-11	2011-12	***2012-13***
Natural Seedless	191,929	186,176	180,344	183,703	184,417
Dipped Seedless	3,480	3,629	4,803	1,618	2,847
Golden Seedless	11,539	11,699	12,614	11,986	12,486
Zante Currants	1,536	1,382	1,090	1,205	1,501
Sultanas	56	52	37	58	57
Muscats	2	0	2	0	0
Monukkas	347	126	101	142	71
Other Seedless	4,363	5,385	7,237	5,750	7,114
Other Seedless Sulf.	406	422	396	450	328
Total	213,658	208,871	206,624	204,912	208,821
Five-Yr. Average					208,577

(B) Free tonnage marketed in foreign markets during the past five years:

Export Markets Packed Tons					
Varietal Type	2008-09	2009-10	2010-11	2011-12	***2012-13***
Natural Seedless	125,789	152,246	129,198	119,373	108,816
Dipped Seedless	0	19	30	158	522
Golden Seedless	5,217	4,858	5,848	5,206	4,915
Zante Currants	1,771	781	1,003	905	1,231
Sultanas	0	0	0	0	0
Muscats	0	0	0	0	0
Monukkas	1	0	0	0	0
Other Seedless	760	1097	1,144	2,434	1,409
Other Seedless Sulf.	0	21	144	105	62
Total	133,538	159,022	137,367	128,181	116,955
Five-Yr. Average					135,013

(5) AN ESTIMATED DESIRABLE CARRYOUT AT THE END OF THE CROP YEAR FOR FREE TONNAGE AND, IF APPLICABLE, FOR RESERVE TONNAGE.

Free Tonnage – The Committee's unanimous recommendation on February 23, 2011 was approved by USDA to change the desirable carryout from 60,000 tons to 85,000 tons, for Natural (sun-dried) Seedless raisins. The desirable carry-out calculation for other varietal types remained at a rolling average of 2.5-months of prior year's shipments over the past five years, dropping the high and low figure. (The rule was published in the Federal Register on July 18, 2011.)

(6) THE ESTIMATED MARKET REQUIREMENTS FOR RAISINS OUTSIDE FREE TONNAGE OUTLETS, CONSIDERING THE ESTIMATED WORLD RAISIN SUPPLY AND DEMAND SITUATION.

The export and the domestic demand is supplied from free tonnage raisins. The export of California Natural Seedless raisins decreased by 10,557 packed tons to 108,816 packed tons during 2012-2013 from 119,373 packed tons in 2011-12.

The following table shows the shipments of raisins on a packed weight basis for the 2012-2013 crop year.

Countries of Destination	Natural Seedless	Golden Seedless	Other
Australia	3,199	84	549
Belgium	377	15	0
China*	9,006	6	390
Denmark	2,928	0	0
Finland	1,649	0	0
France	164	0	0
Germany	11,099	53	14
Hong Kong	1,600	106	30
Indonesia	1,531	14	64
Israel	388	1,432	50
Japan	19,450	0	1,032
Malaysia	3,557	745	287
Mexico	3,131	30	27
Netherlands	3,337	0	0
New Zealand	1,753	76	25
Norway	3,146	0	0
Philippines	2,380	6	9
Singapore	1,562	240	47
Ireland	344	0	0
South Korea	4,551	22	18
Sweden	6,532	0	9
Taiwan	4,476	246	46
Thailand	2,024	131	35
United Kingdom	11,999	142	176
Russia	64	438	304
Latin America	3,698	10	107
All Other Markets	4,871	1,119	5
TOTAL	108,816	4,915	3,224

*Historically a large volume of China exports are transshipped directly to Japan.

The RAC was represented at the International Conference of Dried Grape Producing Countries in Hamburg, Germany on October 10 & 11, 2013.

(7) CURRENT PRICES BEING RECEIVED AND THE PROBABLE GENERAL LEVEL OF PRICES TO BE RECEIVED FOR RAISINS BY PRODUCERS AND HANDLERS.

(A) Negotiations between packers and the RBA are being held pursuant to the terms of their contract.

Probable Prices to be Received by Producers for the 2013-2014 Crop

Natural Seedless	$	n/a	*Per Ton*
Dipped Seedless	$	n/a	*Per Ton*
Golden Seedless	$	n/a	*Per Ton*
Zante Currants	$	n/a	*Per Ton*
Sultanas	$	n/a	*Per Ton*
Muscats	$	n/a	*Per Ton*
Monukkas	$	n/a	*Per Ton*
Other Seedless	$	n/a	*Per Ton*
Other Seedless Sulf.	$	n/a	*Per Ton*

(B) Current Prices Being Quoted by Handlers as of September, FOB

Natural Seedless	$	n/a	*Per Ton*
Dipped Seedless	$	n/a	*Per Ton*
Golden Seedless	$	n/a	*Per Ton*
Zante Currants	$	n/a	*Per Ton*
Other Seedless	$	n/a	*Per Ton*

(8) THE TREND AND LEVEL OF CONSUMER INCOME.

Although monetary and fiscal policies have always helped shape the future character of the economy and the financial markets, they are not the only factors which matter, and frequently, are not even the most important.

Traditional economic policies are turning more restrictive and will likely remain a contrationary force during the rest of this recovery. However, despite policy officials starting to lean against the wind, there are still plenty of positive forces likely to boost economic activity and support the stock market as we look toward 2014 and beyond. Some should be of more immediate help (e.g., rising confidence, a more synchronized global recovery, a steeper yield curve, strong homebuyer affordability, and low inflation) while others may provide a backdrop of support for the next several years (e.g., rising monetary velocity, much improved balance sheets, excess cash reserves, strong and long postponed pent-up demands, a record-low real U.S. dollar, and potentially a massive energy independence dividend).

Due to these many expansionary forces, and despite conventional policies becoming less accommodating, we expect real GDP growth to rise and sustain next year above 3%. Most exciting, this economic performance may drive confidence higher into stage 3 where we may finally enjoy some "real animal economic and market spirits"!

Source: Wells Capital Management Economic and Market Perspective Update; September 13, 2013. Written by: James W. Paulsen, PhD.

Historically, California raisins maintain good market demand even in weaker economic times.

(9) ANY OTHER PERTINENT FACTORS BEARING ON THE MARKETING OF SUCH RAISINS INCLUDING THE ESTIMATED SUPPLY AND DEMAND FOR OTHER VARIETAL TYPES AND REGULATIONS APPLICABLE THERETO.

Calculated Trade Demand

Raisin Administrative Committee

2013-2014

	Natural Seedless	Dipped Seedless	Golden Seedless	Zante Currants	Sultanas	Muscats	Monukkas	Other Seedless	Other Sulf. Seedless
Base Shipments (Packed Tons)	293,233	3,369	17,402	2,732	57	0	71	8,523	390
./. Shrink Factor (5 yr avg)	0.94688	0.91219	0.90446	0.84861	0.77364	(1.38885)	0.89137	0.83994	1.09640
Shrink %	5.312	8.781	9.554	15.139	22.636	238.885	10.863	16.006	(9.640)
= Base Tonnage (Sweatbox Tons)	309,683	3,693	19,240	3,219	74	0	80	10,147	356
x 90% Formula	90%	90%	90%	90%	90%	90%	90%	90%	90%
= Adjusted Base	278,715	3,324	17,316	2,897	66	0	72	9,132	320
Physical Inventory 07/31/13	132,407	1,576	4,917	2,353	26	0	179	4,107	620
- Desirable Inventory	85,000	816	3,868	686	5	0	24	1,700	71
= ± Inventory Adjustment	(47,407)	(760)	(1,049)	(1,667)	(21)	0	(155)	(2,407)	(549)
= Computed Trade Demand	231,308	2,564	16,267	1,230	45	0	(83)	6,725	(228)
2012/13 Final Trade Demand	**N O T R A D E D E M A N D E S T A B L I S H E D**								

NOTE: Prior Years' Practice sets 500 minimum

2012/2013 Shrink for Natural Seedless Raisins is 5.4027%.

General Information: Shrink

In the processing of raisins, a shrinkage occurs. Annually, the "shrinkage" varies due to growing conditions. Shrinkage is computed by determining the disappearance between the total available natural condition supply and the quantity reported as processed. This "Shrinkage" or loss is reflected as a conversion factor throughout this report to account for the difference between natural condition "sweatbox" and processed "packed" weights.

The table on this page shows the annual conversion factors used to convert packed tonnage figures to a sweatbox basis.

Conversion Factors are applied to reported packed weight to determine the sweatbox equivalent. Packed tons are divided by the conversion factor to obtain the equivalent sweatbox weight.

Conversion of sweatbox weight to a packed weight basis is accomplished by multiplying the sweatbox weight by the conversion factor.

	08-09	09-10	10-11	11-12	12-13
Natural Seedless	0.956	0.955	0.943	0.934	0.946
Dipped Seedless	1.090	0.827	0.890	0.862	0.891
Golden Seedless	0.895	0.926	0.897	0.893	0.912
Zante Currants	0.860	0.873	0.834	0.832	0.845
Sultanas	0.728	0.626	0.647	0.969	0.898
Muscats	0.124	-9.089	1.000	1.000	0.021
Monukkas	0.922	0.821	0.930	1.124	0.660
Other Seedless	0.807	0.802	0.772	0.915	0.904
Other Seedless Sulf.	1.599	0.913	0.867	1.047	1.056

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Part IV – Members, Alternates and Staff

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Part V – Misc. California Raisin Research Projects

Table 1

California Bearing Grape Acreage
By Varietal Type, Production and Yield Per Acre

Year	BEARING ACREAGE Total	Wine	Table	Raisins	Fresh Grape Production (tons)	Yield Per Acre (tons)
2004	800,000	473,000	83,000	244,000	5,700,000	7.13
2005	800,000	477,000	83,000	240,000	6,978,000	8.72
2006	797,000	480,000	83,000	234,000	5,726,000	7.18
2007	789,000	480,000	82,000	227,000	6,230,000	7.90
2008	786,000	482,000	83,000	221,000	6,532,000	8.31
2009	789,000	489,000	84,000	216,000	6,548,000	8.30
2010	789,000	489,000	84,000	209,076	6,544,000	8.29
2011	792,000	497,000	85,000	210,000	6,700,000	8.46
2012	796,000	506,000	85,000	205,000	6,488,000	8.15
2013	793,000	508,000	85,000	200,000	6,678,000	8.42
TEN YEAR AVERAGE	793,100	488,100	83,700	220,608	6,412,400	8.09

Source: Agricultural Statistics Board NASS, USDA - March 2013

The total production of grapes in California continues to be influenced more by the change in production per acre than by any change in bearing acreage. The ten year average grape production per acre was 5.2 tons - 1940-49; 6.2 tons - 1950-59; 7.1 tons - 1960-69; 7.0 tons - 1970-79; 7.92 tons - 1980-89 and 8.02 tons for the ten years 1990-99. The increased production per acre has been significant in the increase in total grape production. The 10 year average bearing acreage for 1940-49 was 501,785 acres, the 10 year average for 1980-89 was 643,329 acres and 673,270 acres for the ten years 1990-99.

