

~ 2022 ~

U.S. Sunflower Crop Quality Report



Regarding the 2022 Sunflower Crop Quality Report . . .

The 2022 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 2022 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).

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2022 U.S. Sunflower Acreage & Production

United States sunflower production in 2022 totaled 2.81 billion pounds, according to the USDA — an increase of 48% from the 1.9 billion pounds of 2021. At 2.57 billion pounds, production of oil-type sunflower was up 48% from the prior year's crop, while at 240.7 million pounds, the 2022 confection crop was 44% higher than 2021.

North Dakota regained its top spot among states in 2022, harvesting a total of 1.34 billion pounds of sunflower. That was 76% higher than in 2021. South Dakota, the 2021 leader, came in at 1.08 billion pounds, a 32% hike from the prior year. The biggest percentage increase occurred in Minnesota, where 2022 sunflower production totaled 174.7 million

pounds, 86% higher than that of 2021. The only surveyed states where 2022 production ranked lower than that of 2021 were California (39% less), Colorado (34% less) and Kansas (13% less). California's decline was mainly due to lower harvested acreage, while that of Colorado/Kansas was related to yield-lowering drought conditions.

Average yield among oil-type sunflower acres in 2022 was 1,739 pounds per acre — 214 pounds more than the 2021 average. Minnesota led at 2,370 pounds per acre, followed by North Dakota (1,900 pounds) and South Dakota (1,740 pounds).

On confection acreage, North Dakota averaged 2,170 pounds per acre, Texas 2,100 pounds and Minnesota 2,000 pounds.



U.S. Sunflower Production

(1,000s of Pounds)

	2019	2020	2021	2022
Oil	1,765,550	2,617,340	1,738,160	2,571,850
Nonoil	190,485	365,070	167,125	240,690
Total	1,956,035	2,982,410	1,905,285	2,812,540

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

(1,000s of Hectares)

State	2015	2016	2017	2018	2019	2020	2021	2022
Colorado	23.1	23.1	29.9	19.8	17.8	13.0	15.8	17.4
Kansas	21.4	17.0	20.2	16.6	14.2	21.0	9.7	11.3
Minnesota	30.4	25.9	13.4	17.8	20.6	27.1	21.4	27.1
Nebraska	10.9	11.3	11.5	9.7	10.5	15.8	13.4	18.6
North Dakota	244.8	246.9	155.4	153.8	178.1	255.0	182.1	261.0
South Dakota	230.7	200.3	210.4	196.3	186.2	226.6	188.2	234.7
Texas	35.2	11.3	12.1	7.7	10.5	12.1	13.4	15.8
Other	14.6	18.0	21.4	23.1	19.8	17.2	18.0	12.5
Total	611.1	553.8	474.3	444.8	457.7	587.8	462.0	598.4

2022 Seed Quality/Confection Kernel Specifications

Seed quality and kernel specifications of the 2022 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 44.3%, virtually identical to the 2021 average of 44.4%. Test weight averaged 30.4 pounds per bushel — 1.3 pounds lighter than the 2021 samples. Foreign material, at 4.6%, was slightly higher than the 2021 samples. At 8.6%, moisture was 0.2% below the average of the 2021 samples.

The percentage of con-

fection (nonoil) seeds over 20/64 in size averaged 82.6% among the 2022 crop year samples — 2.8% lower than the 2021 average of 85.4%.

Foreign material in the nonoils averaged 11.7% in 2022, 1.1% below the

2021 average. At 24.0 pounds per bushel, average 2022 nonoil test weight was 2.6 pounds higher than that of the 2021 samples. At 9.4%, nonoil average moisture was 0.4% above 2021's 9.0%.

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
<i>Quality and type of kernel is determined with the following factors to meet specific customer needs:</i>	
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.

