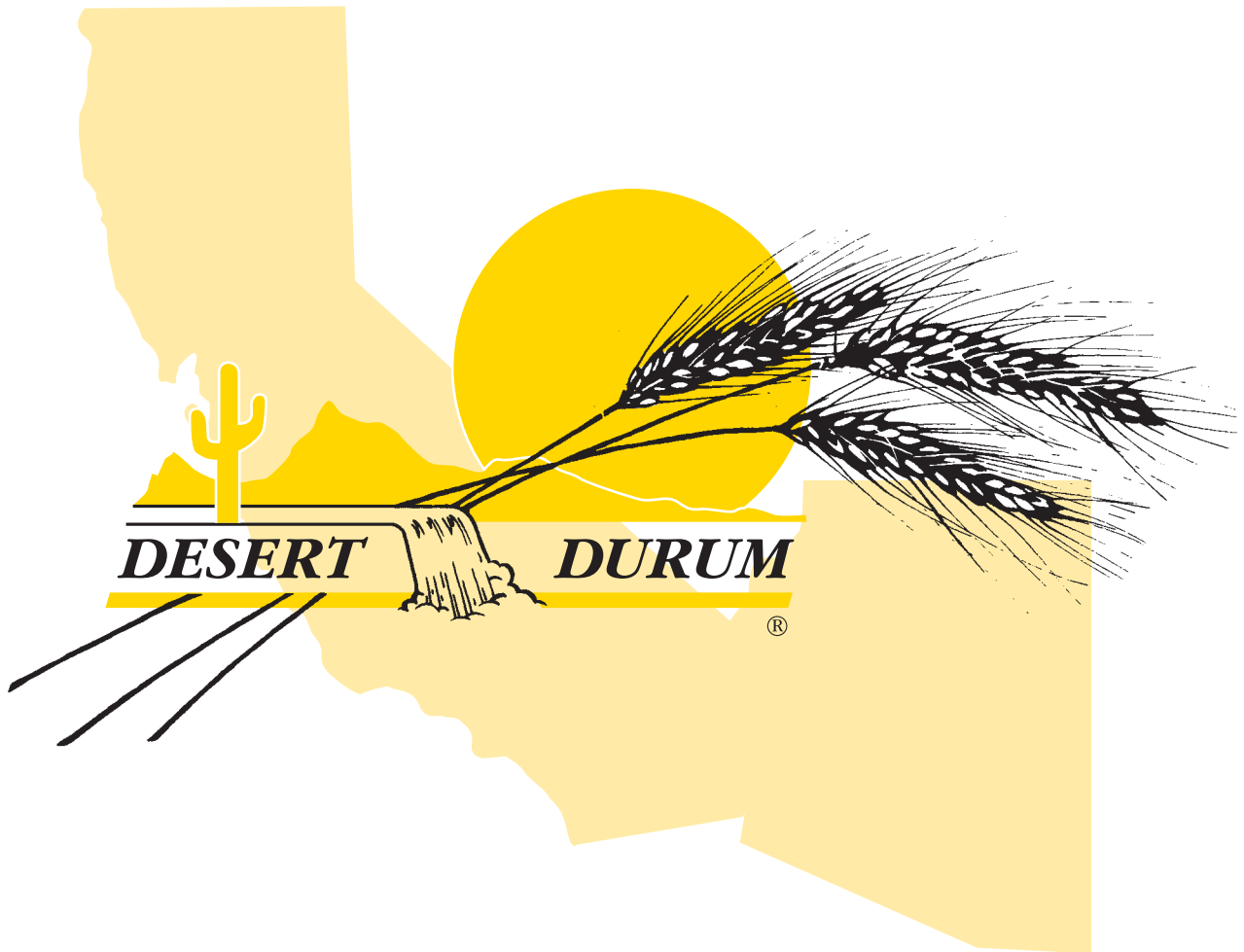

DESERT DURUM[®]

• 2003 • CROP • QUALITY •

ARIZONA / CALIFORNIA COMBINED CROP ANALYSIS



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DESERT DURUM®

The phrase "DESERT DURUM" has been trademarked with the U.S. patent office under the ownership of the Arizona Grain Research and Promotion Council and the California Wheat Commission. Only durum wheat produced in the states of Arizona and California qualifies for the DESERT DURUM® trademark.

DESERT DURUM® wheat is produced under irrigation in the desert valleys and lowlands of Arizona and California. These are regions of high temperatures (May-June temperatures average 32C) and low rainfall (annual precipitation averages less than 200 mm). DESERT DURUM® wheat is planted December through February and harvested in May and June. It enters the market up to three months ahead of the spring durum crops harvested in other North America durum-producing areas.

