

~ 2017 ~

U.S. Sunflower Crop Quality Report



Regarding the 2017 Sunflower Crop Quality Report . . .

The 2017 U.S. Sunflower Crop Quality Report, compiled by the National Sunflower Association in cooperation with the Foreign Agricultural Service, U.S. Department of Agriculture, provides an overview on the size and quality of the 2017 U.S. sunflower seed crop. It includes statistics on the marketing of the crop, as well as U.S. and world supply/disappearance tables and information on U.S. sunflower oil.

Produced annually by the National Sunflower Association since 1981, this newest U.S. Sunflower Crop Quality Report can be found on the NSA's website. Address: www.sunflowernsa.com. Printed copies of this report can be made available by the NSA. (See NSA's contact details on page 9).

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2017 U.S. Sunflower Acreage & Production

United States sunflower production totaled nearly 2.17 billion pounds in 2017, down 18+% from the 2016 crop's size and about 25% below that of 2015.

The U.S. average yield in 2017 — 1,613 pounds per acre — was 118 pounds below the record yield produced in 2016. The 2017 yield was the third highest on record and was achieved despite drought conditions in the Dakotas.

South Dakota, the top sunflower-producing state during 2017, produced 1.04 billion pounds, down 2% from 2016. Compared with 2016, planted area in South Dakota increased 11%, but yield decreased 208 pounds to 1,750 pounds per acre.

North Dakota produced 697 million pounds of sun-

flower in 2017, down nearly 39% from 2016.

United States production of nonoil sunflower varieties in 2017 was estimated at 312 million pounds, an increase of 10% from 2016. Area harvested, at 172,700 acres, was up 6% from 2016. The average nonoil yield increased by 75 pounds from 2016 to 1,804 pounds per acre — the second highest nonoil yield on record.

Production of oil-type sunflower varieties in 2017, at 1.86 billion pounds, was down 22% from 2016. Compared with the previous year, oil-type harvested acreage was 14% lower, with the average yield decreasing by 146 pounds compared with 2016, ending up at 1,585 pounds per acre.



U.S. Sunflower Production

(1,000s of Pounds)

	2014	2015	2016	2017
Oil	1,664,090	2,383,870	2,369,015	1,857,105
Nonoil	554,960	539,860	282,620	311,632
Total	2,219,050	2,923,730	2,651,635	2,168,737

U.S. Oil-Type Sunflower Harvested Area, By State

(1,000s of Hectares)

State	2010	2011	2012	2013	2014	2015	2016	2017
Colorado	37.2	39.3	24.7	15.8	13.0	23.1	23.1	29.9
Kansas	42.5	42.5	26.3	20.2	17.0	21.4	17.0	20.2
Minnesota	20.6	10.9	15.0	13.0	18.2	30.4	25.9	13.4
Nebraska	9.7	14.2	11.9	10.3	10.1	10.9	11.3	11.5
North Dakota	277.2	202.3	305.5	163.9	206.4	244.8	246.9	155.4
South Dakota	161.9	163.1	226.6	218.5	161.9	230.7	200.3	210.4
Texas	11.3	9.3	13.4	24.3	16.2	35.2	11.3	12.1
Other	15.1	17.6	20.8	23.6	18.3	14.6	18.0	21.4
Total	575.5	499.2	644.2	489.6	461.1	611.1	553.8	474.3

2017 Seed Quality/Confection Kernel Specifications

Seed quality and kernel specifications of the 2017 crop were estimated from samples of oil and nonoil (confection) sunflower collected with the aid of the North Dakota Grain Inspection Service, Kansas Grain Inspection Service, Aberdeen (S.D.) Grain Inspection and several confection sunflower processing plants. The samples were drawn from sunflower loads delivered to processors, or from submitted samples taken at local grain buying facilities. The seed samples were then analyzed according to USDA Grain Inspection, Packers &

Stockyards Administration (GIPSA, formerly known as FGIS) directives. Oil content of oil-type seed samples was determined on a clean-seed basis using nuclear magnetic resonance (NMR) analysis.

Analysis of the oil-type sunflower seed samples indicated an average oil content of 41.6%, down from the 2016 average of 43.2%. Test weight averaged 30.0 pounds per bushel — 1.0 pounds below the 2016 samples. Foreign material, at 5.1%, was 0.7% higher than the 2016 average of 4.4%. Moisture, at 9.1%, was up slightly from the average of the 2016 samples.