Oil-Type Sunflower Seed Quality

Year	Test Weight (Lbs/Bu)	Moisture (%)	Foreign Material (%)	Oil (%)
2022	30.4	8.6	4.6	43.4
2021	31.7	8.8	4.4	44.4
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

Nonoil Sunflower Seed Quality

Year	Test Weight (Lbs/Bu)	Moisture (%)	Foreign Material (%)	Seeds Over 20/64 Size (%)
2022	24.0	9.4	11.7	82.6
2021	21.4	9.0	12.8	85.4
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

2022 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 2022 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 73.85% oleic average of 2022 NuSun® (mid-oleic) samples was well above 2021's mid-oleic average of 68.41%.

The 2022 high-oleic seed samples averaged an oleic acid content of 85.55%. That compares to

an 83.87% average of the 2021 high-oleic seed samples and an 84.26% average in 2020.

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
2022	3.34	3.24	85.55	5.74	0.16
2021	3.30	3.37	83.87	7.13	0.23
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

Sunflower Oil Quality / NuSun®

Percent

	Palmitic	Stearic	Oleic	Linoleic	Linolenic
Year	16:0	18:0	18:1	18:2	18:3
2022	3.81	3.31	73.85	16.96	0.28
2021	3.97	3.50	68.41	21.83	0.35
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

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)

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. Three types of sun meal, identified by their respective protein contents (28, 32 and 35%), are produced in the United States.

U.S. Sunflower Oil Exports

(October-September, in Metric Tons)

Country	2018/19	2019/20	2020/21	2021/22
Australia	1,511	646	392	382
Canada	20,402	23,716	26,370	40,498
Columbia	109	133	46	21
Germany	4,569	1	0	7
Japan	1,104	567	1,257	509
Malaysia	6,721	48	2,261	0
Mexico	17,015	9,686	10,300	7,268
Netherlands	35	166	228	594
Singapore	153	1	0	1
South Korea	157	2,261	1,692	3,828
Taiwan	616	501	540	815
Vietnam	1,415	63	15	26
Other	1,613	1,898	2,079	2,293
Total MT	55,420	39,687	45,180	56,242

U.S. Sunflower Meal Exports

(October-September, in Metric Tons)

Country	2018/19	2019/20	2020/21	2021/22
Canada	13,206	19,817	27,080	23,526
Indonesia	155	0	0	0
Mexico	0	0	663	0
Thailand	834	0	0	0
Vietnam	156	41	419	4,146
Other	0	103	0	64
Total MT	14,351	19,961	28,162	27,736



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

Item	2017/18	2018/19	2019/20	2020/21	2021/22 <i>Revised</i>	2022/23 <i>Forecast</i>
NONOIL SUNFLOWER						
Area Harvested (1,000 HA)	67	50	50	86	42	52
Area Harvested (1,000 AC)	166	123	123	214	104	128
Yield (MT/HA)	1.96	2.00	1.74	1.92	1.80	2.11
Yield (LB/AC)	1,750	1,781	1,555	1,711	1,602	1,880
Stocks, Oct. 1	39	49	32	25	43	33
Production	132	100	86	166	76	109
Seed Import	41	50	98	83	90	80
TOTAL SUPPLY	212	199	216	275	208	223
Disappearance	162	167	191	232	175	189
Ending Stocks	50	32	25	43	33	34
OIL SUNFLOWER						
Area Harvested (1,000 HA)	473	443	458	588	462	599
Area Harvested (1,000 AC)	1,168	1,094	1,131	1,452	1,142	1,479
Yield (MT/HA)	1.77	1.93	1.75	2.02	1.71	1.95
Yield (LB/AC)	1,582	1,725	1,561	1,802	1,523	1,739
Stocks, Oct. 1	187	97	66	58	104	67
Production	838	856	801	1,187	789	1,167
Seed Import	31	36	43	45	39	36
TOTAL SUPPLY	1,056	990	910	1,290	932	1,270
Oilseed Crushed	475	485	389	504	435	600
Planting Seed, Birdfood, Domestic Use	467	420	447	659	405	475
Exports	17	19	17	23	25	20
Disappearance	959	924	852	1,186	865	1,095
Ending Stocks	97	66	58	104	67	175
SUNFLOWER OIL						
Stocks, Oct. 1	41	33	18	22	26	29
Oil Imports	73	60	169	134	205	135
Oil Production	200	204	163	212	183	252
TOTAL SUPPLY	314	296	350	367	414	416
Domestic Oil Use	241	224	288	296	329	340
Oil Exports	40	55	40	45	56	50
Total Use	281	279	328	341	385	390
Ending Stocks	33	17	22	26	29	26
SUNFLOWER MEAL						
Stocks, Oct. 1	3	3	3	3	3	3
Production	242	247	198	257	222	306
TOTAL SUPPLY	245	251	201	260	225	309
Domestic Use	236	233	178	229	194	278
Exports	6	15	20	28	28	28
Total Use	242	248	198	257	222	306
Ending Stocks	3	3	3	3	3	3

