

~ 2020 ~

U.S. Sunflower Crop Quality Report



Regarding the 2020 Sunflower Crop Quality Report . . .

The 2020 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 2020 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 at www.sunflowernsa.com.

Printed copies of this report can be made available upon request by the NSA. (See the NSA's contact details on page 9).

— Table of Contents —

Regarding the 2020 Report	2
2020 Acreage & Production	3
Seed Quality / Confection Kernel Specifications	4
Oil Quality Analysis / Oil Traits & Rules	5
Sun Oil & Sun Meal Exports	6
U.S. Supply & Disappearance	7
World Supply & Disappearance	8
About the National Sunflower Association / Contact	9



2020 U.S. Sunflower Acreage & Production

United States sunflower production totaled 2.98 billion pounds in 2020 according to USDA, up 52% from 2019. The average yield of 1,790 pounds/acre increased by 230 pounds from 2019 — and is a new record high average yield for the nation.

Planted area, at 1.72 million acres, was 27% above the previous year. Area harvested was up 33% from 2019 to 1.67 million acres.

North Dakota, the leading sunflower-producing state during 2020, harvested 1.34 billion pounds, up 79% from 2019. Compared with 2019, planted area in North Dakota increased 37% and yield was up 356 lbs to 1,872 pounds/acre

Production in South Dakota increased 40% from 2019 to 1.17 billion

pounds. Planted acreage in South Dakota, at 622,000 acres, increased 17% from the previous year. The average yield in South Dakota increased by 216 pounds from 2019 to 1,910 pounds/acre

United States production of oil-type sunflower varieties in 2020, at 2.62 billion pounds, grew 48% from 2019. Compared with the previous year, harvested acres were up 28% and the average yield increased by 241 pounds to 1,802 pounds/acre — a record high.

Production of nonoil sunflower in 2020 is estimated at 365 million pounds, an increase of 92% from 2019. Area harvested, at 213,200 acres, was up 74% from 2019. The average nonoil yield increased by 157 pounds from 2019, up to 1,712 pounds/acre.



U.S. Sunflower Production

(1,000s of Pounds)

	2017	2018	2019	2020
Oil	1,847,525	1,877,260	1,765,550	2,617,340
Nonoil	290,225	219,785	190,485	365,070
Total	2,137,750	2,097,045	1,956,035	2,982,410

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

(1,000s of Hectares)

State	2013	2014	2015	2016	2017	2018	2019	2020
Colorado	15.8	13.0	23.1	23.1	29.9	19.8	17.8	13.0
Kansas	20.2	17.0	21.4	17.0	20.2	16.6	14.2	21.0
Minnesota	13.0	18.2	30.4	25.9	13.4	17.8	20.6	27.1
Nebraska	10.3	10.1	10.9	11.3	11.5	9.7	10.5	15.8
North Dakota	163.9	206.4	244.8	246.9	155.4	153.8	178.1	255.0
South Dakota	218.5	161.9	230.7	200.3	210.4	196.3	186.2	226.6
Texas	24.3	16.2	35.2	11.3	12.1	7.7	10.5	12.1
Other	23.6	18.3	14.6	18.0	21.4	23.1	19.8	17.2
Total	489.6	461.1	611.1	553.8	474.3	444.8	457.7	587.8

2020 Seed Quality/Confection Kernel Specifications

Seed quality and kernel specifications of the 2020 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 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)

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 42.2%, compared to the 2019 average of 42.6%. Test weight averaged 29.0 pounds per bushel — 0.5 pound below the 2019 samples. Foreign material, at 4.4%, was 1.2% lower than the 2019 average of 5.6%. At 9.1%, moisture was 1.8% below the average of the 2019 samples.

The percentage of con-

fection (nonoil) seeds over 20/64 in size averaged 80.2% among the 2020 crop year samples, compared to the 2019 average of 80.6%.

Foreign material in the nonoils averaged 12.2% in 2020, which was 0.8%

below the 2019 average.

At 21.1 pounds per bushel, average 2020 nonoil test weight was 0.6 pounds lower than that of the 2019 samples.

At 8.9%, moisture was 0.6% below the average of the 2019 nonoil crop.