DESERT DURUM® wheat is usually delivered "Identity Preserved" to U.S. domestic and export markets. The identity preservation system allows buyers to purchase grain of varieties having intrinsic quality parameters specific to their needs. Annual production requirements can be contracted ahead to experienced growers using Certified seed and then "Identity" stored for season-long shipment at the buyers' schedule.

The data presented in this crop quality report are from samples that were traceable to known quantities of grain of each variety. Sampling techniques have been approved by an agricultural statistician and at least 80% of the crop was sampled. Thus, these data are intended to characterize the 2003 DESERT DURUM® crop by both variety and as an entire crop.

The milling, semolina and pasta analyses used to produce these data were conducted at the California Wheat Commission wheat quality laboratory. The laboratory staff works closely with breeding companies and buyers to provide an accurate assessment of current crop quality and breeding material.

Desert Durum® Production (Metric Tons)

Year	Arizona	California	Total
2003	312,982	312,982	625,964
2002	244,942	258,550	503,492
2001	215,468	231,471	446,939
2000	219,541	250,839	470,380
1999	194,139	231,334	425,473
1998	411,503	428,649	840,152
1997	225,259	336,115	561,374
1996	411,095	375,578	786,673

Milling, Semolina, and Pasta Characteristics of Desert Durum® Varieties

WHEAT	Alamo		Crown		Duraking		Kofa	
	'03	'02	'03	'02	'03	'02	'03	'02
Protein								
Dry (%)	15.8	15.4	15.1	14.0	14.7	14.2	16.1	15.4
As Is (%)	14.8	14.5	14.2	13.2	13.7	13.3	15.0	14.4
(12% mb)	13.9	13.6	13.3	12.3	12.9	12.5	14.2	13.6
Moisture (%)	6.2	6.1	6.3	5.6	6.3	6.4	7.0	6.4
1000 Kernel								
Weight (g)	53.4	46.0	49.3	44.6	47.2	40.0	54.0	49.7
Kernel Size Distribution								
Large (%)	96	92	91	89	88	80	95	93
Medium (%)	4	8	9	11	12	19	5	7
Small (%)	0	0	0	0	0	1	0	0
MILLING AND SEMOLINA								
Total Extraction (%)	75.2	77.8	74.9	74.8	73.2	76.6	74.3	78.8
Semolina Extraction (%)	64.6	64.7	63.3	62.9	63.1	63.8	62.8	63.6
Wheat Ash (As-Is % mb)	1.73	1.81	1.81	1.77	1.86	1.89	1.99	1.89
Semolina Ash (As-Is % mb)	0.70	0.80	0.81	0.73	0.75	0.82	0.76	0.83
Semolina Protein (As-Is % mb)	12.4	12.3	12.2	11.1	11.7	11.4	12.9	12.3
Falling Number (sec)	769	718	652	560	578	510	972	851
Specks (no/10 sq in)	9.7	2.4	5.3	9.0	6.7	10.5	7.6	15.6
Wet Gluten (%)	34.5	34.1	34.8	30.9	31.3	31.0	35.5	34.1
Dry Gluten (%)	13.0	13.1	12.7	11.7	11.1	11.3	13.2	12.7
Alveograph								
W	233.4	203.3	121.1	98.8	121.6	108.1	244.9	199.6
P/L	1.50	1.15	1.16	0.70	1.21	1.08	1.63	1.18
Color 'b' value	26.1	26.3	26.7	28.2	25.7	25.4	27.3	27.5
PASTA								
Color ¹								
Score	9.5	8.8	9.3	9.5	8.1	8.1	9.8	8.1
'b' value	41.9	41.3	41.7	41.8	38.4	38.3	43.5	42.6
Cooked Weight (g)	30.4	28.9	29.9	28.4	30.3	30.4	30.4	29.8
Cooking Loss (%)	6.9	6.5	7.5	5.8	8.3	7.6	7.3	7.2
Firmness (g/cm)	7.3	7.7	7.3	7.5	6.5	6.8	8.1	8.3

¹ Pasta and semolina color - Minolta Chromameter Model CR-200. Note: Data represent weighted means calculated to characterize the Arizona/California southwestern desert crop. Weather, soils, and cultural practices can influence the quality of all varieties between years and of particular lots of any one variety. Wheat and semolina protein - Leco Combustion Nitrogen Analyzer Model FP428.

