

BOARD OF TRADE OF THE CITY OF CHICAGO INC.

ANALYSIS OF DELIVERABLE SUPPLY

SOYBEAN OIL FUTURES

AUGUST 2018

In estimating deliverable supply for the Soybean Oil Futures, the Board of Trade of the City of Chicago Inc. ("CBOT" or "Exchange") relied on long-standing precedent, which provides that the key component in estimating deliverable supply is the portion of typical production and supply stocks that could reasonably be considered to be readily available for delivery. In its guidance on estimating deliverable supply, the Commodity Futures Trading Commission ("CFTC" or "Commission") states:

In general, the term "deliverable supply" means the quantity of the commodity meeting a derivative contract's delivery specifications that can reasonably be expected to be readily available to short traders and saleable by long traders at its market value in normal cash marketing channels at the derivative contract's delivery points during the specified delivery period, barring abnormal movement in interstate commerce. Typically, deliverable supply reflects the quantity of the commodity that potentially could be made available for sale on a spot basis at current prices at the contract's delivery points. For a non-financial physical-delivery commodity contract, this estimate might represent product which is in storage at the delivery point(s) specified in the futures contract or can be moved economically into or through such points consistent with the delivery procedures set forth in the contract and which is available for sale on a spot basis within the marketing channels that normally are tributary to the delivery point(s).¹

Background:

Soybean oil is a bi-product created from crushing soybeans and is a widely consumed vegetable oil and is also used extensively in the production of ink and paint. The USDA estimates 2017/18 soybean oil production at 10.657 million metric tons, a 6.2 percent increase from 2016/17.

Delivery Capacity:

The CBOT Soybean Oil futures contract calls for the delivery of 60,000 pounds of crude soybean oil. Most soybean oil produced in U.S. soybean processing facilities is eligible for delivery on CBOT Soybean Oil futures contracts. The Soybean Oil futures contract requires delivered crude soybean oil meet the following specifications:

- (a) It shall be one of the following types: Expeller pressed, expeller pressed degummed, solvent extracted, or solvent extracted degummed. Mixtures of one type with any other is not deliverable;
- (b) It shall contain no more than 0.3% moisture and volatile content;
- (c) It shall be lighter in green color than Standard "A" and when refined and bleached shall produce a refined and bleached oil of not deeper color than 3.5 red on the Lovibond scale;
- (d) It shall refine with a loss not exceeding 5% as determined by the "neutral oil" method;
- (e) It shall have a flash point not below 250 degrees Fahrenheit, closed cup method;
- (f) It shall contain no more than 1.5% unsaponifiable matter (exclusive of moisture and volatile matter).

No lower grades are deliverable. Higher grades may be delivered at contract price except when the refining loss is less than 5% as determined by the "neutral oil" method, a premium of one percent of the cash market price at the time of loading is paid for each one percent under the 5% loss (fractions figured throughout) with a maximum credit of 4½%.

When a bushel of soybeans weighing 60 pounds is crushed, the conventional result is 11 pounds of soybean oil, 44 pounds of soybean meal, 4 pounds of hulls, and 1 pound of waste.

¹ http://www.ecfr.gov/cgi-bin/text-idx?SID=74959c3dbae469e2efe0a42b45b8dfae&mc=true&node=ap17.1.38_11201.c&rgn=div9

The Soybean Oil futures contract has six delivery territories consisting of:

- (a) Illinois Territory (That portion of the state of Illinois north of latitude 38°00' N.)
- (b) Eastern Territory (Those portions of the states of Indiana and Kentucky west of the Ohio-Indiana border and its extension and north of latitude 38°00'N.)
- (c) Eastern Iowa Territory (That portion of the state of Iowa east of longitude 93°50'W.)
- (d) Southwest Territory (Those portions of the states of Missouri and Kansas north of latitude 38°00'N. and east of longitude 97°00'W.)
- (e) Western Territory (Those portions of the states of Iowa west of longitude 93°50'W., and Nebraska east of longitude 97°00'W.)
- (f) Northern Territory (Those portions of the states of Minnesota south of latitude 45°10'N., and South Dakota south of latitude 45°10'N., and east of 97°00'W.)

