Sunflower Marketing in the High Plains

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Kansas State University Agricultural Experiment Station
and Cooperative Extension Service

Sunflower is an economically viable crop alternative for growers in the High Plains, including Kansas, Colorado, and Nebraska. It is well adapted agronomically to both irrigated production and dryland cropping systems in the region, and is a potential "double crop" option where growing season length permits. The profitability of dryland sunflower production has been comparable to other summer crops in High Plains cropping systems. Irrigated sunflowers also have a competitive economic niche in parts of the High Plains such as western Kansas where groundwater supplies are sometimes too limited to support fully irrigated corn production. The existence of a number of major sunflower processing plants in the High Plains provides area sunflower producers with local market outlets for the crop, and helps ensure the long-run viability of the sunflower enterprise in the region.

Markets exist in the High Plains for three differentiated sunflower products — oil, confection, and birdseed sunflowers. Contracting of confection sunflower production between producers and processors is prevalent, which points to the need for an understanding of sunflower contract grade and quality specifications on the part of area sunflower producers.

Since the late 1990s, the U.S. oil sunflower industry has been in a process of transition toward the use of mid-oleic varieties. The sunflower oil produced by these mid-oleic sunflower varieties is commonly referred to as NU-SUN, a title originating with the National Sunflower Association. The oleic oil content of these mid-oleic sunflower varieties must test between 55 percent and 75 percent. The oil produced from mid-oleic sunflower has a number of physical characteristics that makes it attractive to health conscious consumers and consequently the U.S. food processing industry. If mid-oleic sunflower production becomes well established, it holds the potential to shift the focus of demand for U.S. sunflower oil away from volatile world export markets toward what is hoped to be a more stable U.S. domestic food processing industry. More information on mid-oleic sunflower varieties will be presented in following sections.

This publication addresses basic issues related to sunflower marketing in the High Plains, including Kansas, Colorado, and Nebraska. Following a description of sunflower markets and historic price patterns, information is presented about deliverable sunflower grade and quality specifications and the types of sunflower marketing alternatives available to central Great Plains producers. The publication concludes by discussing sunflower market information sources and the development of sunflower marketing plans.

Sunflower Market Supply, Demand, and Prices

Sunflower acreage. Sunflower acreage in the United States and in the High Plains states is relatively small in comparison to other major crops (Table 1). Sunflower is, and has been, primarily grown in the states of North Dakota, South Dakota, Minnesota, Kansas, Colorado, Nebraska, and Texas. In 2001, the Northern plains had the largest sunflower acreage in the United States, with North Dakota being the regional and national leader for both oil and confection types. Kansas is the third largest state in terms of oil sunflower acreage, followed by Colorado and Nebraska. Colorado had the largest confection sunflower acreage among the High Plains states in 2001, followed in order by Texas, Nebraska, and Kansas. Most of the sunflower production in the High Plains is located in sections of the three state region of northwestern and west central Kansas, east central and northeast Colorado, and southwest and the panhandle sections of Nebraska.

Sunflower seed supply, disappearance, and prices. Since the early 1980s, U.S. sunflower seed, sunflower oil, and sunflower meal markets have exhibited large year-to-year supply-demand and price variability. The sunflower seed market has been characterized by periods of first declining and then increasing supplies since the early 1980s (Appendix A, Table A). Sunflower seed disappearance has been affected by increasing Non Oil + Seed Use and year-to -year variation in sunflower seed exports. Sunflower seed ending

Table 1. *Planted crop acreage in selected states in year 2001 (in thousands)* [a]

	Kansas	Colorado	Nebraska	Texas	North Dakota	South Dakota	Minnesota	United States
Corn	3,400	1,130	8,300	1,900	950	270	6,800	76,693
Soybeans	3,000	0	4,850	1,050	2,400	4,700	7,600	76,687
All Wheat	9,900	2,452	1,800	5,700	10,060	2,875	2,072	60,299
Grain Sorghum	3,600	300	650	2,900	0	190	0	9,368
Dry Beans	15	90	140	18	500	11	120	1,452
Oil Type Sunflower	290	120	65	30	900	600	50	2,109
Confection Sunflower	30	85	40	55	300	50	50	623

a. Source: March 2001 Planting Intentions Report from USDA Agricultural Statistics Board

stocks have varied inversely with changes in prices 62 percent of the time during this period. Supply and demand conditions in the United States and world vegetable oil market have been, and will likely continue to be, dominant factors in the determination of U.S. sunflower seed prices. However, the introduction of mid-oleic or NU-SUN varieties and the anticipated shifting of focus from export to U.S. domestic uses may insulate U.S. sunflower seed prices from world oil-seed oil market supply-demand fluctuations. Government commodity loan price coverage has been available for U.S. sunflower since 1991. National average cash sunflower prices have been below national average loan rates in 3 of the last 10 marketing years (i.e., in 1991/92, 1999/00, and 2000/01) and are anticipated to be below loan rate again in the 2001/02 marketing year. Since 1998/99 sunflower prices have been low enough, relative to commodity loan rates, to generate sizable loan deficiency payments for sunflower producers. Variability in annual prices for U.S. sunflower and the relative level of oil-sunflower loan rates are shown in Figure 1.