Table 1A

California Non-Bearing Grape Acreage
By Varietal Type

	NON-BEARING ACREAGE			
Year	Total	Wine	Table	Raisins
2003	43,884	34,913	5,905	3,066
2004	36,069	26,639	6,626	2,804
2005	38,281	25,856	7,531	4,894
2006	39,977	27,280	8,268	4,429
2007	59,000	43,000	10,000	6,000
2008	58,000	44,000	10,000	4,000
2009	54,000	42,000	9,000	3,000
2010	50,000	38,000	9,000	3,000
2011	52,000	37,000	11,000	4,000
2012	54,000	38,000	13,000	3,000
TEN YEAR AVERAGE	48,521	35,669	9,033	3,819

Source: Agricultural Statistics Board NASS, USDA - March 2013

Table 2

California Total Annual Grape Production
By Varietal Type and Utilization
2008-2012
(Fresh Tons)

Varietal Type	2008-2009 Crop		*2009-2010 Crop*		2010-2011 Crop		2011-2012 Crop		*2012-2013 Crop*	
	Tons	%	*Tons*	*%*	*Tons*	*%*	*Tons*	*%*	*Tons*	*%*
Raisins										
Dried	1,838,000	72.94	1,463,000	75.92	1,665,000	80.09	1,541,000	75.06	1,508,000	77.10
Crushed	494,000	19.60	307,000	15.93	274,000	13.18	373,000	18.17	300,000	15.34
Canned	25,000	0.99	20,000	1.04	25,000	1.20	25,000	1.22	25,000	1.28
Fresh Sales	163,000	6.47	137,000	7.11	115,000	5.53	114,000	5.55	123,000	6.29
Total Production	2,520,000	38.49	1,927,000	29.45	2,079,000	30.96	2,053,000	31.64	1,956,000	29.27
Wine										
Crushed	3,015,000	98.69	3,703,000	98.93	3,589,000	98.90	3,343,000	98.82	3,700,000	98.93
Fresh Sales	40,000	1.31	40,000	1.07	40,000	1.10	40,000	1.18	40,000	1.07
Total Production	3,055,000	46.66	3,743,000	57.20	3,629,000	54.04	3,383,000	52.14	3,740,000	55.96
Table										
Dried	35,000	3.60	34,000	3.89	55,000	5.46	55,000	5.04	56,000	5.67
Crushed	165,000	16.96	85,000	9.73	124,000	12.30	210,000	19.23	100,000	10.13
Fresh Sales	773,000	79.45	755,000	86.38	829,000	82.24	827,000	75.73	831,000	84.19
Total Production	973,000	14.86	874,000	13.36	1,008,000	15.01	1,092,000	16.83	987,000	14.77
Total Grape										
Dried	1,873,000	28.60	1,497,000	22.88	1,720,000	25.61	1,596,000	24.60	1,564,000	23.40
Crushed	3,674,000	56.11	4,095,000	62.58	3,987,000	59.37	3,926,000	60.51	4,100,000	61.35
Canned	25,000	0.38	20,000	0.31	25,000	0.37	25,000	0.39	25,000	0.37
Fresh Sales	976,000	14.91	932,000	14.24	984,000	14.65	941,000	14.50	994,000	14.87
Total Production	6,548,000	100.00	6,544,000	100.00	6,716,000	100.00	6,488,000	100.00	6,683,000	100.00

Percentages in Relation to Total Annual Production and Type of Production

Source: Agricultural Statistics Board NASS, USDA, Noncitrus Fruits and Nuts - January 2013. Percentages computed by the RAC.

Table 3

Raisin Deliveries By Varietal Types
2003-2012
(Sweatbox Tons)

Varietal Type	2003-04		2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	*2012-13*
Natural Seedless	296,864	*(a)*	265,262	319,126	282,999	329,288	364,268	298,532	354,878	346,132	311,090
Dipped Seedless	11,933		5,839	8,044	2,456	3,225	4,845	3,827	4,440	2,352	3,644
Golden Seedless	15,650		19,353	15,474	13,833	17,626	19,782	17,008	21,827	21,960	17,340
Zante Currants	3,029		3,495	3,800	2,968	3,347	2,912	2,708	3,468	3,167	2,976
Sultanas	84		34	75	216	93	67	63	66	76	68
Muscat	20		0	2	7	3	5	8	5	3	0
Monukka	336		235	156	364	280	287	155	140	130	111
Other Seedless	2,593		2,649	8,353	5,170	5,231	6,529	7,304	11,351	9,035	9,655
Other Seedless, Sulf.	1,309		374	412	963	687	521	413	808	471	381
TOTALS	331,818		297,241	355,442	308,976	359,780	399,217	330,018	396,983	383,326	345,265

(a) Includes 15,299 tons of Raisin Diversion Tonnage

RAC - September 2013

Table 3A

Top 20 Destinations for Crop Year 2012-2013
Natural Seedless
(Packed Tons)

YTD Rank	Destination	YTD Tonnage 8/01/12-7/31/13	Previous YTD tonnage 8/01/11-7/31/12
1	United States	175,204	174,381
2	Japan	19,450	18,727
3	United Kingdom	11,999	13,282
4	Germany	11,099	10,788
5	Canada	9,213	9,322
6	China	9,006	11,949
7	Sweden	6,532	7,033
8	South Korea	4,551	3,730
9	Taiwan	4,476	4,007
10	Malaysia	3,557	3,563
11	Netherlands	3,337	3,608
12	Australia	3,199	8,511
13	Norway	3,146	3,305
14	Mexico	3,131	4,015
15	Denmark	2,928	3,504
16	Philippines	2,380	2,311
17	Thailand	2,024	2,123
18	New Zealand	1,753	1,652
19	Finland	1,649	1,726
20	Hong Kong	1,600	1,642

*Historically a large volume of China exports are transshipped directly to Japan.

RAC - September 2013

Table 4

Free Tonnage Shipments By Country of Destination
Natural Seedless Raisins
August 1 - July 31
(Packed Tons)

Country of Destination	2011-2012	*2012-2013*	Percent Gain/Loss (2011-2012=100%)
European Countries			
Austria	253	224	-11.48%
Belgium	922	377	-59.10%
Denmark	3,504	2,928	-16.44%
Ireland	767	344	-55.11%
Finland	1,726	1,649	-4.46%
France	210	164	-22.25%
Germany	10,788	11,099	2.88%
Israel	771	388	-49.60%
Italy	44	89	101.56%
Netherlands	3,608	3,337	-7.53%
Norway	3,305	3,146	-4.80%
Spain	499	449	-9.98%
Sweden	7,033	6,532	-7.12%
Switzerland	1	0	-100.00%
United Kingdom	13,282	11,999	-9.65%
Total European Countries	46,713	42,725	-8.54%
Latin American Republics			
Brazil	554	589	6.25%
Colombia	264	315	19.54%
Costa Rica	194	233	20.63%
Dominican Republic	850	862	1.46%
Ecuador	14	4	-69.08%
Mexico	4,015	3,131	-22.01%
Panama	446	471	5.73%
Puerto Rico	0	42	100.00%
Venzuela	397	106	-73.29%
Others	999	1,074	7.53%
Total Latin American Republics	7,733	6,829	-11.69%
Other Countries			
Australia	8,511	3,199	-62.41%
China	11,949	9,006	-24.63%
Hong Kong	1,642	1,600	-2.55%
Iceland	305	300	-1.66%
Indonesia	1,206	1,531	26.90%
Japan	18,727	19,450	3.86%
South Korea	3,730	4,551	22.02%
Malaysia	3,563	3,557	-0.16%
New Zealand	1,652	1,753	6.13%
USSR - Russia	143	64	-55.14%
Philippines	2,311	2,380	2.99%
Singapore	1,246	1,562	25.31%
Taiwan	4,007	4,476	11.71%
Thailand	2,123	2,024	-4.68%
Others	3,812	3,809	-0.08%
Total Other Countries	64,927	59,262	-8.72%
GRAND TOTAL	119,373	108,816	-8.84%

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Table 4 ZC

Free Tonnage Shipments By Country of Destination
Zante Currant Raisins
August 1 - July 31
(Packed Tons)

Country of Destination	2011-2012	*2012-2013*	Percent Gain/Loss (2011-2012=100%)
European Countries			
Austria	0	0	0.00%
Belgium	0	0	0.00%
Denmark	0	0	0.00%
Ireland	0	0	0.00%
Finland	0	0	0.00%
France	0	0	0.00%
Germany	0	0	0.00%
Israel	29	16	-44.74%
Italy	0	0	0.00%
Netherlands	0	0	0.00%
Norway	0	0	0.00%
Spain	0	0	0.00%
Sweden	7	9	29.63%
Switzerland	0	0	0.00%
United Kingdom	0	0	0.00%
Total European Countries	36	25	-30.52%
Latin American Republics			
Brazil	39	44	13.71%
Colombia	0	0	0.00%
Costa Rica	0	0	0.00%
Dominican Republic	0	0	0.00%
Ecuador	0	0	0.00%
Mexico	1	0	-100.00%
Panama	0	0	0.00%
Puerto Rico	0	0	0.00%
Venzuela	0	0	0.00%
Others	0	0	0.00%
Total Latin American Republics	40	44	9.45%
Other Countries			
Australia	42	24	-42.25%
China	236	344	45.54%
Hong Kong	12	0	-100.00%
Iceland	0	0	0.00%
Indonesia	116	64	-44.60%
Japan	291	435	49.50%
South Korea	6	8	26.73%
Malaysia	34	224	565.75%
New Zealand	0	0	0.00%
USSR - Russia	10	0	-100.00%
Philippines	61	9	-85.54%
Singapore	21	42	100.26%
Taiwan	0	12	100.00%
Thailand	0	0	0.00%
Others	0	0	0.00%
Total Other Countries	829	1,162	40.13%
GRAND TOTAL	906	1,231	35.95%

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Table 4A

Free Tonnage Export Shipments

(Excluding Canada)

Natural Seedless Raisins

2008 - 2012

(Packed Tons)