Soybean oil is a very storable commodity, and the amount of soybean oil the Exchange allows registered delivery facilities to deliver (regular capacity) is based on the lesser of each facility's approved storage space or 20 times their registered daily rate for loading jumbo tank cars. Below are the facilities regular for delivery on CBOT Soybean Oil futures and the maximum number of warehouse receipts each facility may deliver:

FIRM/FACILITIES	REGULAR SPACE (POUNDS)	MAXIMUM WAREHOUSE RECEIPTS ALLOWED TO ISSUE
AG PROCESSING, INCORPORATED		
Dawson, MN	24,000,000	334
Eagle Grove, IA	20,000,000	333
Emmetsburg, IA	88,000,000	1,466
Manning, IA	9,000,000	150
Mason City, IA	36,000,000	600
Omaha, NE	40,000,000	666
Sergeant Bluff, IA	21,000,000	350
Sheldon, IA	19,200,000	320
St. Joseph, MO	24,000,000	400
ARCHER DANIELS MIDLAND CO		
Decatur, IL	118,400,000	1,973
Des Moines, IA	44,421,696	740
Frankfurt, IN	25,900,000	431
Lincoln, NE	63,600,000	1,060
Mexico, MO	29,600,000	493
Quincy, IL	48,400,000	816
Mankato, MN	37,020,000	616
BUNGE NORTH AMERICA (EAST), LLC		
Decatur, IN	118,950,000	1,333
BUNGE NORTH AMERICA (ODP WEST), INC		
Emporia, KS	36,600,000	416
CARGILL, INC.		
Ackley, IA	190,000,000	3,166
Bloomington, IL	3,900,000	65
Cedar Rapids, IA	1,920,000	32
Cedar Rapids, (E), IA	9,300,000	155
Iowa Falls, IA	20,000,000	233
Kansas City, MO	10,364,000	172
Lafayette, IN	9,000,000	150

FIRM/FACILITIES	REGULAR SPACE (POUNDS)	MAXIMUM WAREHOUSE RECEIPTS ALLOWED TO ISSUE
Creve Coeur, IL	50,000,000	833
Camanche, IA	44,500,000	498
CHS Inc.		
Mankato, MN	14,600,000	243
INCOBRASA INDUSTRIES, LLC		
Gilman, IL	23,000,000	383
LOUIS DREYFUS CLAYPOOL HOLDINGS, LLC		
Claypool, IN	30,000,000	370
MINNESOTA SOYBEAN PROCESSORS		
Brewster, MN	88,800,000	1,480
SOLAE LLC		
Gibson City, IL	45,600,000	760
SOUTH DAKOTA SOYBEAN PROCESSORS, LLC		
Volga, SD	200,700,000	3,316
ZEELAND FARM SERVICES, INC		
Portage, IN	21,000,000	350
TOTALS	1,566,775,696	24,703

As of August 2018, the CBOT Soybean Oil futures contract has over 1.566 billion pounds of approved regular storage capacity and firms may deliver up to 24,703 warehouse receipts.

Deliverable Supply:

The U.S. Census Bureau collected, and the USDA published monthly soybean oil production estimates for the U.S. until September 2011 when the *Oilseed Crushings* report was discontinued. The National Oilseed Processors Association (NOPA) continues to publish monthly soybean oil production and storage for its member firms. A list of processing plants included in the NOPA Statistical crush report is available here:

<http://www.nopa.org/oilseed-processing/nopa-plant-locations/>

Also, here is the link for information about the NOPA monthly statistical crush report on Thomson Reuters:

<http://commoditiesupdates.thomsonreuters.com/nopa/>

NOPA reports soybean oil production and stocks for 58 processing plants. Of these 58 plants, 26 of them are regular for delivering on Soybean Oil futures. Additionally, there are 8 plants that are regular for futures delivery but not part of the NOPA Statistical crush report.