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World Sunflower Supply & Disappearance

Sources:
Oil World & USDA

Item	2017/18	2018/19	2019/20	2020/21	2021/22 <i>Revised</i>	2022/23 <i>Forecast</i>
Area Harvested (1,000 HA)	26,885	27,185	27,413	28,045	30,152	28,714
Yield (MT/HA)	1.83	1.91	2.03	1.81	1.92	1.84
SUNFLOWER SEED —						
Production						
Argentina	3,400	3,530	3,020	3,200	3,400	3,700
European Union	10,058	9,482	9,469	8,969	10,467	9,529
China	2,580	2,550	2,680	2,750	2,880	2,900
Russia	11,000	12,756	15,379	13,420	15,400	16,000
Ukraine	13,400	15,250	16,500	13,900	16,800	10,600
United States	970	956	887	1,353	864	1,276
South Africa	862	678	810	678	846	800
Turkey	1,700	1,530	1,700	1,580	1,750	2,050
Other	5,086	5,292	5,202	4,995	5,532	6,003
TOTAL	49,056	52,024	55,647	50,845	57,939	52,858
Seed Import						
Turkey	721	1,051	1,058	844	673	570
European Union	520	550	1,057	817	1,805	1,936
Other	1,322	1,445	1,451	1,308	1,704	1,735
TOTAL	2,563	3,046	3,566	2,969	4,182	4,241
Seed Exports						
Argentina	58	149	214	178	158	155
United States	89	87	64	72	69	78
Russia	103	338	1,278	528	281	250
Ukraine	50	119	76	186	1,793	2,080
Other	2,234	2,392	1,980	1,907	1,895	1,762
TOTAL	2,534	3,085	3,612	2,871	4,196	4,325
Oilseed Crushed	44,663	47,231	50,300	45,568	48,526	49,346
SUNFLOWER OIL —						
Oil Opening Stocks	2,731	2,518	2,842	2,841	2,318	4,722
Oil Production	18,820	20,050	21,532	18,891	21,849	21,849
Oil Imports						
Iran	388	797	527	903	648	730
Turkey	517	529	772	719	1,065	1,100
Egypt	545	452	398	204	295	370
European Union	1,635	2,128	2,479	1,720	2,271	2,415
India	2,484	2,328	2,514	1,958	1,956	2,050
Others	4,613	5,171	6,881	5,872	5,008	5,860
TOTAL	10,182	11,405	13,571	11,376	11,243	12,525
Oil Exports						
Argentina	737	968	675	796	894	910
European Union	522	482	875	671	847	860
Russia	2,258	2,763	3,706	3,228	3,250	4,500
Ukraine	5,278	6,041	6,763	5,250	4,725	4,260
United States	40	55	40	45	56	50
Other	1,150	1,277	1,640	1,337	1,671	2,040
TOTAL	9,985	11,586	13,699	11,327	11,443	12,620
Disappearance	19,033	19,750	21,533	19,414	19,445	20,719
Ending Stocks	2,518	2,818	2,841	2,318	4,722	5,852
SUNFLOWER MEAL —						
Meal Production	20,046	20,900	21,972	20,285	21,556	21,907
Meal Imports	7,014	8,302	9,009	8,048	8,178	8,760
Meal Exports	6,944	8,221	8,991	8,092	8,436	8,617
Disappearance	20,088	20,861	21,967	20,278	20,922	22,062
Ending Stocks	348	538	272	308	685	672

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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