Oil-Type Sunflower Seed Quality

Year	Test Weight (Lbs/Bu)	Moisture (%)	Foreign Material (%)	Oil (%)
2020	29.0	9.1	4.4	42.2
2019	29.5	10.9	5.6	42.6
2018	30.4	9.1	3.6	42.8
2017	30.0	9.1	5.1	41.6
2016	31.0	8.8	4.4	43.2

Nonoil Sunflower Seed Quality

Year	Test Weight (Lbs/Bu)	Moisture (%)	Foreign Material (%)	Seeds Over 20/64 Size (%)
2020	21.1	8.9	12.2	80.2
2019	21.7	9.5	13.0	80.6
2018	22.3	10.3	12.7	86.4
2017	20.2	9.8	16.3	87.1
2016	20.1	9.6	12.3	82.4

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.

2020 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 2020 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 68.84% oleic average of 2020 NuSun® (mid-oleic) samples was below the 70.19% average of the 2019 crop and also lower than 2018's 70.04%.

The 2020 high-oleic seed samples averaged an oleic acid content of

84.26%. That compares to an 85.21% average of the 2019 high-oleic seed samples and 85.04% in 2018.

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

	Palmitic	Stearic	Oleic	Linoleic	Linolenic
Year	16:0	18:0	18:1	18:2	18:3
2020	3.28	3.39	84.26	6.76	0.22
2019	3.38	3.39	85.21	5.85	0.21
2018	3.37	3.37	85.04	6.09	0.12
2017	3.27	3.11	86.37	4.86	0.17
2016	3.43	3.17	85.60	5.51	0.19

Sunflower Oil Quality / NuSun®

Percent

	Palmitic	Stearic	Oleic	Linoleic	Linolenic
Year	16:0	18:0	18:1	18:2	18:3
2020	3.95	3.48	68.84	21.39	0.38
2019	3.99	3.38	70.19	20.32	0.27
2018	4.06	3.55	70.04	19.89	0.32
2017	3.97	3.34	70.67	19.51	0.26
2016	4.13	3.57	66.06	23.80	0.40

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)

2020 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	2016/17	2017/18	2018/19	2019/20
Australia	51	492	1,511	646
Canada	17,869	20,282	20,402	23,716
Columbia	2,694	7	109	133
Costa Rica	36	354	0	0
Germany	2	6	4,569	1
Japan	2,530	597	1,104	567
Malaysia	0	2,083	6,721	48
Mexico	4,874	12,572	17,015	9,686
Netherlands	258	224	35	166
Singapore	0	41	153	1
South Korea	152	236	157	2,261
Taiwan	1,066	611	616	501
Vietnam	388	1,230	1,415	63
Other	2,540	1,649	1,613	1,898
Total MT	32,460	40,384	55,420	39,687

U.S. Sunflower Meal Exports

(October-September, in Metric Tons)

Country	2016/17	2017/18	2018/19	2019/20
Canada	3,503	3,006	13,206	19,817
Costa Rica	0	38	0	0
Indonesia	0	194	155	0
Mexico	300	35	0	0
Thailand	288	0	834	0
Vietnam	0	2,550	156	41
Other	13	0	0	103
Total MT	4,104	5,823	14,351	19,961



2020 U.S. Sunflower Crop Quality Report 7

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

Item	2015/16	2016/17	2017/18	2018/19	2019/20 <i>Revised</i>	2020/21 <i>Forecast</i>
NONOIL SUNFLOWER						
Area Harvested (1,000 HA)	117	66	67	50	50	86
Area Harvested (1,000 AC)	289	164	166	123	123	213
Yield (MT/HA)	2.09	1.94	1.96	2.00	1.74	1.92
Yield (LB/AC)	1,865	1,729	1,750	1,781	1,555	1,712
Stocks, Oct. 1	71	71	38	49	32	25
Production	245	129	132	100	86	166
Seed Import	35	36	41	50	98	50
TOTAL SUPPLY	351	236	211	199	216	241
Disappearance	280	197	162	167	191	200
Ending Stocks	71	39	49	32	25	41
OIL SUNFLOWER						
Area Harvested (1,000 HA)	611	554	473	443	458	588
Area Harvested (1,000 AC)	1,510	1,369	1,168	1,094	1,131	1,452
Yield (MT/HA)	1.77	1.94	1.77	1.93	1.75	2.02
Yield (LB/AC)	1,579	1,731	1,582	1,725	1,561	1,802
Stocks, Oct. 1	34	105	187	97	65	57
Production	1,082	1,075	838	856	801	1,187
Seed Import	18	21	31	36	43	30
TOTAL SUPPLY	1,133	1,201	1,056	989	909	1,274
Oilseed Crushed	495	508	475	485	389	550
Planting Seed, Birdfood, Domestic Use	512	483	467	420	447	525
Exports	21	24	17	19	16	22
Disappearance	1,028	1,015	959	924	852	1,097
Ending Stocks	105	186	97	65	57	177
SUNFLOWER OIL						
Stocks, Oct. 1	21	34	41	33	19	22
Oil Imports	42	55	73	60	169	60
Oil Production	205	211	197	201	161	228
TOTAL SUPPLY	268	300	311	295	349	310
Domestic Oil Use	195	227	238	221	287	240
Oil Exports	39	32	40	55	40	40
Total Use	234	259	278	276	327	280
Ending Stocks	34	41	33	19	22	30
SUNFLOWER MEAL						
Stocks, Oct. 1	3	3	4	4	3	3
Production	252	259	242	247	198	281
TOTAL SUPPLY	255	262	246	251	202	283
Domestic Use	240	255	236	233	179	260
Exports	12	4	6	15	20	20
Total Use	252	259	242	248	199	280
Ending Stocks	3	3	4	3	3	3