NOPA production and stocks reports are broken down into the following six regions:

- Illinois
- Pennsylvania, Indiana, Kentucky, Ohio, Michigan
- Southeast
- Southwest
- Iowa
- Minnesota, North Dakota, South Dakota, Montana

NOPA Territory	Number of NOPA Reporting Plants	Number of NOPA Plants that are Regular for Delivery	Percentage of NOPA Plants that are Regular for Delivery
Illinois	7	4	57%
Pennsylvania, Indiana, Kentucky, Ohio, Michigan	13	4	31%
Southeast	10	0	0%
Southwest	12	5	42%
Iowa	12	10	83%
Minnesota, North Dakota, South Dakota, Montana	4	3	75%
TOTAL	58	26	45%

Deliverable supply is estimated based on NOPA reported soybean oil stocks in each of their territories during the month prior to each futures contract delivery. These values are then weighted by the percentage of NOPA member processing plants that are also regular for delivery on CBOT Soybean Oil futures to estimate futures deliverable supplyⁱ.

December 2015-2017 (November 2015-2017 Stocks)

NOPA Territory	NOPA Stocks (1,000 lbs)	Weighting	Estimated Deliverable Supply (1,000 lbs)
Nov-15			
Illinois	246,028	57%	140,236
PA, IN, KY, OH, MI	298,660	31%	92,585
Southeast	123,909	0%	0
Southwest	412,847	42%	173,396
Iowa	306,442	83%	254,347
MN, ND, SD, MT	83,103	75%	62,327
ESTIMATED DELIVERABLE SUPPLY 2015			722,890
		Contracts	12,048
Nov-16			
Illinois	249,760	57%	142,363
PA, IN, KY, OH, MI	307,734	31%	95,398
Southeast	114,594	0%	0
Southwest	289,626	42%	121,643
Iowa	335,697	83%	278,629
MN, ND, SD, MT	41,230	75%	30,923
ESTIMATED			668,955

DELIVERABLE SUPPLY 2016			
		Contracts	11,149
Nov-17			
Illinois	246,635	57%	140,582
PA, IN, KY, OH, MI	316,167	31%	98,012
Southeast	148,169	0%	0
Southwest	213,698	42%	89,753
Iowa	321,932	83%	267,204
MN, ND, SD, MT	79,702	75%	59,777
ESTIMATED DELIVERABLE SUPPLY 2017			655,327
		Contracts	10,922
ESTIMATED DELIVERABLE SUPPLY 2015-2017			682,391
		Contracts	11,373

January 2016-2018 (December 2015-2017 Stocks)

NOPA Territory	NOPA Stocks (1,000 lbs)	Weighting	Estimated Deliverable Supply (1,000 lbs)
Dec-15			
Illinois	258,636	57%	147,423
PA, IN, KY, OH, MI	310,119	31%	96,137
Southeast	124,364	0%	0
Southwest	378,669	42%	159,041
Iowa	299,626	83%	248,690
MN, ND, SD, MT	109,671	75%	82,253
ESTIMATED DELIVERABLE SUPPLY 2015			733,543
		Contracts	12,226
Dec-16			
Illinois	265,532	57%	151,353

PA, IN, KY, OH, MI	295,152	31%	91,497
Southeast	139,015	0%	0
Southwest	367,635	42%	154,407
Iowa	321,563	83%	266,897
MN, ND, SD, MT	45,049	75%	33,787
ESTIMATED DELIVERABLE SUPPLY 2016			697,941
		Contracts	11,632
Dec-17			
Illinois	266,659	57%	151,996
PA, IN, KY, OH, MI	344,890	31%	106,916
Southeast	157,929	0%	0
Southwest	271,596	42%	114,070
Iowa	379,567	83%	315,041
MN, ND, SD, MT	97,531	75%	73,148
ESTIMATED DELIVERABLE SUPPLY 2017			761,171
		Contracts	12,686
ESTIMATED DELIVERABLE SUPPLY 2015-2017			730,885
		Contracts	12,181