	2008-2009	2009-2010	2010-2011	2011-2012	*2012-2013*
August	13,778	15,767	15,156	12,636	11,805
September	14,897	19,494	10,434	11,561	11,309
October	13,869	10,429	4,828	10,006	9,939
November	5,456	8,087	8,428	10,790	7,569
December	8,335	11,816	10,275	9,574	7,773
January	9,877	12,668	11,313	9,325	8,803
February	6,502	11,088	9,317	8,625	8,714
March	8,441	12,435	11,661	9,066	9,217
April	11,123	12,346	11,706	8,867	8,737
May	8,882	13,664	11,425	10,164	8,566
June	12,244	11,666	12,030	10,005	7,421
July	12,385	12,786	12,625	8,754	8,963
TOTAL YEAR	125,789	152,246	129,198	119,373	108,816

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Table 4B

Free Tonnage Export Shipments

(Excluding Canada)

Zante Currant Raisins

2008 - 2012

(Packed Tons)

	2008-2009	2009-2010	2010-2011	2011-2012	*2012-2013*
August	208	112	121	84	125
September	291	39	96	92	84
October	214	154	30	102	61
November	270	70	109	89	100
December	58	73	67	29	54
January	40	42	91	25	46
February	234	49	51	58	142
March	45	48	35	69	172
April	162	50	106	64	148
May	96	42	108	78	146
June	63	45	58	97	51
July	90	57	131	118	102
TOTAL YEAR	1,771	781	1,003	905	1,231

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Table 5

Free Tonnage Shipments To Domestic And Canadian Markets

(Including Government)

Natural Seedless Raisins

2008 - 2012

(Packed Tons)

	2008-2009		2009-2010		2010-2011		2011-2012		*2012-2013*	
	Tons	**%**	**Tons**	**%**	***Tons***	***%***	***Tons***	***%***	***Tons***	***%***
August										
Packed	5,479	35	5,701	39	5,673	37	6,445	39	5,656	34
Bulk	10,274	65	8,737	61	9,609	63	10,251	61	11,017	66
TOTAL	**15,753**	100	**14,438**	100	**15,282**	100	**16,696**	100	**16,673**	100
September										
Packed	5,887	37	6,823	39	6,677	39	6,091	37	5,234	36
Bulk	9,844	63	10,591	61	10,420	61	10,395	63	9,358	64
TOTAL	**15,731**	100	**17,414**	100	**17,097**	100	**16,486**	100	**14,592**	100
October										
Packed	7,035	38	6,937	41	6,478	38	6,577	39	6,624	37
Bulk	11,614	62	10,012	59	10,727	62	10,264	61	11,368	63
TOTAL	**18,649**	100	**16,949**	100	**17,205**	100	**16,841**	100	**17,992**	100
November										
Packed	6,208	39	7,944	45	6,509	41	6,665	40	6,450	41
Bulk	9,661	61	9,869	55	9,543	59	10,107	60	9,405	59
TOTAL	**15,869**	100	**17,813**	100	**16,052**	100	**16,772**	100	**15,855**	100
December										
Packed	6,602	44	6,235	42	6,253	39	5,612	38	5,485	41
Bulk	8,437	56	8,755	58	9,971	61	9,014	62	7,980	59
TOTAL	**15,039**	100	**14,990**	100	**16,224**	100	**14,626**	100	**13,465**	100
January										
Packed	5,328	33	5,774	40	5,936	39	5,197	36	5,443	35
Bulk	10,716	67	8,814	60	9,295	61	9,270	64	9,991	65
TOTAL	**16,044**	100	**14,588**	100	**15,231**	100	**14,467**	100	**15,434**	100
February										
Packed	5,914	41	4,021	29	5,264	38	5,097	33	4,712	33
Bulk	8,473	59	9,818	71	8,687	62	10,212	67	9,637	67
TOTAL	**14,387**	100	**13,839**	100	**13,951**	100	**15,309**	100	**14,349**	100
March										
Packed	5,854	35	6,472	37	6,464	38	5,990	36	5,575	36
Bulk	11,017	65	10,807	63	10,502	62	10,574	64	9,995	64
TOTAL	**16,871**	100	**17,279**	100	**16,966**	100	**16,564**	100	**15,570**	100
April										
Packed	5,687	36	5,862	36	5,452	39	4,824	33	4,846	30
Bulk	10,225	64	10,235	64	8,654	61	9,905	67	11,472	70
TOTAL	**15,912**	100	**16,097**	100	**14,106**	100	**14,729**	100	**16,318**	100
May										
Packed	5,558	36	4,673	34	4,867	37	4,188	29	4,819	30
Bulk	9,837	64	9,197	66	8,169	63	10,073	71	11,189	70
TOTAL	**15,395**	100	**13,870**	100	**13,036**	100	**14,261**	100	**16,008**	100
June										
Packed	5,775	34	4,691	32	4,858	37	3,953	31	4,574	38
Bulk	11,070	66	10,081	68	8,299	63	8,947	69	7,344	62
TOTAL	**16,845**	100	**14,772**	100	**13,157**	100	**12,900**	100	**11,918**	100
July										
Packed	5,731	37	5,092	36	4,995	41	4,475	32	4,880	30
Bulk	9,703	63	9,035	64	7,042	59	9,577	68	11,363	70
TOTAL	**15,434**	100	**14,127**	100	**12,037**	100	**14,052**	100	**16,243**	100
TOTAL YEAR										
Packed	71,058	37	70,225	38	69,426	38	65,114	35	64,298	35
Bulk	120,871	63	115,951	62	110,918	62	118,589	65	120,119	65
TOTAL	**191,929**	100	**186,176**	100	**180,344**	100	**183,703**	100	**184,417**	100

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Table 6

Free Tonnage Shipments To All Market Outlets
2005 - 2012
(Sweatbox Tons)

Variety	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	*2012-13*
Natural Seedless								
Domestic & Canada	195,822	203,889	201,355	200,775	194,879	191,211	196,682	194,950
Export Free	102,632	109,727	148,243	131,587	159,363	136,982	127,808	115,031
Total	**298,454**	**313,616**	**349,598**	**332,361**	**354,242**	**328,193**	**324,490**	**309,981**
Dipped Seedless								
Domestic & Canada	5,527	5,628	4,668	3,192	4,389	5,397	1,876	3,195
Export Free	8	0	0	0	23	34	184	585
Total	**5,534**	**5,628**	**4,668**	**3,192**	**4,412**	**5,431**	**2,060**	**3,780**
Golden Seedless								
Domestic & Canada	12,897	13,505	12,620	12,899	12,632	14,066	13,419	13,697
Export Free	4,218	3,312	5,404	5,832	5,245	6,521	5,828	5,392
Total	**17,115**	**16,817**	**18,024**	**18,731**	**17,877**	**20,587**	**19,247**	**19,089**
Zante Currants								
Domestic & Canada	1,648	1,481	1,717	1,786	1,583	1,307	1,448	1,777
Export Free	931	1,041	3,222	2,060	895	1,205	1,089	1,458
Total	**2,579**	**2,522**	**4,939**	**3,846**	**2,478**	**2,512**	**2,537**	**3,235**
Sultanas								
Domestic & Canada	32	255	85	78	83	57	60	64
Total	**32**	**255**	**85**	**78**	**83**	**57**	**60**	**64**
Muscats								
Domestic & Canada	6	4	9	14	0	2	0	23
Export Free	0	0	0	0	0	0	0	0
Total	**6**	**4**	**9**	**14**	**0**	**2**	**0**	**23**
Monukka Type								
Domestic & Canada	137	228	338	376	153	109	126	108
Export Free	1	0	1	1	0	0	0	0
Total	**138**	**228**	**339**	**377**	**153**	**109**	**126**	**108**
Other Seedless								
Domestic & Canada	5,023	4,135	5,141	5,408	6,716	9,374	6,283	7,873
Export Free	375	421	802	942	1,367	1,482	2,659	1,559
Total	**5,398**	**4,556**	**5,943**	**6,350**	**8,083**	**10,856**	**8,942**	**9,432**
Other Seedless Sulfured								
Domestic & Canada	693	1,110	655	254	462	456	430	311
Export Free	0	0	0	0	23	166	100	59
Total	**693**	**1,110**	**655**	**254**	485	**622**	**530**	**370**
TOTAL ALL VARIETIES	**329,950**	**344,736**	**384,260**	**365,203**	**387,813**	**368,369**	**357,992**	**346,082**
Government Reserve - Nat'ls	**0**	**982**	**0**	**0**	**0**	**0**	**0**	**0**
Government Reserve - Zantes	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

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Table 6A

Free Tonnage Shipments To All Market Outlets
2005 - 2012
(Packed Tons)

Variety	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	*2012-13*
Natural Seedless								
Domestic & Canada	186,358	188,944	193,609	191,929	186,176	180,344	183,703	184,417
Export Free	97,672	101,684	142,541	125,789	152,246	129,198	119,373	108,816
Total	**284,030**	**290,628**	**336,150**	**317,718**	**338,422**	**309,542**	**303,076**	**293,233**
Dipped Seedless								
Domestic & Canada	5,111	4,673	3,651	3,480	3,629	4,803	1,618	2,847
Export Free	8	0	0	0	19	30	158	522
Total	**5,119**	**4,673**	**3,651**	**3,480**	**3,648**	**4,833**	**1,776**	**3,369**
Golden Seedless								
Domestic & Canada	11,084	12,384	11,263	11,539	11,699	12,614	11,986	12,486
Export Free	3,625	3,037	4,823	5,217	4,858	5,848	5,206	4,915
Total	**14,709**	**15,421**	**16,086**	**16,756**	**16,557**	**18,462**	**17,192**	**17,401**
Zante Currants								
Domestic & Canada	1,403	1,244	1,535	1,536	1,382	1,090	1,205	1,501
Export Free	792	875	2,881	1,771	781	1,003	905	1,231
Total	**2,195**	**2,119**	**4,416**	**3,307**	**2,163**	**2,093**	**2,110**	**2,732**
Sultanas								
Domestic & Canada	32	181	42	56	52	37	58	57
Total	**32**	**181**	**42**	**56**	**52**	**37**	**58**	**57**
Muscats								
Domestic & Canada	6	4	5	2	0	2	0	0
Export Free	0	0	0	0	0	0	0	0
Total	**6**	**4**	**5**	**2**	**0**	**2**	**0**	**0**
Monukka Type								
Domestic & Canada	124	208	269	347	126	101	142	71
Export Free	1	0	1	1	0	0	0	0
Total	**125**	**208**	**270**	**348**	**126**	**101**	**142**	**71**
Other Seedless								
Domestic & Canada	4,573	3,135	4,944	4,363	5,386	7,237	5,750	7,114
Export Free	342	319	771	760	1,096	1,144	2,434	1,409
Total	**4,915**	**3,454**	**5,715**	**5,123**	**6,482**	**8,381**	**8,184**	**8,523**
Other Seedless Sulfured								
Domestic & Canada	495	555	491	406	422	396	450	328
Export Free	0	0	0	0	21	144	105	62
Total	**495**	**555**	**491**	**406**	**443**	**540**	**555**	**390**
TOTAL ALL VARIETIES	**311,626**	**317,243**	**366,826**	**347,196**	**367,893**	**343,991**	**333,093**	**325,776**
Government Reserve - Nat'ls	**0**	**923**	**0**	**0**	**0**	**0**	**0**	**0**
Government Reserve - Zantes	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