2020 U.S. Sunflower Crop Quality Report

World Sunflower Supply & Disappearance

Sources:
Oil World & USDA

Item	2015/16	2016/17	2017/18	2018/19	2019/20 <i>Revised</i>	2020/21 <i>Forecast</i>
Area Harvested (1,000 HA)	25,242	26,964	26,885	27,185	27,440	28,226
Yield (MT/HA)	1.70	1.86	1.83	1.91	2.04	1.79
SUNFLOWER SEED —						
Production						
Argentina	2,830	3,300	3,400	3,530	3,150	2,830
European Union	7,769	8,641	10,058	9,482	9,485	8,696
China	2,698	2,750	2,580	2,550	2,680	2,730
Russia	9,700	11,600	11,000	12,756	15,379	13,200
Ukraine	12,100	15,100	13,400	15,250	16,500	14,300
United States	1,326	1,203	970	956	887	1,353
South Africa	755	874	862	678	786	780
Turkey	1,350	1,470	1,700	1,530	1,700	1,550
Other	4,386	5,130	5,086	5,292	5,346	5,020
TOTAL	42,914	50,068	49,056	52,024	55,913	50,459
Seed Import						
Turkey	436	611	721	1,051	1,058	950
European Union	577	632	520	550	1,036	880
Other	1,100	1,396	1,322	1,445	1,401	730
TOTAL	2,113	2,639	2,563	3,046	3,495	2,560
Seed Exports						
Argentina	302	74	58	149	214	170
United States	107	99	89	87	64	80
Russia	105	362	103	338	1,261	500
Ukraine	171	261	50	119	76	180
Other	1,467	1,804	2,234	2,392	1,911	1,617
TOTAL	2,152	2,600	2,534	3,085	3,526	2,547
Oilseed Crushed	38,177	44,845	44,663	47,231	50,474	45,499
SUNFLOWER OIL —						
Oil Opening Stocks	1,903	2,015	2,731	2,518	2,818	2,899
Oil Production	15,936	18,933	18,820	20,050	22,056	20,213
Oil Imports						
Iran	205	593	388	797	492	400
Turkey	766	801	517	529	772	850
Egypt	329	581	545	452	397	340
European Union	1,530	1,861	1,635	2,128	2,552	2,000
India	1,533	2,137	2,484	2,328	2,514	2,000
Others	3,989	4,494	4,613	5,171	6,511	5,647
TOTAL	8,352	10,467	10,182	11,405	13,238	11,237
Oil Exports						
Argentina	630	729	737	968	666	690
European Union	369	454	522	482	647	530
Russia	1,611	2,223	2,258	2,763	3,657	2,900
Ukraine	4,602	5,892	5,278	6,041	6,763	5,500
United States	39	32	40	55	40	40
Other	1,212	1,341	1,150	1,277	1,627	1,437
TOTAL	8,463	10,671	9,985	11,586	13,400	11,097
Disappearance	15,824	18,217	19,033	19,750	21,975	20,620
Ending Stocks	2,015	2,731	2,518	2,818	2,899	2,492
SUNFLOWER MEAL —						
Meal Production	17,082	19,917	20,046	20,900	22,056	20,213
Meal Imports	6,309	7,376	7,014	8,302	8,794	7,907
Meal Exports	6,339	7,504	6,944	8,221	8,849	7,860
Disappearance	17,076	19,696	20,088	20,861	21,910	20,453
Ending Stocks	227	321	348	538	630	437

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.

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