Arizona / California Combined Crop Analysis

2017 Desert Durum®
Crop Quality Report

ARIZONA
Grain Research & Promotion Council

California
WHEAT
COMMISSION

Desert Durum®

Desert Durum® is a registered certification mark owned by the Arizona Grain Research and Promotion Council and the California Wheat Commission, which authorize the use of the mark only to designate durum grain produced under irrigation in the desert valleys and lowlands of Arizona and California.

Desert Durum® can be produced and delivered "identity preserved" to domestic and export markets, which allows customers to purchase grain of varieties possessing quality traits specific to their needs. Annual production requirements can be pre-contracted with grain merchandisers ahead of the fall-winter planting season for harvest in late May-early July. Varietal identity is maintained by experienced growers planting certified seed and merchandisers who store and ship according to customers' preferred delivery schedules.

Desert Durum® production acreage in 2017 was less than in 2016, due largely to lower prices available at planting time. Yields were average, and quality was uniformly good. In California, varieties Orita accounted for ~ 17% and Desert King ~ 12% of all durum planted acreage in California.

Desert Durum® samples were either collected by an FGIS-licensed inspection agency or submitted by handlers to a licensed agency. In 2017, the average grade is No. 1 Hard Amber Durum (HAD). Test weight average was 62.2 lbs/bu (81.0 kg/hl). The average vitreous kernel content (HVAC) is 97.6%, a high average typical of Desert Durum®. Average damaged kernels are 0.2% and total defects are 1%. Desert Durum® is characterized by its kernel low moisture content, and this year's average was 6.6%. Protein content average was 13.5% (12% M.B.)

Desert Durum® quality performance is analyzed at the California Wheat Commission Laboratory. This year durum wheat samples were milled using a modified Buhler lab mill with identical settings and equipped with Miag laboratory purifiers at North Dakota State University Durum Wheat/Pasta Quality Lab in Fargo, North Dakota. All the semolina quality testing was performed at the Commission's lab.

Summary

Semolina color improved in 2017. The semolina b* value was 30.9, higher than both 2016 and the 5-year average of 28.6 and 27.5, respectively. Wet gluten of 33% and gluten index of 76%. Semolina Mixograph score was 7 and Alveograph W value was 266 (10^{-4} Joules), both of which indicate high strength. Pasta color b* value was 44 and score was 10, significantly higher than the 5-year average. Pasta cooked firmness was 5.5.

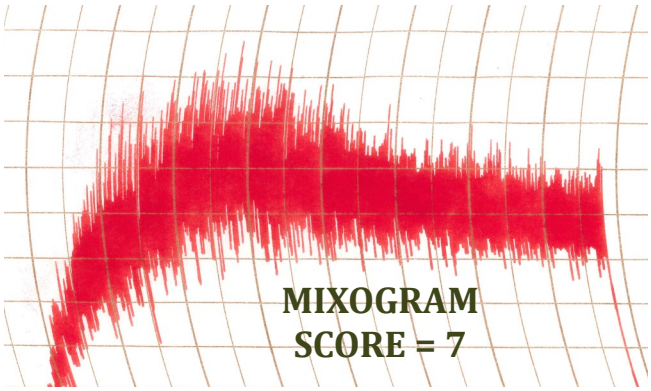
New crop grain still exhibits consistently large kernels and low moisture traits that contribute to efficient transportation costs and high extraction rates. The 2017 Desert Durum crop will deliver the valuable milling, semolina, and pasta quality traits that customers have learned to expect and appreciate.

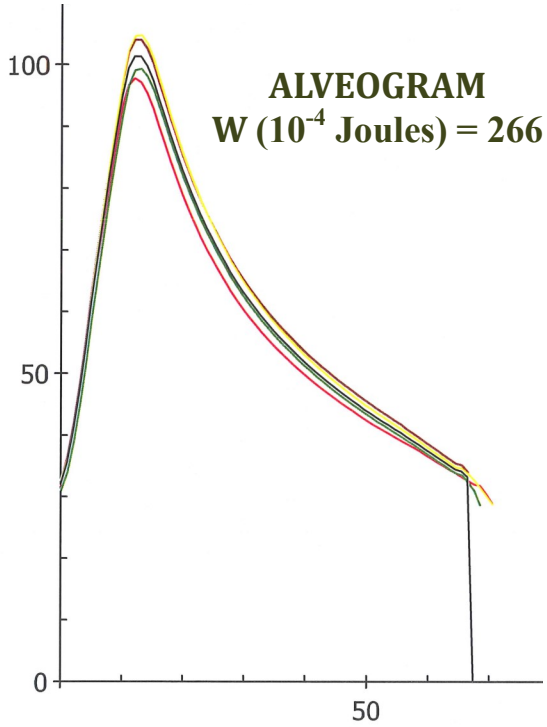
DESERT DURUM® PRODUCTION

METRIC TONS

YEAR	Arizona	California	Total
2017	230,000	35,850	265,850*
2016	313,600	66,908	380,508
2015	384,832	166,778	551,610
2014	229,593	45,260	274,853
2013	205,425	86,682	292,107
2012	268,892	280,000	548,892
2011	197,913	220,448	418,361

*California Wheat Commission estimate; final data available December 2017 from USDA.