Sunflower oil and meal supply, disappearance, and prices. Supplies of sunflower oil and meal closely follow the availability of sunflower seed supplies. While domestic use of sunflower oil has been relatively stable, exports and prices vary considerably from year to year (Appendix A, Table B). Since the early 1980s, average sunflower oil prices have fallen to lows of $16.01, $16.50, and $15.75 per hundred weight during the 1986/87, 1999/00, and 2000/01 marketing years, respectively. High prices of $33.60, $30.00, and $31.00 per hundred weight occurred during the 1983/84, 1984/85, and 1993/94 marketing years. Sunflower meal prices have also been variable over time, but have had several 2-to 4-year periods of relative price stability (Appendix A, Table C). The annual average price for sunflower meal reported by the USDA is for meal with 28 percent protein. However, most U.S. sunflower meal is now sold on a 30 percent protein basis.

Sunflower seasonal price patterns. Definite seasonal patterns exist in U.S. monthly average cash prices for sunflower seed (Figure 2). Since the 1985/86 marketing year, sunflower seed prices have tended to be lowest during September through January, with prices ranging from 94 percent to 98 percent of the marketing year average. Sunflower prices have then typically risen slightly above (101 to 102 percent) the seasonal average price during February through April. The highest sunflower prices for the marketing year have usually occurred during May through August (i.e., 104 to 105 percent of the season average price). Variability in the season average price pattern is indicated by the upper and lower bounds of the 67 percent price interval. Price variability tends to be less during midwinter and early spring (January through April). The widest variability around this seasonal price pattern has typically occurred during June through September (i.e., the U.S. growing season for sunflowers and other major oilseed crops).

Figure 1. *U.S. sunflower marketing year average prices and oil-sunflower commodity loan rate (Source: USDA)*

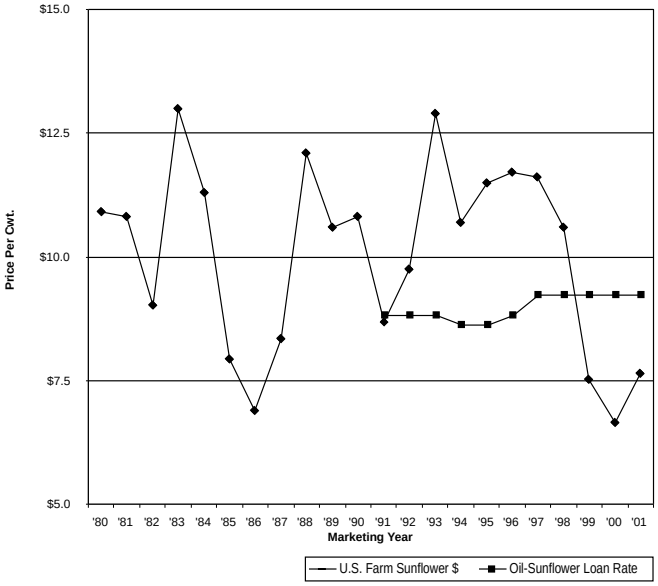
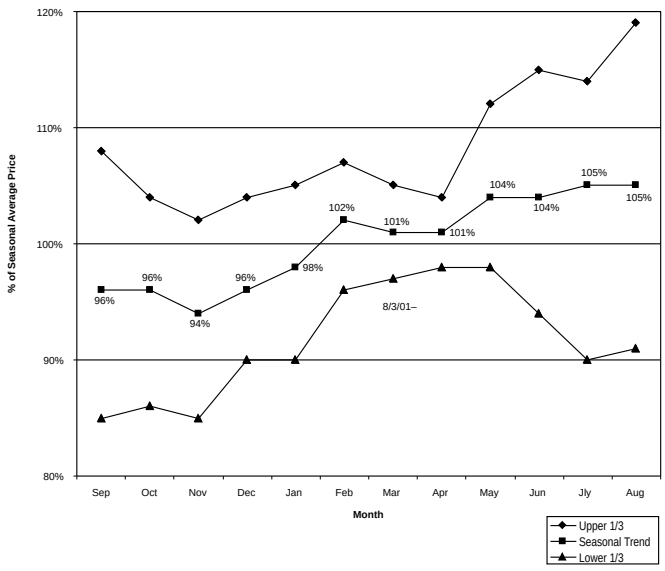