Milling, Semolina, and Pasta Characteristics of Desert Durum® Varieties

	Kronos		Matt		Mohawk		Ocotillo		Orita		Platinum		Sky		WestBred 881	
WHEAT	'03	'02	'03	'02	'03	'02	'03¹	'02	'03	'02	'03	'03¹	'02	'03	'02	
Protein																
Dry (%)	15.1	14.5	15.6	14.2	15.5	14.8	16.1	14.5	15.8	15.2	15.3	14.7	14.2	15.7	15.0	
As Is (%)	14.0	13.5	14.6	13.3	14.4	13.8	15.0	13.6	14.7	14.2	14.4	13.7	13.3	14.6	14.1	
(12% mb)	13.3	12.8	13.7	12.5	13.6	13.0	14.2	12.8	13.9	13.4	13.5	12.9	12.5	13.8	13.2	
Moisture (%)	7.4	6.7	6.7	6.2	7.1	6.6	7.0	6.1	6.9	6.8	6.1	6.3	6.2	6.6	6.6	
1000 Kernel																
Weight (g)	54.7	49.2	49.4	44.1	55.4	44.6	48.8	45.6	55.2	48.8	39.9	48.1	42.1	48.1	49.4	
Kernel Size Distribution																
Large (%)	96	94	91	86	96	90	92	91	96	92	78	93	87	96	95	
Medium (%)	4	6	9	14	4	10	8	9	4	8	22	7	13	4	5	
Small (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
MILLING AND SEMOLINA																
Total Extraction (%)	73.2	75.5	75.5	78.6	74.6	75.9	75.2	76.0	72.7	75.7	72.8	74.2	77.4	74.6	77.9	
Semolina Extraction (%)	62.3	62.2	63.0	62.8	62.6	62.7	64.2	61.5	62.3	63.5	63.3	63.6	62.6	63.0	63.1	
Wheat Ash (As-Is % mb)	1.96	1.90	1.72	1.67	1.83	2.05	1.83	1.91	1.73	1.97	1.99	1.90	1.73	1.92	1.87	
Semolina Ash (As-Is % mb)	0.79	0.85	0.73	0.81	0.73	0.84	0.64	0.65	0.71	0.86	0.78	0.72	0.80	0.76	0.83	
Semolina Protein (As-Is % mb)	11.9	11.7	12.5	11.9	12.3	11.8	13.1	11.8	12.6	12.1	12.2	11.4	11.1	12.6	11.9	
Falling Number (sec)	644	563	729	734	611	788	624	565	726	580	716	748	574	767	676	
Specks (no/10 sq in)	9.1	17.8	9.9	26.5	7.3	21.2	1.5	22.8	6.5	19.5	5.5	6.0	11.9	10.4	20.4	
Wet Gluten (%)	32.8	31.8	34.5	32.0	34.5	31.4	38.4	32.0	34.4	32.5	31.6	30.8	29.2	34.2	32.3	
Dry Gluten (%)	12.3	12.0	12.5	11.7	12.9	12.1	14.1	11.8	12.9	11.9	11.8	11.1	11.3	12.6	12.2	
Alveograph																
W	170.6	156.5	213.8	172.4	180.6	180.0	97.2	76.5	149.3	153.0	191.6	238.4	188.6	194.4	151.9	
P/L	1.66	1.46	1.65	1.23	1.11	1.34	0.47	0.42	1.07	1.27	1.39	1.91	1.42	1.41	0.96	
Color 'b' value	26.3	25.9	27.9	27.2	28.3	28.2	25.7	23.7	26.6	25.8	30.4	27.3	26.6	25.7	25.7	
PASTA																
Color ²																
Score	9.0	8.9	9.5	9.8	9.7	9.1	9.5	9.3	9.5	8.7	9.6	10.0	9.6	9.6	9.1	
'b' value	41.2	41.4	43.6	43.7	44.6	42.2	41.4	41.0	42.6	40.6	43.7	43.5	42.7	42.2	41.1	
Cooked Weight (g)	30.3	29.7	29.8	29.7	30.6	29.9	29.5	29.7	31.0	30.0	30.6	29.8	29.1	30.0	29.2	
Cooking Loss (%)	7.9	7.2	7.7	6.9	8.3	7.0	7.7	6.9	8.0	7.2	8.4	7.5	6.9	7.8	7.1	
Firmness (g/cm)	6.7	7.4	7.6	7.4	7.1	8.2	7.7	7.5	7.0	7.6	6.8	7.5	7.5	7.4	8.0	

¹ Limited samples available for analysis; please contact the California Wheat Commission for more information. ² Pasta and semolina color - Minolta Chromameter Model CR-200. Note: Data represent weighted means calculated to characterize the Arizona/California southwestern desert crop. Weather, soils, and cultural practices can influence the quality of all varieties between years and of particular lots of any one variety. Wheat and semolina protein - Leco Combustion Nitrogen Analyzer Model FP428.