2017 Desert Durum® Crop Quality Report

2017 DESERT DURUM® VARIETIES[1]

	Alberto	Desert King		Havasu		Miwok		Orita	
WHEAT	**2017**	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**
Protein (12% MB)	13.1	12.9	13.7	13.2	14.2	13.1	14.0	13.7	14.3
Ash (14% MB)	1.70	1.82	1.97	1.89	2.18	1.72	1.65	1.73	1.81
Moisture	7.0	6.5	7.0	5.6	6.2	7.1	7.1	6.2	6.3
Falling Number (sec)	467	475	485	731	942	547	464	707	549
Micro Sedimentation (CC)	63	59	-	58	-	49	-	57	-
Test Weight									
lb/bu	63.4	61.8	62.8	61.7	62.5	62.2	63.0	61.7	62.1
kg/hl	82.6	80.4	81.8	80.3	81.4	81.0	82.0	80.3	80.9
1000 Kernel Weight (g)	52.6	45.9	46.5	42.6	46.7	52.1	51.0	51.8	54.5
Kernel Size Distribution									
Large/Medium/Small	94/6/0	84/15/1	90/10/0	81/18/1	92/8/0	88/11/1	94/6/0	93/7/0	95/5/0
SEMOLINA									
Lab Mill Extraction (%)	76.0	75.1	76.4	74.5	76.9	76.9	77.4	74.8	75.7
Semolina Extraction (%)	70.2	70.0	63.0	68.7	62.1	72.1	63.5	68.5	61.5
Protein (14% MB)	11.8	11.5	12.6	12.1	13.3	11.9	13.2	12.3	13.4
Ash (14% MB)	0.86	0.80	0.96	0.88	0.97	0.92	0.89	0.84	0.91
Specks (no/10 sp in)	23	40	34	33	17	27	17	29	35
Wet Gluten (14% MB)	31.7	30.2	31.6	31.0	33.2	34.4	36.6	34.4	35.4
Gluten Index	87.4	62.7	59.6	86.7	89.8	33.5	34.5	60.7	63.4
Color 'b' value	32.6	26.6	25.6	31.7	28.7	26.8	25.0	29	27
MIXOGRAPH									
Absorption (%)	61.3	60.9	-	61.7	-	61.4	-	62.0	-
Peak Time (min)	3.5	3.5	-	4.0	-	2.5	-	3.0	-
Peak Height (mu)	64.0	50.0	-	53.0	-	52.0	-	48.0	-
MT Score (1-8)	8	6	-	8	-	6	-	6	-
ALVEOGRAPH									
P (mm)	98	82	60	107	136	76	55	81	117
L (mm)	83	70	68	77	69	75	57	81	84
P/L Ratio	1.2	1.2	0.9	1.4	2.0	1.0	1.0	1.0	1.4
W (10-4 joules)	278	230	120	284	319	229	96	199	196
PASTA									
Color L*	57.2	58.0	51.4	55.7	52.5	56.3	54.0	58.4	53.3
Color b*	44.8	42.5	35.7	44.3	40.2	39.7	37.1	42.6	37.5
Color Score	10.0	9.5	6.3	9.5	8.5	9.0	7.5	9.8	7.5
Cooked weight (gm)	30.5	29.8	29.9	29.8	31.2	30.8	28.3	28.3	28.8
Cooking Loss (%)	5.8	5.6	5.8	4.9	5.3	5.8	5.1	5.0	5.9
Cooked Firmness (g cm)^2	5.2	5.4	6.3	5.1	6.5	5.4	6.8	6.0	6.6

Pasta and semolina color - Minolta Chromameter Model CR-200. 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 TruSpec. [1]2017 samples are milled using a modified Buhler lab mill with identical settings and equipped with Miag laboratory purifiers at North Dakota State University Durum Wheat/Pasta Quality Lab in Fargo, North Dakota. [2]Pasta Firmness is determined using Stable Micro Systems TA.XT2 Texture Analyzer with a new pasta blade. Results cannot be compared with previous years since they were tested using different blades.