March 2015-2017 (February 2015-2017 Stocks)

NOPA Territory	NOPA Stocks (1,000 lbs)	Weighting	Estimated Deliverable Supply (1,000 lbs)
Feb-15			
Illinois	332,873	57%	189,738
PA, IN, KY, OH, MI	234,921	31%	72,826
Southeast	115,391	0%	0
Southwest	248,270	42%	104,273
Iowa	302,706	83%	251,246
MN, ND, SD, MT	87,894	75%	65,921

ESTIMATED DELIVERABLE SUPPLY 2015			684,003
		Contracts	11,400
Feb-16			
Illinois	343,309	57%	195,686
PA, IN, KY, OH, MI	424,613	31%	131,630
Southeast	142,667	0%	0
Southwest	347,159	42%	145,807
Iowa	396,139	83%	328,795
MN, ND, SD, MT	138,165	75%	103,624
ESTIMATED DELIVERABLE SUPPLY 2016			905,542
		Contracts	15,092
Feb-17			
Illinois	303,279	57%	172,869
PA, IN, KY, OH, MI	326,366	31%	101,173
Southeast	185,524	0%	0
Southwest	396,799	42%	166,656
Iowa	463,267	83%	384,512
MN, ND, SD, MT	94,824	75%	71,118
ESTIMATED DELIVERABLE SUPPLY 2017			896,328
		Contracts	14,939
ESTIMATED DELIVERABLE SUPPLY 2015-2017			828,624
		Contracts	13,810

May 2015-2017(April 2015-2017 Stocks)

NOPA Territory	NOPA Stocks (1,000 lbs)	Weighting	Estimated Deliverable Supply (1,000 lbs)
Apr-15			
Illinois	345,591	57%	196,987

PA, IN, KY, OH, MI	306,637	31%	95,057
Southeast	96,919	0%	0
Southwest	277,478	42%	116,541
Iowa	331,383	83%	275,048
MN, ND, SD, MT	82,977	75%	62,233
ESTIMATED DELIVERABLE SUPPLY 2015			745,866
		Contracts	12,431
Apr-16			
Illinois	386,801	57%	220,477
PA, IN, KY, OH, MI	505,215	31%	156,617
Southeast	116,604	0%	0
Southwest	395,992	42%	166,317
Iowa	424,880	83%	352,650
MN, ND, SD, MT	113,237	75%	84,928
ESTIMATED DELIVERABLE SUPPLY 2016			980,988
		Contracts	16,350
Apr-17			
Illinois	378,119	57%	215,528
PA, IN, KY, OH, MI	367,787	31%	114,014
Southeast	130,366	0%	0
Southwest	262,579	42%	110,283
Iowa	496,942	83%	412,462
MN, ND, SD, MT	89,610	75%	67,208
ESTIMATED DELIVERABLE SUPPLY 2017			919,494
		Contracts	15,325
ESTIMATED DELIVERABLE SUPPLY 2015-2017			882,116
		Contracts	14,702

July 2015-2017 (June 2015-2017 Stocks)

NOPA Territory	NOPA Stocks (1,000 lbs)	Weighting	Estimated Deliverable Supply (1,000 lbs)
Jun-15			
Illinois	364,650	57%	207,851
PA, IN, KY, OH, MI	319,505	31%	99,047
Southeast	115,853	0%	0
Southwest	309,739	42%	130,090
Iowa	391,795	83%	325,190
MN, ND, SD, MT	72,384	75%	54,288
ESTIMATED DELIVERABLE SUPPLY 2015			816,465
			Contracts 13,608
Jun-16			
Illinois	325,336	57%	185,442
PA, IN, KY, OH, MI	500,865	31%	155,268
Southeast	161,220	0%	0
Southwest	442,667	42%	185,920
Iowa	476,338	83%	395,361
MN, ND, SD, MT	78,549	75%	58,912
ESTIMATED DELIVERABLE SUPPLY 2016			980,902
			Contracts 16,348
Jun-17			
Illinois	362,630	57%	206,699
PA, IN, KY, OH, MI	369,692	31%	114,605
Southeast	98,315	0%	0
Southwest	304,772	42%	128,004
Iowa	477,519	83%	396,341
MN, ND, SD, MT	90,478	75%	67,859
ESTIMATED			913,507