Average Grade Results

	HARVEST DATA			EXPORT CARGO DATA		
	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>00/01</u>	<u>01/02</u>	<u>02/03</u>
Protein (%) (12% MB)	13.8	13.1	13.3	----	----	----
Graded No. 1 (%)	Over 90% of samples graded No.1			100	96	95
HVAC (%)	93.0	94.5	96.2	95.0	95.2	93.4
Moisture (%)	7.2	6.2	6.7	7.1	7.0	6.8
Test Weight						
lb/bu	63.8	62.4	62.7	62.4	62.3	62.8
kg/hl	83.1	81.2	81.6	81.2	81.1	81.8
Damage (%)	0.1	0.1	0.1	1.1	0.8	0.9
*Foreign Material (%)	0.2	0.1	0.2	0.2	0.2	0.2
*Shrunken/Broken (%)	0.5	0.5	0.4	0.6	0.6	0.6
Total Defects (%)	0.8	0.7	0.7	1.9	1.6	1.7
*Dockage (%)	0.8	0.5	0.3	0.5	0.5	0.5
*Total Screenings (%)	1.5	1.1	0.9	1.3	1.3	1.3
Moisture (%)	7.2	6.2	6.7	7.5	6.9	6.8
Net Wheat (%) ¹	91.4	92.8	92.5	91.7	91.9	92.0
CTW (%) ²	108.8	110.4	110.1	109.2	109.4	109.5
MWVI ³	91.9	90.5	90.8	91.6	91.4	91.3

*Total Screenings are those factors represented on the grade certificate that are cleaned out in the flour mill. Note: Samples for the harvest data were collected through the California Department of Food and Agriculture Grain and Commodity Inspection stations in Imperial and Corcoran, California, and from the official grading stations at Yuma and Casa Grande, Arizona. Desert Durum® cargo data represents information obtained from official export inspection certificates. Test weight conversions from lb/bu to kg/hl is according to FGIS-PN-97-5, $\{(1.292 \times \text{lb/bu}) + 0.630\}$. ¹Net Wheat = $[100\% - (\text{FM} + \text{SHBN} + \text{Dockage}) \times (100\% - \text{Moisture})] / 100\%$. ² Clean, Tempered Wheat (CTW%) = $[100\% - (\text{FM} + \text{SHBN} + \text{Dockage}) \times (100\% - \text{Moisture})] / (100\% - 16\%(\text{temper moisture}))$. ³ Millable Wheat Value Index (MWVI) = $100\% / \text{CTW}$.

2003 Desert Durum® : Average Grade Results by Variety

	Alamo	Crown	Duraking	Kofa	Kronos	Matt	Mohawk	Ocotillo	Orita	Platinum	Sky	Westbred 881
Protein (%) (12% mb)	13.6	13.3	12.6	13.9	13.1	13.5	13.3	13.9	13.4	12.7	12.7	13.8
Graded No.1 (%)	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
HVAC (%)	99	96	94	99	94	98	99	99	96	96.8	98	98
Moisture (%)	6.4	5.8	6.3	6.7	7.3	6.6	7.1	7.1	6.5	6.0	5.9	6.3
Test Weight												
lb/bu	64.1	60.5	63.0	62.4	62.6	62.4	63.3	63.4	62.7	62.3	62.6	62.5
kg/hl	83.4	79.4	82.0	81.3	81.5	81.3	82.4	82.5	81.6	81.1	81.5	81.4
Damage (%)	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.3	0.2
Foreign Material (%)	0.1	0.1	0.2	0.1	0.3	0.1	0.2	0.0	0.2	0.0	0.1	0.1
Shrunken/Broken (%)	0.2	0.5	0.6	0.3	0.4	0.4	0.4	0.3	0.3	0.7	0.2	0.2
Total Defects (%)	0.4	0.6	0.8	0.5	1.0	0.5	0.5	0.3	0.6	0.8	0.5	0.5
Dockage	0.3	0.2	0.1	0.4	0.6	0.2	0.3	0.3	0.2	0.3	0.3	0.2

Note: All samples were collected through and graded by authorized Federal Grain Inspection sites. Test Weight Conversions from lb/bu to kg/hl according to FGIS-PN-97-5, $\{(1.292 \times \text{lb/bu}) + 0.630\}$. Graded No. 1 (%) reflects composite sample data. 1/. Over 90% of all samples collected through this program graded No. 1.