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2017 DESERT DURUM® VARIETIES[1]

	Tiburon		WB-Mead		WB-Mohave		Westmore HP	
WHEAT	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**
Protein (12% MB)	13.4	13.4	13.3	12.2	13.7	14.1	14.1	13.9
Ash (14% MB)	1.58	1.73	1.76	1.76	1.74	1.71	1.47	1.59
Moisture	5.8	7.3	5.2	6.4	5.4	6.7	5.2	6.7
Falling Number (sec)	556	529	653	711	874	650	746	548
Micro Sedimentation (CC)	60	-	56	-	66	-	65	-
Test Weight								
lb/bu	61.6	62.9	62.4	64.7	61.5	62.9	62.9	63.2
kg/hl	80.2	81.9	81.3	84.2	80.0	81.9	81.9	82.3
1000 Kernel Weight (g)	54.1	56.2	51.0	54.1	45.8	46.2	44.2	46.1
Kernel Size Distribution								
Large/Medium/Small	95/5/0	96/4/0	94/6/0	94/6/0	87/13/0	89/11/0	82/18/0	83/17/0
SEMOLINA								
Lab Mill Extraction (%)	75.2	76.5	74.4	75.1	75.8	75.6	74.1	76.8
Semolina Extraction (%)	70.5	62.7	69.7	61.7	70.4	61.3	68.6	61.6
Protein (14% MB)	12.1	12.6	12.4	11.5	12.6	13.0	12.8	13.1
Ash (14% MB)	0.84	0.91	0.83	0.88	0.77	0.82	0.66	0.78
Specks (no/10 sp in)	30	23	23	29	24	21	23	14
Wet Gluten (14% MB)	31.1	31.9	34.3	29.8	33.2	33.2	34.5	33.6
Gluten Index	92.3	80.4	55.7	73.3	86.2	92.5	67.1	78.4
Color 'b' value	31.0	27.5	29.4	29.2	32.8	31.2	32.4	30.4
MIXOGRAPH								
Absorption (%)	61.7	-	62.2	-	62.6	-	62.8	-
Peak Time (min)	3.3	-	2.5	-	3.6	-	3.0	-
Peak Height (mu)	51.0	-	47.0	-	54.0	-	53.0	-
MT Score (1-8)	7	-	6	-	8	-	7	-
ALVEOGRAPH								
P (mm)	97	112	87	116	121	123	112	147
L (mm)	72	70	70	55	80	67	67	51
P/L Ratio	1.4	1.6	1.2	2.1	1.5	1.8	1.7	2.9
W (10-4 joules)	238	245	207	218	345	288	259	279
PASTA								
Color L*	58.0	55.3	55.9	55.5	57.3	54.3	55.5	53.0
Color b*	44.4	40.6	42.5	39.7	45.0	42.3	45.1	41.1
Color Score	10.0	8.5	9.5	9.0	10.0	9.1	9.5	9.0
Cooked weight (gm)	28.4	29.2	30.5	29.2	29.0	29.4	29.5	29.4
Cooking Loss (%)	5.1	5.8	5.0	5.5	4.9	5.4	5.0	5.9
Cooked Firmness (g cm)[2]	5.3	6.0	5.5	6.1	5.3	6.3	5.8	6.3

Pasta and semolina color - Minolta Chromameter Model CR-200. 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 TruSpec. [1]2017 samples are milled using a modified Buhler lab mill with identical settings and equipped with Miag laboratory purifiers at North Dakota State University Durum Wheat/Pasta Quality Lab in Fargo, North Dakota. [2]Pasta Firmness is determined using Stable Micro Systems TA.XT2 Texture Analyzer with a new pasta blade. Results cannot be compared with previous years since they were tested using different blades.

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DESERT DURUM® AVERAGE GRADE RESULTS

	Harvest data			Export Cargo data		
	2017	2016	2015	16/17	15/16	14/15
Protein (12% MB)	13.5	13.7	13.8	13.3	13.9	13.2
Graded No. 1 (%)	Over 90% of samples graded No. 1			100	100	100
HVAC (%)	97.6	97.4	92.3	94.2	91.4	94.9
Test Weight: lb/bu	62.2	62.6	61.7	62.2	61.7	62.8
kg/hl	81.0	81.5	80.3	81.0	80.3	81.8
Moisture (%)	6.6	6.9	8.0	7.1	7.8	7.0
Damage (%)	0.2	0.2	0.4	1.0	0.6	0.4
Foreign Material* (%)	0.1	0.0	0.1	0.1	0.1	0.1
Shrunken/Broken* (%)	0.7	0.4	0.7	0.7	0.6	0.6
Total Defects (%)	1.0	0.6	1.2	1.8	1.3	1.2
Dockage* (%)	0.5	0.5	0.5	0.5	0.4	0.4
Total Screenings (%)	1.3	0.9	1.3	1.2	1.1	1.1
Net Wheat (%)	92.2	92.3	90.8	91.7	91.2	92.0
CTW (%)	109.7	109.8	108.1	109.2	108.5	109.5
MWVI (%)	91.2	91.1	92.5	91.6	92.2	91.3