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Table 7

Free Tonnage Shipments To Domestic And Canadian Markets
(Including Government)
Natural Seedless Raisins
1997 - 2012
(Packed Tons)

Crop Year	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Total
1997-98	16,646	16,654	18,624	15,110	14,508	13,829	11,207	15,126	13,478	12,287	13,586	13,917	174,972
*1998-99	15,620	14,734	19,730	15,400	13,686	14,019	13,751	16,118	11,302	10,850	12,897	11,569	169,676
1999-2000	14,081	13,757	17,721	15,389	12,668	10,260	11,082	14,355	12,299	12,963	13,975	7,775	156,325
2000-01	11,303 **	9,391 **	13,002 **	11,793 **	23,696	20,097	14,028	14,611	15,275	13,249	13,324	14,348	174,117
2001-02	17,192	13,049	18,783	15,541	11,745	15,457	12,655	13,878	14,187	13,815	12,253	16,065	174,620
2002-03	16,163	16,661	17,326	15,181	13,496	14,971	12,147	15,556	14,059	13,661	12,835	14,998	177,054
2003-04	13,761	17,209	18,345	14,976	14,326	14,663	14,965	16,557	14,086	12,819	13,742	14,636	180,085
*2004-05	17,930	17,431	17,644	16,638	16,166	15,088	14,385	17,298	17,717	14,014	15,525	13,844	193,680
2005-06	18,773	17,176	17,600	17,322	14,255	14,502	14,440	17,066	14,914	13,331	16,065	10,914	186,358
2006-07	16,991	16,214	18,942	16,066	13,685	15,136	14,589	16,853	15,759	16,448	12,451	15,810	188,944
2007-08	17,805	14,936	18,918	16,826	13,117	17,155	16,624	16,097	15,936	15,166	13,940	17,089	193,609
2008-09	15,753	15,731	18,649	15,869	15,039	16,044	14,387	16,871	15,912	15,395	16,845	15,436	191,929
2009-10	14,438	17,414	16,949	17,813	14,990	14,588	13,839	17,279	16,097	13,870	14,772	14,127	186,176
*2010-11	15,282	17,097	17,205	16,052	16,224	15,231	13,951	16,966	14,106	13,036	13,157	12,037	180,344
*2011-12	16,696	16,486	16,841	16,772	14,626	14,467	15,309	16,564	14,729	14,261	12,900	14,052	183,703
2012-13	16,673	14,592	17,992	15,855	13,465	15,434	14,349	15,570	16,318	16,008	11,918	16,243	184,417
TEN YEAR AVERAGE	16,410	16,429	17,908	16,419	14,589	15,231	14,684	16,712	15,558	14,435	14,131	14,419	186,924

* No Pool Established

** Months shipments under reported and tonnage recorded Dec/Jan.

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Table 8

Free Tonnage Made Available For Disposition In Commercial Trade Channels
Natural Seedless Raisins
2003 - 2012
(Sweatbox Tons)

	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	*2012-13*
Natural Seedless Total Deliveries	296,864 (a)	265,262	319,126	282,999	329,288	364,268	298,532	354,878	346,132	311,090
Free Tonnage Purchasec	207,818	265,262	263,287	254,703	279,895	316,913	253,752	354,878	346,132	311,090
Reserve Tonnage Purchased (b	61,186	72,789	31,975	52,689	69,604	35,844	56,798	64	0	0
Total Tonnage Purchasec	269,004	338,051	295,262	307,392	349,499	352,757	310,550	354,942	346,132	311,090
Packers' August 1 Carryin (c	129,345	95,003	114,792	111,444	105,430	106,249	126,824	83,143	110,206	132,061
Total Disposable Tonnage	398,349	433,054	410,054	418,836	454,929	459,006	437,374	438,085	456,338	443,151
Commercial Shipments	304,236	317,998	298,454	313,616	349,598	332,362	354,242	328,193	324,490	309,981
July 31 Carryout (calculated)	94,113	115,056	111,600	105,220	105,331	126,645	83,132	109,892	131,848	133,170

(a) Includes Diversion Tonnage
(b) Export and 10+10
(c) Packers' Carryin Inventory Report

Table 9

SUPPLY AND DISPOSITION
NATURAL SEEDLESS RAISINS
2003-2012
(Sweatbox Tons)

	2003-04	2004-05	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	*2012-2013*
Total Disposable Free Tonnage	398,349	433,054	410,054	418,836	454,929	459,006	437,374	438,085	456,338	443,151
Disposition										
Domestic & Canada	191,376	205,002	195,822	203,889	201,355	200,775	194,879	191,211	196,682	194,950
Export Free	112,860	112,996	102,632	109,727	148,243	131,587	159,363	136,982	127,808	115,031
Total Disposition	304,236	317,998	298,454	313,616	349,598	332,362	354,242	328,193	324,490	309,981
Carryout (Calculated)	94,113	115,056	111,600	105,220	105,331	126,644	83,132	109,892	131,848	133,170
Reserve Tonnage										
Total Available Supply	221,951	101,358	82,096	77,783	70,257	48,002	56,934	71	2	0
Released for Export*	0	0	0	0	0	25,438	11,604	0	0	0
Other Disposition	221,951	101,358	82,096	77,783	70,257	22,564	45,330	71	2	0
Exports										
Free Tonnage	112,860	112,996	102,632	109,727	148,243	131,587	159,363	136,982	127,808	115,031
Reserve Shipments	0	0	0	0	0	0	0	0	0	0
Total Exports	112,860	112,996	102,632	109,727	148,243	131,587	159,363	136,982	127,808	115,031

* Raisin-Back

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Table 10

Supply And Disposition Of Reserve Pool Tonnage
Natural Seedless Raisins
2005-2012
(Sweatbox Tons)

	2005-2006 Crop Year	2006-2007 Crop Year	2007-2008 Crop Year	2008-2009 Crop Year	2009-2010 Crop Year	2010-2011 Crop Year	2011-2012 Crop Year	*2012-2013 Crop Year*
SUPPLY								
Reserve Tonnage	55,839	28,297	49,393	47,355	44,780	0	0	0
Carry In From Previous Year	26,257	49,486	20,864	647	12,154	71	2	0
Total Reserve Supply	82,096	77,783	70,257	48,002	56,934	71	2	0
DISPOSITION								
10 & 10**	31,975	52,689	69,604	10,406	45,194	64	0	0
Export*	0	0	0	25,438	11,604	0	0	0
Raisin Diversion Program	0	0	0	0	0	0	0	0
Government	0	982	0	0	0	0	0	0
Non-Normal Outlets	0	0	0	0	0	0	0	0
Distillation	0	0	0	0	0	0	0	0
Donations	635	1,139	6	4	15	3	2	0
Miscellaneous	0	2,109	0	0	50	2	0	0
Carry Out To Subsequent Year	49,486	20,864	647	12,154	71	2	0	0
Total Disposition	82,096	77,783	70,257	48,002	56,934	71	2	0

** Includes all Reserve for Free Usage Sales

* Raisin-Back

RAC - September 2013

Table 11

Supply And Disposition Of Reserve Pool Tonnage
Natural Seedless Raisins
2012-2013 Crop Year
(Sweatbox Tons)

SUPPLY			
Reserve Tonnage	**0**		
Carry In From Previous Crop Year	**0**		
Total Reserve Supply			**0**
DISPOSITION			
10 & 10	**0**		
67(j)	**0**		
Export	**0**		
Raisin Diversion Program	**0**		
Government/Food Aid	**0**		
Non-Normal Outlets	**0**		
Exemption/Loss	**0**		
Donations	**0**		
Total Disposition			**0**
Carry Out To Subsequent Crop Year			**0**

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Table 12

Reserve Pool Percentages
Natural Seedless Raisins
1998-2012

Crop Year	Preliminary Percentages Free	Preliminary Percentages Reserve	Secretary Established Free	Secretary Established Reserve	Date Established	Basis for Pool Payments Free	Basis for Pool Payments Reserve
1998-99	85	15	100	0	01/15/99	100	0
1999-2000	73	27	85	15	06/23/00	85	15
2000-01	35	65	53	47	08/01/01	53	47
2001-02	56	44	63	37	07/19/02	63	37
2002-03	41	59	53	47	04/03/03	53	47
2003-04	65	35	70	30	08/10/04	70	30
2004-05	100	0	100	0	10/05/04	100	0
2005-06	74	26	82.5	17.5	05/23/06	82.5	17.5
2006-07	89.75	10.25	90	10	04/10/07	90	10
2007-08	84.75	15.25	85	15	02/20/08	85	15
2008-09	86.75	13.25	87	13	03/10/09	87	13
2009-10	84.75	15.25	85	15	06/25/10	85	15
2010-11	100	0	100	0	10/05/10	100	0
2011-12	100	0	100	0	08/15/11	100	0
2012-13	100	0	100	0	08/15/12	100	0

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Table 13

Comparison Of Packer Acquisitions By Week
Natural Seedless Raisins
2008-2012
(Sweatbox Tons)