DELIVERABLE SUPPLY 2017		Contracts	15,225
ESTIMATED DELIVERABLE SUPPLY 2015-2017			903,625
		Contracts	15,060

August 2015-2017 (July 2015-2017 Stocks)

NOPA Territory	NOPA Stocks (1,000 lbs)	Weighting	Estimated Deliverable Supply (1,000 lbs)
Jul-15			
Illinois	338,228	57%	192,790
PA, IN, KY, OH, MI	307,799	31%	95,418
Southeast	135,681	0%	0
Southwest	351,186	42%	147,498
Iowa	408,112	83%	338,733
MN, ND, SD, MT	83,306	75%	62,480
ESTIMATED DELIVERABLE SUPPLY 2015			836,918
		Contracts	13,949
Jul-16			
Illinois	278,806	57%	158,919
PA, IN, KY, OH, MI	489,166	31%	151,641
Southeast	56,351	0%	0
Southwest	401,393	42%	168,585
Iowa	459,001	83%	380,971
MN, ND, SD, MT	58,467	75%	43,850
ESTIMATED DELIVERABLE SUPPLY 2016			903,967
		Contracts	15,066
Jul-17			
Illinois	362,620	57%	206,693

PA, IN, KY, OH, MI	325,958	31%	101,047
Southeast	104,301	0%	0
Southwest	232,830	42%	97,789
Iowa	435,395	83%	361,378
MN, ND, SD, MT	96,748	75%	72,561
ESTIMATED DELIVERABLE SUPPLY 2017			839,468
		Contracts	13,991
ESTIMATED DELIVERABLE SUPPLY 2015-2017			860,118
		Contracts	14,335

September 2015-2017 (August 2015-2017 Stocks)

NOPA Territory	NOPA Stocks (1,000 lbs)	Weighting	Estimated Deliverable Supply (1,000 lbs)
Aug-15			
Illinois	332,055	57%	189,271
PA, IN, KY, OH, MI	285,955	31%	88,646
Southeast	111,026	0%	0
Southwest	282,965	42%	118,845
Iowa	375,674	83%	311,809
MN, ND, SD, MT	92,495	75%	69,371
ESTIMATED DELIVERABLE SUPPLY 2015			777,943
		Contracts	12,966
Aug-16			
Illinois	251,513	57%	143,362
PA, IN, KY, OH, MI	411,384	31%	127,529
Southeast	74,285	0%	0
Southwest	400,803	42%	168,337
Iowa	436,294	83%	362,124
MN, ND, SD, MT	46,000	75%	34,500

ESTIMATED DELIVERABLE SUPPLY 2016			835,853
		Contracts	13,931
Aug-17			
Illinois	297,384	57%	169,509
PA, IN, KY, OH, MI	299,709	31%	92,910
Southeast	102,061	0%	0
Southwest	279,833	42%	117,530
Iowa	366,922	83%	304,545
MN, ND, SD, MT	71,106	75%	53,330
ESTIMATED DELIVERABLE SUPPLY 2017			737,823
		Contracts	12,297
ESTIMATED DELIVERABLE SUPPLY 2015-2017			783,873
		Contracts	13,065

October 2015-2017 (September 2015-2017 Stocks)

NOPA Territory	NOPA Stocks (1,000 lbs)	Weighting	Estimated Deliverable Supply (1,000 lbs)
Sep-15			
Illinois	290,260	57%	165,448
PA, IN, KY, OH, MI	277,906	31%	86,151
Southeast	101,409	0%	0
Southwest	304,430	42%	127,861
Iowa	304,767	83%	252,957
MN, ND, SD, MT	75,931	75%	56,948
ESTIMATED DELIVERABLE SUPPLY 2015			689,365
		Contracts	11,489
Sep-16			
Illinois	185,512	57%	105,742