*Total Screenings are those factors represented on the grade certificate that are cleaned out in the flour mill. Samples were either official samples collected by a licensee of FGIS or submitted by handlers to a licensee for grading. Desert Durum® cargo data represents information obtained from official export inspection certificates. Test weight conversion from lb/bu to kg/hl according to FGIS-PN-97-5, (1.292 x lb/bu) + 0.630. Net Wheat = (100%-(FM+SHBN+Dockage)) x (100%-Moisture)/100%. Clean, Tempered Wheat (CTW%) = (100%- (FM +SHBN+Dockage)) x (100%-Moisture)/(100%-16% (temper moisture)). Millable Wheat Value Index (MWVI) = 100%/CTW.

2017 DESERT DURUM® AVERAGE GRADE RESULTS BY VARIETY

WHEAT	Alberto	Desert King	Havasu	Miwok	Orita	Tiburon	WB-Mead	WB-Mohave	Westmore HP
Protein (12%mb)	13.1	12.5	13.2	13.4	13.6	13.4	13.4	13.7	14.0
Graded No. 1 (%)	Over 90% of samples graded No. 1								
HVAC (%)	98.0	97.3	99.0	98.0	96.8	95.0	98.0	98.9	99.0
Moisture (%)	8.3	7.1	6.1	7.5	6.7	6.8	6.2	6.3	6.3
Test Weight: lb/bu	63.1	61.4	62.8	62.4	61.7	62.2	63.2	62.4	63.3
kg/hl	82.2	80.0	81.8	81.3	80.3	81.0	82.3	81.3	82.4
Damage (%)	0.4	0.0	0.0	0.0	0.3	0.5	0.0	0.0	0.0
Foreign Material (%)	0.0	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0
Shrunken/Broken (%)	0.2	1.8	1.6	1.4	0.7	0.3	0.5	0.6	0.3
Total Defects (%)	0.6	2.0	1.7	1.6	1.1	0.9	0.5	1.0	0.3
Dockage (%)	0.2	1.0	0.2	0.9	0.5	0.6	0.2	0.4	0.2

Samples were either official samples collected by a licensee of FGIS or submitted by handlers to a licensee for grading. Test weight conversions from lb/bu to kg/hl according to FGIS-PN97-5, (1.292 x lb/bu) + 0.630.

Technical and Laboratory Services

CWC Executive Director Claudia Carter and Laboratory Manager Teng Vang
Photo credit: Matt Salvo, California Farm Bureau Federation

The California Wheat Commission laboratory has the equipment necessary for evaluation of common and durum wheat milling quality, flour chemical analysis, physical dough testing, semolina analysis, bake and noodle production tests, and pasta analysis.

The Commission's staff is available to work with customers in the area of quality assurance, product development, problem solving, quality control training, and research. The lab order test form is available on the California Wheat Commission website, please use when requesting services.

Customer Assistance and Support

The Commission is available to answer technical questions about California's wheat quality, including recommendations for blending and appropriate end-use. The Commission conducts specialized training programs in milling, baking, semolina, pasta, and quality control. These specific programs may be customized to meet the customers' needs.

Crop and Export Survey

California produces five of the six classes of U.S. wheat: Hard Red Winter (HRW), Desert Durum®, Hard White, Soft White and Hard Red Spring. While HRW, Hard White, and Durum are the predominately produced and exported classes, information and contacts for all the above classes of wheat are available by contacting the Commission office. Every effort is made to provide an accurate assessment of quality to buyers. With greater amounts of wheat being sold by variety, varietal specific information is emphasized in Commission surveys.

Varietal Development

Private and public breeding programs play an important role in the development of new varieties available to California wheat producers. The Commission analyzes hundreds of samples each year to support these programs and encourages the release of new varieties that will meet the customers' needs. New varieties are evaluated by commercial mills through the California Wheat Collaborator program.

Research

The Commission laboratory is available for flour, semolina, milling, end-product, and new-product research. Technical expertise is available in hearth breads, pasta, Asian food products, standard loaf bread, steamed bread, Asian noodles, cookies, tortillas and Middle Eastern flat breads.

CWC Laboratory Manager Teng Vang
Photo credit: Matt Salvo, California Farm Bureau Federation

Notes:

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