Week of Delivery	2008-2009	2009-2010	2010-2011	2011-2012	*2012-2013*
1	9,858	0	7,041	172	64
2	63	0	1,362	15	130
3	0	0	1,350	303	1,181
4	5	47	752	2,383	1,000
Comparative 4 Week Total	9,926	47	10,505	2,873	2,375
5	604	90	1,376	22	119
6	873	2,506	1,053	97	1,510
7	3,769	5,368	1,423	492	2,826
8	9,837	9,815	4,459	3,364	10,782
9	13,417	22,195	10,394	9,596	18,663
Comparative 5 Week Total	28,500	39,974	18,705	13,571	33,900
10	18,962	38,094	22,669	12,455	26,281
11	24,319	29,239	30,781	19,225	34,830
12	42,918	32,437	33,332	21,203	31,458
13	28,560	29,838	27,798	22,864	28,078
Comparative 4 Week Total	114,759	129,608	114,580	75,747	120,647
14	30,100	24,054	34,013	23,197	24,869
15	25,770	25,535	28,483	24,999	15,751
16	23,219	12,521	23,320	21,531	10,453
17	8,962	7,559	8,681	10,181	4,163
Comparative 4 Week Total	88,051	69,669	94,497	79,908	55,236
18	14,541	7,373	12,488	16,239	17,688
19	11,542	5,401	10,716	13,478	7,932
20	8,675	5,654	14,013	11,433	5,428
21	1,966	2,002	6,419	10,394	10,622
22	4,370	1,773	5,402	5,485	1,093
Comparative 5 Week Total	41,094	22,203	49,038	57,029	42,763
23	7,905	5,001	4,888	7,273	2,865
24	11,856	4,455	4,461	13,813	3,449
25	3,110	1,800	3,691	5,995	9,370
26	4,633	2,015	4,027	5,645	3,679
Comparative 4 Week Total	27,504	13,271	17,067	32,726	19,363
27	3,666	2,534	2,436	5,055	5,035
28	5,166	2,500	3,384	4,895	2,424
29	2,131	2,594	3,237	6,905	1,447
30	2,473	1,191	4,784	8,647	1,489
Comparative 4 Week Total	13,436	8,819	13,841	25,502	10,395

Table 13

Comparison Of Packer Acquisitions By Week
Natural Seedless Raisins
2008-2012
(Sweatbox Tons)

Week of Delivery	2008-2009	2009-2010	2010-2011	2011-2012	*2012-2013*
31	6,046	1,716	3,695	5,111	1,520
32	2,126	1,833	2,219	11,187	1,718
33	1,378	2,257	3,062	1,302	1,469
34	8,329	1,813	2,428	2,431	1,960
Comparative 4 Week Total	17,879	7,619	11,404	20,031	6,667
35	988	1,373	1,843	1,892	1,366
36	203	419	2,033	4,010	519
37	735	769	1,348	2,084	760
38	2,141	913	1,495	2,961	629
39	1,605	307	1,081	1,433	884
Comparative 5 Week Total	5,672	3,781	7,800	12,380	4,158
40	1,530	258	1,826	1,882	1,162
41	769	1,201	1,549	1,919	835
42	946	743	1,238	1,493	1,509
43	1,129	275	1,536	1,738	1,397
Comparative 4 Week Total	4,374	2,477	6,149	7,032	4,903
44	463	230	1,058	1,758	1,241
45	300	634	1,223	1,833	1,044
46	376	(25)	428	1,291	740
47	478	48	439	1,486	186
Comparative 4 Week Total	1,617	887	3,148	6,368	3,211
48	943	143	1,776	2,826	22
49	1,736	0	3,358	3,650	19
50	1,845	2	1,445	137	567
51	3,114	5	1,353	535	682
52	3,818	27	212	5,817	6,182
Comparative 5 Week Total	11,456	177	8,144	12,965	7,472
YEARLY TOTAL	364,268	298,532	354,878	346,132	311,090

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Table 14

Free Tonnage Supply And Demand Situation
Natural Seedless Raisins
1998-2012
(Sweatbox Tons)

	SUPPLY						SHIPMENTS			
Crop Year	Acquired	Percent Free	Free Tonnage	Carryin	Purchased From Reserve	Total Free Supply	Canada and Domestic	Export (Free)	Total Disposition	Computed Carryout
1998-99	240,469	100.0	240,469	98,291	59,844	398,604	181,666	115,234	296,900	101,704
1999-2000	299,910	85.0	254,923	101,946	3,586	360,455	166,127	97,342	263,469	96,986
2000-01	432,616	53.0	229,287	97,109	84,867	411,263	185,429	109,598	295,027	116,236
2001-02	377,328	63.0	237,716	116,131	76,827	430,674	186,361	112,272	298,633	132,041
2002-03	388,010	53.0	205,668 **	132,135	76,146	413,949	189,160	108,480	297,640	116,309
2003-04	296,864	70.0	207,818 **	129,345	61,186	398,349	191,376	112,860	304,236	94,113
2004-05	265,262	100.0	265,262	95,003	72,789	433,054	205,002	112,996	317,998	115,056
2005-06	319,126	82.5	263,287 **	114,792	31,975	410,054	195,822	102,632	298,454	111,600
2006-07	282,999	90.0	254,703 **	111,444	52,689	418,836	203,889 ***	109,727	313,616	105,220
2007-08	329,288	85.0	279,895	105,430	69,604	454,929	201,355 ***	148,243	349,598	105,331
2008-09	364,268	87.0	316,913	106,249	35,844	459,006	200,775 ***	131,587	332,362	126,644
2009-10	298,532	85.0	253,752	126,824	56,798	437,374	194,879 ***	159,363	354,242	83,132
2010-11	354,878	100.0	354,878	83,143	64	438,085	191,211 ***	136,982	328,193	109,892
2011-12	346,132	100.0	346,132	110,206	0	456,338	196,682 ***	127,808	324,490	131,848
2012-13	311,090	100.0	311,090	132,061	0	443,151	194,950 ***	115,031	309,981	133,170
TEN YEAR AVERAGE										
	316,844	90 *	285,373	111,450	38,095	434,918	197,594	125,723	323,317	111,601

* Percentage is a weighted average
** Adjusted for exempt tonnage
***Includes Government Free

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Table 15

Calculated Free Tonnage Disappearance
Natural Seedless Raisins
2003-2012
(Sweatbox Tons)

Crop Year	Reported Beginning Physical Inventory	Free Tonnage	Reported Ending Physical Inventory	Free Tonnage Disappearance	Handler Reported Shipments (Packed Tons)	Calculated Shrink (a)
2003-04	129,345	269,004	95,003	303,346	286,286	5.62%
2004-05	95,003	338,051	114,792	318,262	300,435	5.60%
2005-06	114,792	295,262	111,444	298,610	284,030	4.88%
2006-07	111,444	307,392	105,430	313,406	290,628	7.27%
2007-08	105,430	349,499	106,249	348,680	336,150	3.59%
2008-09	106,249	352,757	126,824	332,182	317,718	4.35%
2009-10	126,824	310,550	83,143	354,232	338,422	4.46%
2010-11	83,143	354,942	110,206	327,878	309,542	5.59%
2011-12	110,206	346,132	132,061	324,277	303,076	6.54%
2012-13	132,061	311,090	132,407	310,744	293,233	5.64%

(a) The calculated shrinkage was determined by dividing Handler Reported Shipments by Free Tonnage Disappearance and deducting the result from 100%.

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Table 16

Natural Seedless Raisins Diversion Program
Historical Data
2002-2012

RDP Year	Number of Certificates Issued	Number of Acres	Number of Pounds	Average Tons/Acre
Combined--Diverted and Removed:				
2012	0	0	0	0
2011	0	0	0	0
2010	0	0	0	0
2009	0	0	0	0
2008	0	0	0	0
2007	0	0	0	0
2006	0	0	0	0
2005	0	0	0	0
2004	0	0	0	0
2003	236	8,198.20	30,598,695	1.87
2002	775	26,739.20	101,680,000	1.90
		34,937.40	132,278,695.00	1.89
Diverted:				
2012	0	0	0	0
2011	0	0	0	0
2010	0	0	0	0
2009	0	0	0	0
2008	0	0	0	0
2007	0	0	0	0
2006	0	0	0	0
2005	0	0	0	0
2004	0	0	0	0
2003	0	0	0	0
2002	573	20,907.00	79,150,000	1.89
		20,907.00	79,150,000.00	1.89
Removed:				
2012	0	0	0	0
2011	0	0	0	0
2010	0	0	0	0
2009	0	0	0	0
2008	0	0	0	0
2007	0	0	0	0
2006	0	0	0	0
2005	0	0	0	0
2004	0	0	0	0
2003	236	8,198.20	30,598,695	1.87
2002	202	5,832.20	22,530,000	1.93
		14,030.40	53,128,695.00	1.89

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Antioxidants

1. "A Randomized, Un-blinded, Single Research Site, Comparator Study of Raisins Versus Alternative Snacks on Cardiovascular Risk Factors In Generally Healthy Subjects"

Harold Bays MD, FACP, FACE, FNLA

This was a randomized, un-blinded, single research site, comparator study of raisins versus alternative snacks on cardiovascular risk factors in generally healthy subjects. Study participants were instructed to orally consume one prepackaged serving of raisins (90 kcal/serving), or one prepackaged comparator snack (100 kcal/serving) orally administered three times daily before breakfast, lunch, and dinner with 8 oz. of non-caloric fluid (preferably water) over 12 weeks.

Hypothesis of this study was that routine raisin consumption over 12 weeks would improve cardiovascular risk factors compared to generally equal calorie alternative snacks.

The objective of this study was to compare the effects of raisins three times per day versus alternative snacks three times per day on cardiovascular risk factors in generally healthy subjects.

Primary objective/endpoints were change at week 12 for raisin versus control snacks regarding:

- Fasting plasma glucose levels
- Plasma glucose levels 2 hours after administration of 75 g oral glucose
- Body weight

Secondary objective/endpoints were change at week 12 for raisin versus control snacks regarding:

- Hemoglobin A1c
- Blood pressure (systolic and diastolic)
- Body mass index

Other endpoints included laboratory of special interest

- Potassium
- Alanine aminotransferase (ALT)
- Aspartate aminotransferase (AST)
- Alkaline phosphatase (Alk Phos)
- Fasting serum insulin (Insulin was not an apriori "endpoint of special interest" in the protocol. It was added at time of study analysis due to its potential relevance to other measured metabolic parameters.)

Conclusion:
Overall, this study supports regular consumption of raisins as reducing the important cardiovascular risk factors of postprandial plasma glucose and blood pressure, which may help account for the favorable effects of grapes (and thus potentially raisins) on possibly reducing the risk for cardiovascular disease.