PA, IN, KY, OH, MI	354,697	31%	109,956
Southeast	111,792	0%	0
Southwest	290,115	42%	121,848
Iowa	381,959	83%	317,026
MN, ND, SD, MT	51,878	75%	38,909
ESTIMATED DELIVERABLE SUPPLY 2016			693,481
		Contracts	11,558
Sep-17			
Illinois	261,029	57%	148,787
PA, IN, KY, OH, MI	322,552	31%	99,991
Southeast	103,052	0%	0
Southwest	227,634	42%	95,606
Iowa	311,397	83%	258,460
MN, ND, SD, MT	76,248	75%	57,186
ESTIMATED DELIVERABLE SUPPLY 2017			660,029
		Contracts	11,000
ESTIMATED DELIVERABLE SUPPLY 2015-2017			680,958
		Contracts	11,349

Seasonality:

The Exchange continuously monitors the deliverable supply and the delivery requirements on the Contract. Further, the Exchange closely monitors seasonality and to the extent that the Exchange anticipates that 25 percent of any contract month's deliverable supply would fall below the current spot month limit, the Exchange would make a good faith effort to resolve conditions potentially limiting the adequacy of the deliverable supply or evaluate whether there is a need to adjust the spot-month position limit for that corresponding contract month.

Long Term Contracts:

There is no readily available data on soybean oil under long-term contracts or agreements that could not be delivered on futures and should not be counted in deliverable supply estimates. To gauge the potential impact of long-term contracts, the Exchange conducted outreach to three regular warehousemen. Feedback from these three warehousemen suggests long-term agreements should not affect deliverable soybean oil stocks should it become economical to deliver against futures. The organization of the soybean crush market makes it unlikely much if any oil would ever be contracted under long-term agreements.

Soybeans are typically crushed for meal rather than oil, and the U.S. historically carries significant quantities of oil in store. Buyers typically enter long-term agreements when they have concerns about meeting their use needs, which rarely if ever happens with soybean oil.

ANALYSIS OF DELIVERABLE SUPPLY

Most although not all NOPA member soybean oil stocks data would meet CBOT Soybean Oil futures specifications. Unfortunately, NOPA does not distinguish among quality attributes in its monthly statistics. Thus, the Exchange does not try to account for stocks that may not meet Exchange quality specifications. However, this is likely a very conservative estimate because, although stocks not meeting specifications are not subtracted, none of the significant stocks produced and/or stored at plants and storage facilities regular for delivery on Soybean Oil futures that are not NOPA member processing plants are counted.

Based on the above analysis, the Exchange estimates the monthly deliverable supply over the past three years to be approximately 794 million pounds or **13,235** contract equivalents (contract size: 60,000 pounds). The current spot month limit of 540 represents **4.1%** of this estimated monthly deliverable supply.

¹ The crushing capacity of plants is proprietary data. In aggregate, however, on 1 January 2018, regular firms had a 30-day crushing capacity of 92,145,000 bushels of soybeans. Without knowing the crushing capacity of NOPA members that are not also regular for delivery on Soybean Oil futures, total NOPA crush capacity has to be estimated. From December 2015 to current, the maximum NOPA crush was during March 2018 when NOPA member firms crushed 171,858,000 bushels of soybeans. Assuming this maximum NOPA crush is near 100 percent of NOPA capacity, Soybean Oil regular firms have crushing capacity that is 57 percent of NOPA capacity despite being only $26/58 = 45$ percent of NOPA member firms, which suggests plants regular for delivery on Soybean Oil futures are, on average, larger than the average NOPA reporting plant. The current Deliverable Supply estimate based on regular firms that are also NOPA members uses 45 percent of NOPA reported stocks (i.e., the estimate DOES NOT count the eight regular firms that are not NOPA members). Thus, the Deliverable Supply estimate is likely a very conservative estimate.