The percentage of confection (nonoil) seeds over 20/64 in size averaged 87.1% among the 2017 samples, compared to the 2016 average of 82.4%.

Foreign material in the nonoils averaged 16.3% in 2017, which was 4.0%

above the 2016 average. At 20.2 pounds per bushel, average 2017 nonoil test weight was 0.1 pound higher than that of the 2016 samples. At 9.8%, moisture was slightly above the 9.6% average of the 2016 crop.

Oil-Type Sunflower Seed Quality

Year	Test Weight (Lbs/Bu)	Moisture (%)	Foreign Material (%)	Oil (%)
2017	30.0	9.1	5.1	41.6
2016	31.0	8.8	4.4	43.2
2015	31.0	8.6	5.4	42.5
2014	30.1	8.6	5.6	41.5
2013	30.1	10.0	5.0	41.9

Nonoil Sunflower Seed Quality

Year	Test Weight (Lbs/Bu)	Moisture (%)	Foreign Material (%)	Seeds Over 20/64 Size (%)
2017	20.2	9.8	16.3	87.1
2016	20.1	9.6	12.3	82.4
2015	20.6	9.7	12.8	84.8
2014	21.0	9.3	11.6	79.7
2013	22.0	11.6	7.3	85.4

Product Specifications U.S. Sunflower Kernel

- Origin** - Sunflower hybrid seed
 - Flavor** - Good, typical, mild, distinctive
 - Odor** - Good, clean, fresh aroma
 - Texture** - Firm, not brittle or soggy
 - Color** - Off-white, gray
 - Microbiological** - Aflatoxin: Negative
Pathogens: Negative
 - Chemical Additives** - No preservatives or chemical additives may be used
 - Pesticide Residues** - Meets all state & federal regulatory requirements
 - Fumigants** - Only FDA-approved fumigants may be used as considered necessary. Residues may not exceed FDA approved tolerances
- Quality and type of kernel is determined with the following factors to meet specific customer needs:*
- Size** - Defined as kernel count per oz
 - Foreign Material** - Includes shells and unshelled seed; defined as percentage or count per unit of weight
 - Moisture** - Defined as a percentage at or below 8%
 - Damage** - Distinctly discolored kernel or insect damage. Each defined as a percentage
 - Broken or Chip** - Any portion less than 1/2 kernel; defined as a percentage
 - Sticktites** - Kernel with a piece of shell adhering; defined as count per unit of weight.

2017 Oil Quality Analysis/Oil Traits & Rules

The tables below compare the oil quality and fatty acid content of representative samples of high-oleic and mid-oleic sunflower seed oil, gathered from the 2017 U.S. crop, to previous years' data on oil quality. The sunflower oil quality analysis was conducted with standard gas chromatography, basis American Oil Chemists' Society Method #Cel-62.

The 70.67% oleic average of 2017 NuSun® (mid-oleic) samples was well above the 66.06% and 63.77% of the 2016 and 2015 crops, respectively.

The 2017 high-oleic seed samples averaged an oleic acid content of

86.37%. That compares to an 85.60% average of the 2016 high-oleic seed samples and 84.23% in 2015.

As is the case each year, climatic factors and timing of production contributed to the fatty acid levels of both the NuSun and high-oleic samples collected at harvest.

See general trading rules for mid-oleic and high-oleic oil, as well as product specification tables, at www.sunflowernsa.com.

Click on the link "Sunflower oil," then "product specifications." For more details or questions regarding trading rules, go to the American Fats & Oils Assn., Inc., website: afoaonline.org.

Sunflower Oil Quality / High Oleic

Percent

Year	Palmitic 16:0	Stearic 18:0	Oleic 18:1	Linoleic 18:2	Linolenic 18:3
2017	3.27	3.11	86.37	4.86	0.17
2016	3.43	3.17	85.60	5.51	0.19
2015	3.47	3.20	84.23	6.70	0.27
2014	3.62	3.09	85.52	5.38	0.30
2013	3.72	3.29	85.87	4.96	0.18

Sunflower Oil Quality / NuSun®

Percent

Year	Palmitic 16:0	Stearic 18:0	Oleic 18:1	Linoleic 18:2	Linolenic 18:3
2017	3.97	3.34	70.67	19.51	0.26
2016	4.13	3.57	66.06	23.80	0.40
2015	4.25	3.56	63.77	26.02	0.36
2014	4.14	3.20	67.23	22.98	0.43
2013	4.41	3.72	66.17	23.44	0.28