2. "Raisin Effects on Biomarkers of Coronary Heart Disease in Elderly Men and Women"

Maria Luz Fernandez, PhD, University of Connecticut

A randomized, controlled study with 17 men and women aged 50-70 years were involved in the study. They were encouraged to walk or to walk and eat 1 cup of raisins per day or just eat 1 cup of raisins per day. The intervention improved the lipid risk profile for all groups by resulting in a reduction in both total cholesterol and LDL-C. The authors suggested that the increase in fiber intake was a likely contributor to the reduction in LDL-C for RAISIN and RAISIN + WALK. The reduction in blood pressure for RAISIN and RAISIN + WALK may have resulted from antioxidant effects of the raisin polyphenols. In conclusion, risk factors for CVD were affected significantly by consuming raisins or increasing steps walked. Blood pressure, plasma total cholesterol and LDL-C were significantly decreased by all interventions, while walking lowered plasma TG. Raisins lowered the risk for inflammatory damage by decreasing one of the markers of inflammation associated with diabetes and coronary heart disease (tumor necrosis factor – alpha -TNF-α.).

3. "Raisins, Cyclo-oxygenase – 2 and Cancer Prevention"

Andrew J. Dannenberg, M.D., NewYork-Presbyterian Hospital/ Weill Medical College of Cornell University, New York, NY.

One of the antioxidant compounds in raisins and some other fruits and vegetables is catechin. When catechins were fed to tumor-prone mice by the noted cancer researcher Dr. Andrew Dannenberg and his colleagues, there was a 70 percent reduction in the number of tumors compared to control animals (not fed additional catechin). This type of study adds to the body of evidence linking phytochemical components of fruits and vegetables to reduction in the risk of colorectal cancer, colorectal adenomas and other gastrointestinal tumors.

4. "Antioxidant Capacity and Cholesterol Concentration in Human Subjects"

Carl L. Keen, Ph.D., Professor and Chair, Department of Nutrition, University of California – Davis, Davis, California.

Subjects eating raisins (4 servings) daily for 4 weeks increased the plasma antioxidant capacity. This in turn decreased the level of circulating oxidized low-density lipoprotein (LDL), so-called bad cholesterol, in subjects. High levels of LDL cholesterol are associated with increased cardiovascular disease. Oxidized LDL is especially problematic because the oxidized particles in the bloodstream are more likely to add to plaque on the artery wall. These data clearly show raisins are an important part of a diet that encourages 8 to 13 servings of fruit and vegetables loaded with important phytochemicals and antioxidants.

5. "Value of Raisins for Reduction of Oxidative Stress, Endothelial Dysfunction, and Inflammation in Obesity"

Janet Walberg Rankin, Ph.D., Professor in Human Nutrition, Foods, and Exercise, Virginia Tech., Blacksburg, Virginia.

Research expert on oxidative stress and disease, Janet Walberg Rankin, studied the effect of raisins with their important antioxidant contribution on oxidative stress and inflammation in overweight subjects. It is well known that oxidative stress triggers an inflammatory response that increases disease risk. Together with graduate student Mary Whitlock, Dr. Rankin looked at whether the modest, easily accessible raisin can benefit obese individuals. They showed lowered levels of markers of inflammation, C-reactive peptide (CRP) and interleukin-6 (IL-6). These findings are important because those eating high fat meals or who are obese have elevated levels of CRP and IL-6. High levels of these components adversely affect proper blood vessel functioning. Thus, those with high oxidative stress tend to have blood vessels that do not appropriately dilate and relax. Foods, such as raisins, that are good sources of antioxidants, especially flavonoids and phenolics, can be helpful in fighting oxidation stress and improving blood vessel function.

6. "Raisin effects on in vitro demineralization of teeth"

Clifton Carey, PhD, Director of Administration, American Dental Association – Paffenbarger Research Center

Strong evidence exists that food particles retained on the teeth will lead to Demineralization of the tooth enamel and dental caries. (caries) (Kashket et al, 1996). This led to the idea that foods which are perceived as 'sticky' will be more cariogenic than non-sticky snack foods. Raisins have been perceived by the general public and by pediatric dentists as the ninth stickiest food out of a list of twenty-one popular snacks. Despite this, there is no evidence that raisins contribute to the demineralization of teeth. In fact measurement of food that is on the tooth 5 minutes after swallowing showed that foods that are less soluble in oral fluids are retained for longer times. Specifically, raisins although perceived as quite sticky, they are easily cleared from the oral cavity. These observations suggest that raisins may not contribute to tooth demineralization significantly because the sugars are removed from the dentition before the plaque mass has the opportunity to generate sufficient acid to lower the pH below 5.5. There is also research that shows that raisins contain compounds that inhibit the *in vitro* growth of *S. mutans,* thus making raisins less cariogenic than other foods. However, the *in vitro* research with 10% raisin juice showed that it had the potential to demineralize tooth enamel but that this was less than orange juice with its citric acid.

7. "Raisins as a Functional Food for Oral Health"

Christine D. Wu, M.S., Ph.D., Professor, Department of Periodontics, University of Illinois, College of Dentistry, Chicago, Illinois.

Raisins contain compounds including oleanolic acid that inhibit *in vitro* growth of *Streptococcus mutans*, one of the major bacteria in the mouth responsible for tooth decay. Oleanolic acid and other compounds in raisins also inhibit organisms associated with periodontal disease, including *Porphyromonas gingivalis* and *Fusobacterium nucleatum*. Oleanolic acid is effective in suppressing *in vitro* plaque formation by *Streptococcus mutans*. Prevention of plaque formation on the tooth surface is critical both for preventing tooth decay and promoting healthy gums.

Food Preservation

8. "Phenolic Content, Antioxidant Activity and Antimicrobial Properties of Raisins in Food Systems"

Luis Cisneros-Zevallos, Ph.D., Assistant Professor, Department of Horticultural Sciences, Texas A&M University, College Station, Texas.

Raisins have a considerable concentration of phenolic compounds. This analysis showed that they were quinic and gallic acid, chlorogenic and caffeic acids, catechin, and epicatechin. Golden raisins have more of many of these compounds because the antioxidant effect of the sulfite used in golden raisins inhibits the loss of these compounds. Raisin juice extracts and concentrates also have significantly increased numbers of these compounds, so they have the potential to reduce the growth of harmful microorganisms and prevent browning of cut produce. According to studies conducted by Luis Cisneros-Zevallos and his team at Texas A&M, raisin extracts were shown to reduce the growth of known food pathogens such as *Listeria monocytogenes* and *Escherichia coli* 0157:H7 in a variety of model food systems. This has great importance to food safety and to the produce industry as a non-food additive solution to help extend the shelf life of food and reduce food-borne disease.

9. "Inhibition of Lipid Oxidation by Raisin Paste in Cooked Ground Meat"

Daren Cornforth, Ph.D., Professor, Nutrition & Food Sciences, Utah State University, Logan, Utah.

Raisins are recognized as a good source of dietary antioxidants. Adding raisin paste or extract to cooked ground beef or pork at just 1% to 2% of the weight improved its flavor after storage due to inhibition of rancidity by the antioxidants. Addition of the raisin extract to chicken at the same levels was also effective but did cause the meat to darken. In all cases the addition of the small amount of raisins did not affect the flavor of the meat.

10. "Evaluation of the Potential Anti-Microbial Properties of Raisins and Their Application in Food Safety and Preservation"

Mark A. Daeschel, Ph.D., Professor, Food Microbiology and Safety, Oregon State University, Corvallis, Oregon.

Pathogenic bacteria, including *Escherichia coli 0157:H7, Staphylococcus aureus* and *Listeria monocytogenes,* were inhibited in jerky systems containing 25% or 50% raisins. Raisins were shown to have the same preservative properties as sodium nitrite in meat systems. Raisins' innate combination of antioxidants, sugar and acids were shown to be as effective as the sodium nitrite in inhibiting organisms that cause food- borne disease and in maintaining food safety. This is good news because producers of jerky, sausages, hot dogs and other cured meats may be able to reduce or eliminate the use of nitrite additives.

Use of raisins to replace sodium nitrite in cured meats has many health benefits. First, the nitrite may form cancer-causing nitrosamines during digestion. Second, unlike the sodium nitrite, raisins

add no sodium. This is important for those on sodium-restricted diets. Third, addition of raisins may improve the overall nutritional profile of cured meats, such as jerky, since the raisins provide antioxidants and make it possible to produce a palatable product that is lower in fat.

Fiber

11. "Raisin Dietary Fiber: Composition and Characteristics"

Mary Ellen Camire, Ph.D., Professor, Department of Food Science and Human Nutrition, University of Maine, Orono, Maine.

Dietary fiber and other components may reduce the risk of heart disease and cancer by binding bile acids and causing their elimination from the body. Camire's study confirms that eating fibrous foods, such as raisins, caused the elimination of bile acids. This in turn stimulates the body to replace the excreted bile acids using its own cholesterol, thus potentially lowering serum cholesterol and the risk of coronary heart disease. Furthermore, bile acids that are bound by fibers such as those in raisins will not be metabolized in the gut to a more toxic form that can cause harmful changes on the colonic wall, and this may potentially reduce cancer risk.

12. "Raisins as a Source of Inulin"

Medallion Labs, Minneapolis, Minnesota.

California raisins are a good source of inulin, a naturally occurring fiber-like carbohydrate that helps keep the colon healthy. Independent laboratory analysis by Medallion Labs, a laboratory known for their analytical work for nutrition labeling in the U.S., showed that a standard 1/4-cup serving of California raisins contains 1.5 grams of inulin. Recommended daily intake levels of inulin have yet to be established. However, inulin is one of the soluble fibers. Health benefits of inulin are the subject of active research and new functions are being documented. Some of these include its effects on cholesterol levels and gut health. Its role as a prebiotic has received much attention because prebiotics are important to support immune function both in the gut and in the body.

13. "Beneficial Effects of Raisins on Colonic Function with Possible Implications for the Prevention of Colon Cancer"

Gene A. Spiller, Ph.D., Head, Sphera Foundation and Health Research Studies Center, Los Altos, California.

The combination of dietary fiber and tartaric acid in sun-dried raisins plays an important role in colon function and health. The study was designed to test the hypothesis that eating 2 to 4 servings of raisins per day may improve colonic health. Research by Dr. Spiller found a positive correlation between consuming sun-dried raisins and a reduction in some colon cancer risk factors. For example, raisins increased fecal weight and caused material to move through the colon faster (called faster transit time). Increased transit time and increased fecal weight is important not only to have a properly functioning gastrointestinal tract and to reduce constipation and

hemorrhoids, it also means that any toxic materials that might be in the diet or produced by metabolism in the gut will have little time to adversely affect the colon wall. Raisins reduced the alkalinity in the colon. Both the faster transit and lowered pH are associated with reduced colon cancer risk. The authors concluded that 2 servings of raisins per day caused moderate but beneficial changes in colon function.

Nutrient Composition

14. "The Impact of Pre-exercise Snacks on Exercise Intensity, Stress, and Fatigue in Children"

Debra R. Keast, PhD; Carol E. O'Neil, PhD, MPH, RD; Julie M. Jones, PhD, CNS, LN
Objective: This study examined the association of dried fruit consumption with nutrient intake, diet quality, and anthropometric indicators of overweight/obesity.

Design: Analyses of dietary and anthropometric data collected from adult (19+ years) participants (n=13,292) of the 1999-2004 National Health and Nutrition Examination Survey were conducted. Dried fruit consumers were defined as those consuming amounts ≥⅛ cup-equivalent fruit/day and identified using 24-hour recalls. Diet quality was measured using the Healthy Eating Index-2005 (HEI-2005). Covariate-adjusted means, standard errors, prevalence rates and odds ratios were determined to conduct statistical tests for differences between dried fruit consumers and non-consumers.

Results: Seven percent of the population consumed dried fruit. Adult shortfall nutrients for which there were mean intake differences ($p<0.01$) between consumers and non-consumers were: fiber (+6.6 g/d), vitamin A (+173µg RAE/d), vitamin E (+1.5 mg AT/d), vitamin C (+20 mg/d), calcium (+103 mg/d), magnesium (+72 mg/d), and potassium (+432 mg/d). Dried fruit consumers had improved MyPyramid food intake, including lower SoFAAS intake, and a higher SoFAAS score (11.1±0.2 vs 8.2±0.1) than non-consumers. The total HEI-2005 score was significantly higher ($p<0.01$) in consumers (59.3±0.5) than non-consumers (49.4±0.3). Covariate-adjusted weight (78.2±0.6 kg vs 80.7±0.3 kg), body mass index (27.1±0.2 vs 28.1±0.2), and waist circumference (94.0±0.5 vs 96.5±0.2) were lower ($p<0.01$) in consumers than non-consumers, respectively.

Conclusions: Dried fruit consumption was associated with improved nutrient intakes, a higher overall diet quality score, and lower body weight/adiposity measures.

Glycemic Effects, Sustainable Energy and Healthy Snacks

15. "Effects of Carbohydrate Supplementation Form on Gastrointestinal Tolerance and Running Performance"

Brandon Too, Sarah Cicai, Kali Hockett, Elizabeth Applegate, Brian A. Davis and Gretchen A. Casazza

Purpose: We examined the effects of raisins and sport chews on running performance and gastrointestinal (GI) tolerance.

Methods: This study recruited 11 competitive male (29.3 ± 2.4 yrs) endurance runners and triathletes to complete an 80-min sub-maximal (75% VO2peak) running bout followed immediately by a 5K time trial and a 10K time trial 24 hours later. Subjects ingested 3 randomized treatments (raisins, sport chews, and water only) with each treatment separated by 7 days. Heart rate (HR), respiratory exchange ratio (RER), blood glucose, lactate, free fatty acids (FFA), glycerol, insulin, electrolytes and creatine kinase, GI symptoms and rating of perceived exertion (RPE) were recorded every 20 minutes during the sub-maximal exercise test and at the end of the 5K. We also measured whole body muscle soreness and fatigue and mood disturbance via questionnaires.

Results: VO2, HR, body weight changes, muscle soreness and fatigue, total mood disturbance and RPE during the submaximal exercise bout did not differ due to treatment. However, RER was highest during the sport chews treatment, followed by the raisins and water was the lowest (0.92 ± 0.01, 0.91 ± 0.01, 0.89 ± 0.01 for raisin, chews and water respectively). FFA and glycerol were higher with water than both CHO treatments. Blood glucose was higher for both carbohydrate treatments compared to water. Plasma creatine kinase was higher for all exercise time points with raisins versus chews and water. Time to complete the 5K time trial was faster for both carbohydrate treatments (20.6 ± .8, 20.7 ± .8, 21.6 ± .8 min for raisin, chews and water respectively). GI disturbance was mild (less than 1 out of 6) for all treatments with only belching higher in both CHO treatments compared to water.

Conclusion: Both the raisins and sport chews maintained high blood glucose levels and improved running performance compared to water only. Running performance between the raisins and sport chews were similar and their GI tolerance was good. Raisins provided a good, natural carbohydrate source that had similar physiological and performance benefits as a commercially available product

16. "The Impact of Pre-exercise Snacks on Exercise Intensity, Stress, and Fatigue in Children"

Jennifer M. Sacheck, Tamar Kafka, Helen Rasmussen, Jeffrey B. Blumberg, and Christina D. Economos

Purpose: Few studies have examined how the composition of snacks affects athletic performance in children. We investigated whether the macronutrient and flavonoid

content of 3 pre-exercise snacks differentially affected exercise intensity, stress, and postgame fatigue in young soccer players.

Methods: At 1 h prior to a 50-min soccer game, 115 children (9.1 ± 0.9 y) were randomly assigned to consume 1 of 3 isocaloric snacks: 1) nutrient dense/high flavonoid (HF) raisin/nut bar; 2) low flavonoid (LF) peanut butter graham bar; or 3) low flavonoid/high sugar (LF/HS) rice cereal bar. Blood glucose and salivary cortisol and IgA were measured before consuming the snack and immediately following the game. Game exercise intensity was measured by accelerometry. Self-administered questionnaires were used to assess diet quality and physical and mental fatigue after the game.

Results: The children spent approximately 33% of the game in moderate to vigorous activity and 49% of the game in sedentary activity. The snack consumed was not related to exercise intensity. Mean post-exercise blood glucose ($P<0.001$) and cortisol ($P<0.05$) increased and IgA levels decreased ($P<0.001$) from pre-game values. The pre-exercise snack did not predict the post-exercise outcome for any of these parameters after controlling for pre-exercise values of the biomarkers, age, gender, BMI, exercise intensity, game-time water consumption, and diet quality. Children who reported symptoms of fatigue were more likely to have consumed the LF/HS snack ($P<0.05$).

Conclusion: The pre-exercise snacks formulated for this study did not affect blood sugar or salivary biomarkers of stress following a soccer game in young children. The nutrient content of the single snack did not differentially influence these biomarkers or the exercise intensity; however subjective feelings of fatigue may be associated with low flavonoid/high sugar snacks. Future investigations are warranted to further explore the effects of pre-exercise snacks on exercise, performance, stress and fatigue in children.

17.“Glycemic Index in the Management of Type 2 Diabetes Mellitus”

Carla Miller, PhD, RD, Ohio State University

The glycemic index of the diet decreased following a 9-week intervention in which 109 diabetics were instructed to increase their intake of fruit and dried fruit, total dietary fiber (including soluble and insoluble fiber) and the percentages of energy from protein and total fat (including saturated and monounsaturated fat) improved. IN addition to a changed GI of the diet, there was a significant reduction in body weight and body mass index (weight (kg)/height (m2)) in both men and women and a significant reduction in waist circumference in men. More fruit including raisins and other dried fruit was consumed following the intervention, which is consistent with the dietary pattern recommended in the Dietary Guidelines 2005. These studies show the importance of fruit, including dried fruit, and dietary fiber in the diet of diabetics. Thus, a carbohydrate-controlled portion of raisins can readily be incorporated into a well-constructed diabetic diet.

18. "Determination of the Glycemic and Insulinemic Responses to Raisins and the Application of Raisins as a Pre-exercise Snack for Persons with Impaired Glucose Tolerance"

Craig Mattern, Assistant Professor, State University of New York at Brockport

Raisins fed as a pre-exercise food to 22 exercisers (approximately half with normal and abnormal glucose tolerance) resulted in similar increases in blood glucose to those observed with a popular energy bar. These observed increases in blood glucose for raisins and energy bar were less than a standardized glucodex solution. The blood insulin response to the pre-exercise meal with raisins, especially in a sedentary population, produced statistically lower insulin values than the standardized glucose solution or the energy bar. All three test substances including Raisins resulted in similar mobilization of free fatty acids from adipose tissue during exercise. Thus, raisins resulted in a similar glucose response during exercise when compared to an energy bar and were less than the standardized glucose solution. The good news is that the insulin responses to raisin ingestion prior to, and in the early phases of exercise, were more favorable than those observed with the energy bar. Thus, raisins can be an excellent food for use by exercisers to help deliver the right kind of carbohydrates.

19. "Determination of the Glycemic and Insulinemic Indexes of Raisins in Three Populations"

Steve Hertzler, Ph.D., Assistant Professor of Nutrition, The Ohio State University, Columbus, Ohio.

The glycemic index (G.I.) and insulin index (I.I.) of raisins was determined on three different populations. In 10 sedentary adults, the G.I. of raisins was determined to be an average of 49.4. A nearly identical G.I. value for raisins was found for 10 prediabetic individuals. In the 11 endurance athletes, the G.I. of raisins was 62.3. As expected, the highest insulin index was found in prediabetic subjects (I.I. = 54.4) and the lowest was found in sedentary subjects (I.I. = 47.3). While the I.I. for athletes was 51.9, the overall insulin excursion in trained athletes was not nearly as great, showing the effects of training on insulin sensitivity and glucose utilization. Interestingly, California raisins in this study came in as a moderate glycemic food, which is different from the 'high' classification they are given in published tables. Data for published tables have not been collected on California raisins, and the population studied is not from the United States.

20. "Raisin Consumption and Exercise Performance of Endurance Athletes"

Mark Kern, Ph.D., Department of Exercise and Nutritional Sciences, University of California – San Diego, San Diego, California.

Raisins were shown to be a good alternative to sports gels in a study conducted with endurance athletes under two different conditions. In studies by Mark Kern, San Diego State professor and author of the CRC Desk Reference on Sports Nutrition (2005, CRC Press), endurance-trained cyclists (4 males and 4 females) completed two feeding-performance trials where changes in metabolism and cycling performance were compared after consumption of raisins (a moderate to

low glycemic index food) versus a commercial sports gel (a high glycemic index food). There were no differences in performance in the 45 minute cycling trial (at 75% VO2max). No gastrointestinal discomfort was reported with either the gel or raisins. Measures of metabolic substrates after exercise were the same with both the sports gel and raisins except there were more free fatty acids after the pre-exercise ingestion of raisins. This increase in the free fatty acids indicates that raisins subtly, but favorably, improved metabolism. The authors concluded that raisins have similar performance effects to commercial sports gel products, but raisins are a better alternative since they provide more micronutrients, an acid-neutralizing load to the kidneys and are a more cost-effective and convenient food for use during exercise.

21. "The Effects of a Raisin-Peanut Pre-Event Meal on Indices of Energy and Fatigue in Young, Trained Soccer Players (10-12 Years of Age) Playing a Standard Game"

Gene A. Spiller, Ph.D., Head, Sphera Foundation and Health Research and Studies Center, Los Altos, California.