Mid-Oleic Sunflower Oil (NuSun®): Crude

Trading Rules: Specifications from American Fats and Oils Association: Rule 14B

ITEM	VALUE
Flash Point (AOCS Cc 9b-56)	250°F Minimum
Halphen Test	Negative
Saponification Value	188-194
Unsaponifiable	1.3% Maximum
Free Fatty Acid (as Oleic)	Basis 2.0% Maximum 3.0%
Moisture & Volatile (AOCS Ca 2d-25)	0.5% Maximum
Insoluble Impurities (AOCS Ca 3-46)	0.3% Maximum
Color (in 5 1/4 inch cell or tube), as determined under AOCS Method Cc 13b-45, Bleached (AOCS Cc 8g-52), after refining (AOCS Ca 9a-52)	2.5 Red Maximum
Linolenic acid	1.0% Maximum
Oleic (as % of TFA)	55% Minimum 75% Maximum

Rule 14B -- Crude mid-oleic sunflower oil (NuSun®) shall be pure and produced only from sunflower seed of fair average quality by hydraulic, expeller, or solvent extraction process. Buyer shall receive an allowance of 0.1% of the invoice value for each 0.1% of free fatty acid in excess of 2%; fractions in proportion. (Effective 1/1/2003)

Mid-Oleic Sunflower Oil (NuSun®): Fully Refined, Bleached & Deodorized

Trading Rules: Specifications from American Fats and Oils Association: Rule 15B

ITEM	VALUE
Free Fatty Acid (as Oleic)	0.05% Maximum
Moisture & Impurities (AOCS Ca 2d-25)	0.10% Maximum
Peroxide Value	2.0 Maximum
Color (Lovibond Scale)	2.5 Red Maximum
Iodine Value	88-115.0
Oleic	55% Minimum 75% Maximum
Flavor	Pleasing
Appearances (Waxes Not Separated)	Will be cloudy at room temperature

Other Possible Specs:

Saponification Value	186-194
Unsaponifiable	1.5% Maximum
Specific Gravity by 20° Centigrade	0.917-0.924

Rule 15B -- Fully refined, bleached and deodorized mid-oleic sunflower oil (NuSun®) shall be pure mid-oleic sunflower seed oil. It shall be produced from fair average quality crude mid-oleic sunflower seed oil from which essentially all of the free fatty acids and non-oil substances have been removed by chemical treatments and by mechanical or physical separation. (Effective 1/1/2003)

2017 Sunflower Oil & Sunflower Meal Exports

Oil Exports - Sunflower oil is the preferred oil in most of Europe, Russia and Mexico, as well as in countries along the Mediterranean and several South American nations.

U.S. sunflower oil exporters can deliver three types of sunflower oil: NuSun®, Linoleic and High Oleic.

- **NuSun®** is a mid-range oleic, 55%-75% (monounsaturated) sun-

flower oil. It needs no hydrogenation and has a 9% saturated fat level. NuSun® is extremely functional for frying applications and has a good balance of linoleic acid — an essential fatty acid that enhances products' taste.

- **Linoleic** sunflower oil has about 69% polyunsaturated fat, 20% monounsaturated fat and 11% saturated fat. Linoleic sunflower is an excellent cooking oil with a neutral taste. This enhances the taste of food rather than overpowering it.

- **High-Oleic** sun-

flower oil has 80% or more oleic (monounsaturated) acid. This unique oil has many specialty applications.

Sun Meal Exports - Most of U.S. sunflower meal produced is utilized within the United States as an ingredient for the domestic livestock feeding industry, although some U.S. sunflower meal is exported. Four types of sun meal, identified by their respective protein contents (28, 30, 32 and 35%), are produced in the United States.

U.S. Sunflower Oil Exports

(October-September, in Metric Tons)

Country	2013/14	2014/15	2015/16	2016/17
Australia	910	148	77	51
Canada	16,652	18,944	18,996	17,869
Columbia	2	12	534	2,694
Costa Rica	519	191	82	36
Germany	2,000	0	0	2
Japan	2,575	4,384	4,442	2,530
Mexico	4,654	3,326	10,721	4,874
Netherlands	2,445	178	303	258
Singapore	146	33	4	0
South Korea	900	63	170	152
Taiwan	45	515	650	1,066
United Kingdom	4,094	0	15	12
Vietnam	1,390	388	692	388
Other	852	763	2,134	2,528
Total MT	37,184	28,945	38,820	32,460

U.S. Sunflower Meal Exports

(October-September, in Metric Tons)

Country	2013/14	2014/15	2015/16	2016/17
Canada	4,328	4,370	3,781	3,503
Germany	1,036	0	0	0
Israel	0	0	0	0
Indonesia	76	2,750	406	0
Mexico	0	0	1,070	300
Romania	2,012	0	0	0
Thailand	0	0	5,139	288
Venezuela	0	0	1,177	0
Other	261	312	200	13
Total MT	7,713	7,432	11,773	4,104



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U.S. Sunflower Supply & Disappearance *(in 1,000 Metric Tons, Unless Specified)*

Item	2012/13	2013/14	2014/15	2015/16	2016/17 <i>Revised</i>	2017/18 <i>Forecast</i>
NONOIL SUNFLOWER						
Area Harvested (1,000 HA)	101	107	150	117	66	70
Area Harvested (1,000 AC)	249	264	371	289	164	173
Yield (MT/HA)	1.74	1.63	1.68	2.09	1.94	2.02
Yield (LB/AC)	1,548	1,458	1,497	1,865	1,729	1,804
Stocks, Oct. 1	28	23	31	72	71	39
Production	175	174	252	245	129	141
Seed Import	25	28	37	35	36	35
TOTAL SUPPLY	228	226	320	351	236	215
Disappearance	205	195	248	280	197	190
Ending Stocks	23	31	72	71	39	25
OIL SUNFLOWER						
Area Harvested (1,000 HA)	644	486	461	611	554	474
Area Harvested (1,000 AC)	1,592	1,201	1,140	1,510	1,369	1,172
Yield (MT/HA)	1.69	1.53	1.64	1.77	1.94	1.78
Yield (LB/AC)	1,508	1,363	1,460	1,579	1,731	1,585
Stocks, Oct. 1	30	165	15	34	106	186
Production	1,089	743	755	1,082	1,075	843
Seed Import	25	27	23	18	21	20
TOTAL SUPPLY	1,144	935	793	1,134	1,201	1,049
Oilseed Crushed	467	470	351	495	508	480
Planting Seed, Birdfood, Domestic Use	478	420	375	512	483	445
Exports	34	30	33	21	24	25
Disappearance	979	920	759	1,028	1,015	950
Ending Stocks	165	15	34	106	186	99
SUNFLOWER OIL						
Stocks, Oct. 1	17	19	17	21	34	41
Oil Imports	33	35	80	42	55	50
Oil Production	194	195	146	205	211	199
TOTAL SUPPLY	244	249	243	268	300	290
Domestic Oil Use	196	195	194	195	227	232
Oil Exports	29	37	29	39	32	30
Total Use	225	232	223	234	259	262
Ending Stocks	19	17	20	34	41	28
SUNFLOWER MEAL						
Stocks, Oct. 1	2	2	4	3	3	3
Production	238	240	179	252	259	245
TOTAL SUPPLY	240	242	183	255	262	248
Domestic Use	219	230	173	240	255	241
Exports	19	8	7	12	4	4
Total Use	238	238	180	252	259	245
Ending Stocks	2	4	3	3	3	3

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World Sunflower Supply & Disappearance