Feeding raisins along with peanuts and water to 10 to12 year old children prior to a soccer game resulted in lower increases in blood glucose and insulin than a snack of a white bagel and lemonade. This is important because it means a more steady fuel supply to the exercising muscle of the young players. Lower insulin levels are advantageous because high levels of circulating insulin can promote the laying down of fat and may lead to insulin resistance, a concern among U.S. children today, where rates of obesity and type-2 diabetes are increasing dramatically.

Satiety

22. "The Effects of a Pre-Meal Raisin Snack on Satiety and Food Intake in Children"

Dr. G. Harvey Anderson, Professor, Nutritional Sciences and Physiology. Department of Nutritional Sciences, University of Toronto.

Three experiments were conducted to determine how raisin snacks influences appetite and calorie intake in 8-11 year old children.

First Experiment
Children were asked to visit the lab for three times and during each visit they were asked to eat until comfortably full one of three snacks: (1) raisins, (2) grapes or (3) a mix of almonds with raisins. In a half an hour, a lunch meal with pizza was provided to kids and again they were asked to eat it until they felt comfortably full. The results of this experiment indicated that after the raisin snack, kids consumed about 21% less pizza compared with other snacks. The total calories received from the snack and lunch meal were lower after raisins compared to other snacks.

Second Experiment
The equicaloric (150 kcal) snacks were provided to children and food intake was measured with a pizza meal in 30 min, similarly as in the first experiment. When total calories consumed were calculated after the snack and pizza meal, the calories after the snack with raisins were similar to

those after just water, while other snacks led to higher calorie intake when compared with water. It was concluded that raisins was the only snack that does not increase calorie intake when provided before a lunch meal.

Third Experiment

All children received the same breakfast (skim milk, cereals and orange juice), morning snack (medium apple) and the lunch (turkey sandwich with a cup of 2% milk). Then in the afternoon (between 3:30 and 4 pm in the lab) they ate, until comfortably full, one of the four after-school snacks: (1) raisins, (2) grapes, (3) potato chips and (4) chocolate chip cookies. The results of this experiment demonstrated that calorie intake after raisins was the lowest compared to other snacks. Thus, children consumed about 1.5 times more calories with grapes or potato chips, and about twice more calories with cookies.

Conclusion

The results of this project indicate that raisins compared to other popular snacks reduce appetite and provide the lowest energy intake.

FY 2012-2013

- Development of improved raisin grapes for mechanical harvest including types resistant to powdery mildew: David Ramming
- Breeding Rootstocks Resistant to Aggressive Root-Knot Nematodes: Peter Cousins
- Evaluation of Nematode Resistant Rootstocks for Use with Early Ripening Raisin Varieties Grown for Dried on the Vine Raisin Production: Stephen Vasquez
- Node position, shoot emergence, and yield components of cane-pruned raisin grapes: Matthew Fidelibus

FUNDED CROP PRODUCTION RESEARCH

FY 2011-2012

- Breeding rootstocks resistant to aggressive root-knot nematodes
  Principle Investigator: Peter Cousins
- Development of improved raisin grapes for mechanical harvest including types resistant to powdery mildew
  Principle Investigator: David Ramming
- Node position, shoot emergence, and yield components of cane-pruned raisin grapes
  Principle Investigator: Matthew Fidelibus
- Advancing maturity of raisin cultivars using potassium sprays applied just prior or during the ripening phase
  Principle Investigator: William Peacock

FUNDED CROP PRODUCTION RESEARCH

FY 2010-2011

- Advancing maturity of raisin cultivars using potassium sprays applied just prior or during the ripening phase, by Bill Peacock
- Sustainable Controls for Vine Mealybug – 2010, by Kent Daane
- Crop yield and economics of San Joaquin Valley vineyards under alternative weed management strategies, by Anil Shrestha
- Identifying and correlating populations to fruit damage in raisin production systems, by Stephen Vasquez
- Node position, shoot emergence, and yield components of cane-pruned raisin grapes, by Matthew Fidelibus
- Breeding Rootstocks Resistant to Aggressive Root-Knot Nematodes, by Peter Cousins
- Development of improved raisin grapes for mechanical harvest including types resistant to powdery mildew, by David Ramming

FUNDED CROP PRODUCTION RESEARCH

FY 2009-2010

- Breeding Rootstocks Resistant to Aggressive Root-Knot Nematodes, by Peter Cousins
- Advancing maturity of raisin cultivars using potassium sprays applied to fruit just prior or during the ripening phase, by Bill Peacock
- Development of improved raisin grapes for mechanical harvest including types resistant to powdery mildew, by David Ramming
- Sustainable Controls for Vine Mealybug, by Kent Daane
- Movento, Much More Than an Insect Growth Regulator, by M. McKenry
- Identifying raisin moth damage in raisin production systems, by Stephan Vasquez
- Evaluation of abscission agents for grapes, by Matthew Fidelibus

FY 2008-2009

- Evaluation of novel abscission agents to facilitate mechanical harvesting of raisin grapes, by Matthew Fidelibus
- Grapevine Cultivar and Drying Method Effects on Raisin Yield and Quality, by Matthew Fidelibus and Hildegarde Heymann
- Development of improved raisin grapes for mechanical harvest including types resistant to powdery mildew, by David Ramming
- Breeding Rootstocks Resistant to Aggressive Root-Knot Nematodes, by Peter Cousins
- Spider mite management, by N. Mills
- Sustainable Controls for Vine Mealybug: Mating Disruption, by Kent Daane
- Sustainable Controls for Vine Mealybug: Biological Control, by Kent Daane

FUNDED CROP PRODUCTION RESEARCH

FY 2007-2008

- Water use of Thompson Seedless grapevines growing in a weighing lysimeter and trained to an overhead trellis system used for dried on the vine (DOV) raisin production, by Larry Williams
- Evaluation of novel abscission agents to facilitate mechanical harvesting of raisin grapes, by Matthew Fidelibus
- Grapevine cultivar and drying method effects on raisin yield and quality, by David Ramming
- Development, Testing and Introduction of Grape Rootstocks with Broad and Durable Nematode Resistance, by Howard Ferris and M. Andrew Walker
- Breeding Rootstocks Resistant to Aggressive Root-Knot Nematodes, by Peter Cousins
- Sustainable Controls for Vine Mealybug: Mating Disruption, by Kent Daane

FUNDED CROP PRODUCTION RESEARCH

FY 2006-2007

- Cost of Feasibility of Mechanically Harvested Continuous Tray Dried Raisins, by Stephan Vasquez
- Overhead Arbor Trellis Systems: Canopy Structure and Function in Relation to Irrigation Requirements, by Matthew Fidelibus, Lawrence Schwanki, and Stephan Vasquez
- Evaluation of novel abscission agents to facilitate mechanical harvesting of raisin grapes, by Matthew Fidelibus and Carlos Crisosto
- Development of improved raisin grapes for mechanical harvest including types resistant to powdery mildew, by David Ramming
- Sustainable Controls for Vine Mealybug: Mating Disruption, by Kent Daane and Walt Bentley
- Development, Testing and Introduction of Grape Rootstocks with Broad and Durable Nematode Resistance, by Howard Ferris and M. Andrew Walker
- Grapevine Cultivar and Drying Method Effects on Raisin Yield and Quality, by Matthew Fidelibus and Hildegarde Heymann
- Breeding Rootstocks Resistant to Aggressive Root-Knot Nematodes, by Peter Cousins

FUNDED CROP PRODUCTION RESEARCH

FY 2005-2006

- Raisin Research on DOV Using the Within Row Alternate Bearing Method (WRAB DOV), by Bill Peacock
- Evaluation of Training Systems, Trellises, Row Direction, and Grape Cultivars for Dry-on-Vine (DOV) Raisin Production, by Matthew Fidelibus
- Evaluation of Canopy Separation and Defoliation Practices for Mechanized Raisin Harvest on Traditional Trellises, by Matthew Fidelibus and Stephan Vasquez
- Overhead Arbor Trellis Systems: Canopy Structure and Function in Relation to Irrigation Requirements, by Matthew Fidelibus and Stephan Vasquez
- Physiological Implications of Harvest Pruning Raisin Grapes, by Matthew Fidelibus and D. Smart
- Development of Improved Raisin Grapes for Mechanical Harvest including Types Resistant to Powdery Mildew, by David Ramming
- Development, Testing and Introduction of Grape Rootstocks with Broad and Durable Nematode Resistance, by Howard Ferris and M. Andrew Walker
- Breeding Rootstocks Resistant to Aggressive Root-Knot Nematodes, by Peter Cousins
- Sustainable Controls for Vine Mealybug: Mating Disruption, by Kent Daane

FUNDED CROP PRODUCTION RESEARCH

FY 2004-2005

- Development of Improved Raisin Grapes for Mechanical Harvest Including Types Resistant to Powdery Mildew, by David Ramming
- Breeding Rootstocks Resistant to Aggressive Root-Knot Nematodes, by Peter Cousins
- Development, Testing and Introduction of Grape Rootstocks with Broad and Durable Nematode Resistance, by Howard Ferris and M. Andrew Walker
- Developing Sustainable Control Options for the Vine Mealybug in California, by Kent Danne
- Investigation of the Grape Mealybug Complex and its Natural Enemies to Improve Biological Control, by Kent Daane and Mark Battany
- Use of Vine Mealybug Sex Pheromone for Monitoring and Mating Disruption, by Walt Bentley and Kent Daane
- Leafroll Disease Revisited, by D.A. Golino
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- Investigations Into Pathogenicity of *Phomopsis viticola* as a Cause of Cankers and Bud Death in Grapes, by George Leavitt
- Pheromones for Sampling Major Mealybug Pests in California Vineyards, by Jocelyn Millar
- Physiological Implications of Harvest Pruning Raisin Grapes, by Matthew Fidelibus
- Evaluation of Training Systems, Trellises, Row Direction, and Grape Cultivars in Dry-on-the-Vine (DOV) Raisin Production, by Matthew Fidelibus
- Evaluation of Canopy Separation and Defoliation Practices for Mechanized Raisin Harvest on traditional Trellises, by Matthew Fidelibus
- Evaluation of Nematode Resistant Rootstalks for Use with Early Ripening Raisin Varieties Grown for Dried-on-the-Vine Raisin Production, by Stephan Vasquez
- Raisin Research on DOV Using the Within Row Alternate Bearing Method (WRAB DOV), by Bill Peacock