Sources:
Oil World & USDA

Item	2012/13	2013/14	2014/15	2015/16	2016/17 <i>Revised</i>	2017/18 <i>Forecast</i>
Area Harvested (1,000 HA)	25,470	25,730	24,708	25,242	26,923	27,703
Yield (MT/HA)	1.40	1.68	1.67	1.70	1.86	1.75
SUNFLOWER SEED —						
Production						
Argentina	2,850	2,250	3,000	2,830	3,300	3,700
European Union	7,018	9,105	9,006	7,769	8,545	9,544
China	1,730	2,423	2,380	2,698	2,750	2,800
Russia	8,000	10,200	9,000	9,700	11,700	10,800
Ukraine	8,387	10,941	10,250	12,100	15,100	13,200
United States	1,264	917	1,005	1,326	1,203	984
India	615	580	390	755	875	800
Turkey	1,100	1,450	1,350	1,350	1,470	1,700
Other	4,783	5,471	4,953	4,386	5,110	5,024
TOTAL	35,747	43,337	41,334	42,914	50,053	48,552
Seed Import						
Turkey	627	581	523	436	611	600
European Union	220	329	275	577	632	360
Other	638	1,050	1,078	1,100	1,411	1,491
TOTAL	1,485	1,960	1,876	2,113	2,654	2,451
Seed Exports						
Argentina	85	80	63	302	74	60
United States	144	132	126	107	99	90
Russia	59	131	61	105	362	180
Ukraine	124	71	123	171	261	160
Other	1,128	1,536	1,462	1,467	1,826	1,988
TOTAL	1,540	1,950	1,835	2,152	2,622	2,478
Oilseed Crushed	32,355	38,360	36,581	38,177	44,878	43,722
SUNFLOWER OIL —						
Oil Opening Stocks	1,926	1,645	1,989	1,972	1,974	2,429
Oil Production	13,554	16,102	15,854	15,936	18,896	18,337
Oil Imports						
Iran	197	306	329	205	586	440
Turkey	656	773	789	766	801	700
Egypt	643	777	299	329	584	470
European Union	936	1,128	882	1,530	1,867	1,600
India	939	1,578	1,531	1,533	2,137	2,220
Others	2,894	3,644	3,486	3,989	4,473	4,260
TOTAL	6,265	8,206	7,316	8,352	10,448	9,690
Oil Exports						
Argentina	612	435	443	630	728	830
European Union	235	367	411	369	454	481
Russia	1,088	1,810	1,406	1,611	2,223	2,050
Ukraine	3,120	4,280	3,734	4,602	5,892	5,100
United States	29	37	29	39	32	30
Other	1,101	1,359	1,231	1,212	1,347	1,254
TOTAL	6,185	8,288	7,254	8,463	10,676	9,745
Disappearance	13,895	15,758	15,327	15,824	18,214	18,357
Ending Stocks	1,585	1,989	1,903	2,084	2,656	2,409
SUNFLOWER MEAL —						
Meal Production	15,033	17,492	16,634	17,082	19,922	19,630
Meal Imports	5,465	6,300	5,841	6,309	7,469	6,889
Meal Exports	5,450	6,360	5,854	6,339	7,484	6,904
Disappearance	15,120	17,450	16,688	17,076	19,812	19,643
Ending Stocks	318	293	251	227	321	292

About the National Sunflower Association

The National Sunflower Association (NSA) is a nonprofit organization dedicated to the promotion of U.S. sunflower and its products, and to the development of sunflower markets throughout the world.

Based in the central North Dakota city of Mandan, NSA was incorporated in 1981. It is funded and governed by U.S. sunflower growers and industry representatives. Agreements with the U.S. Department of

Agriculture's Foreign Agricultural Service provide funding for overseas market development programs, including this publication.

Among the many NSA programs and activities are the following:

- Developing and distributing technical literature on sunflower refining and nutrition.
- Providing technical assistance to foreign companies on oil refining and finished product manufacture; also, providing tech-

nical aid to U.S. confection sunflower customers.

- Producing and distributing a variety of literature pertaining to sunflower markets, the U.S. sunflower crop and sunflower products, including *The Sunflower* magazine, which is published six times annually

- Researching the marketplace and surveying consumer awareness of (and attitudes toward) sunflower products.

- Conducting industrial research abroad, including

confection shelf-life and other utilization studies.

- Hosting foreign marketing and technical personnel, arranging meetings with U.S. sunflower industry representatives, setting up tours of U.S. processing and research facilities, and coordinating educational seminars for the benefit of foreign visitors.

The National Sunflower Association welcomes inquiries from any foreign agencies, companies or individuals interested in U.S. sunflower.

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U.S. Sunflower Information Online

The National Sunflower Association has a wealth of U.S. sunflower information online at www.sunflowernsa.com.

This web site provides international marketing information, product specifications, and a list of sunflower product suppliers.

Click on the "Buyers and Sellers" link for a list of sunflower product suppliers and buyers.

The "Sunflower oil" link provides more detailed information on sunflower oil.

Use the "Sunflower seed/kernel" link if you require information about confection sunflower seeds and kernel.

***NSA is an equal opportunity
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