Figure 2. *Seasonal average U.S. cash sunflower seed price patterns, 1985/86-1999/00 marketing years (Sources: USDA Economic Research Service, KSU Ag Economics)*



Markets for Sunflower

Two primary kinds of sunflower are grown in the High Plains – oil type and confections (non-oil or edible). Oil sunflower is more commonly grown in the High Plains, representing 90 percent of Kansas acreage in 2001, 59 percent of sunflower acres in Colorado, 62 percent in Nebraska, but only 35 percent of 2001 sunflower acres in Texas. Oil sunflower varieties have a shiny black coat and are crushed to produce a high-quality vegetable oil used in cooking. Sunflower meal is also a product of the crushing process for oil sunflowers, and is used as high-protein livestock feed. Discarded sunflower parts from the crush process also are used in livestock feed, together with sunflower meal. Confection sunflowers have larger seeds, that are black and white striped. Confections are grown to produce food products for baking or direct nut consumption. Sunflower also is produced in the High Plains for birdseed consumption. Birdseed sunflower sales represent a small, but fast growing, portion of the state's sunflower production, with some sunflower varieties grown specifically to meet birdseed contract specifications. Some small sunflower nut meats from hulled sunflowers also go into the birdseed sunflower market. Confection sunflowers that are too small to meet market specifications for human consumption are often sold as birdseed by processors.

The oil sunflower market. The demand for oil sunflower is derived largely from the market demand for sunflower oil and meal, the by-products of the sunflower crush process. Sunflower seed oil is one of many vegetable oil products that make up the "oilseed complex." Other oilseed crops include soybeans, cottonseed, canola, industrial rapeseed, safflower, crambe, sesame seed, coconut, and palm oil. These alternative oilseed product sources are competitive, although not perfect, substitutes. Therefore, changes in supply-demand conditions and prices for any one of these oilseeds will tend to have crossover effects upon other oilseed product prices and the overall oilseed oil market. Soybean oil production and consumption dominates the oilseeds complex, as shown by its 74.5 percent market share average of U.S. oilseed oil consumption during the 1999/00 through 2000/01 marketing year.

Cash and futures prices for soybean oil act as benchmarks for the entire U.S. vegetable oil complex. Sunflower oil is preferred over other vegetable oil sources for cooking because of its relatively low levels of both saturated fat and linolenic acid.[1] As a result, sunflower seed oil typically commands a price premium over soybean oil. To illustrate, from the 1991/92 through the 1999/00 marketing years, annual U.S. sunflower oil prices averaged $24.22 per hundred weight, which was 7 percent or $1.61 per hundred weight greater than for U.S. soybean oil at $22.61 per hundred weight. (Source: USDA Oil Crops Outlook, May 2001). Sunflower oil exports have averaged 77 percent of total sunflower oil use during the 1991/92 through 1997/98 marketing years with the remainder being used domestically. The percentage of U.S. sunflower oil exported during the 1998/99 through 2000/01 marketing years declined to 64 percent.

High-oleic sunflowers are special oil hybrids that have an oleic acid content of 80 percent or greater. Oleic acid is a fatty acid that contains the highest level of monounsaturates among commercially available alternatives. Market niches have developed for high-oleic sunflower oil within the food industry and in other industrial applications. As a result, production from high-oleic sunflower hybrids commands a price premium over regular oil sunflower. Industry sources indicate that most of the acreage of high-oleic sunflowers in the United States is in North and South Dakota, and that high-oleic acreage in Kansas is very small. Significant acreage of high-oleic sunflowers exist in Europe, Argentina, and Australia.

In contrast to the high-oleics, mid-oleic sunflower varieties have oleic acid contents of 55 to 75 percent, a linoleic acid level of 30 percent, and a saturated-fatty acid content of eight percent or less. Mid-oleic sunflower oil has performed as well as cotton oil (i.e., the industry standard) in consumer frying tests, with the added benefit of having low saturated fat levels. There is optimism in the sunflower industry that mid-oleic sunflower oil can fulfill U.S. consumer demand for a nonhydrogenated and reasonably priced frying oil in coming years, both in the U.S. snack food and the fast food industries. If accepted by consumers, the transition to mid-oleic sunflower oil production would coincide with a shift in U.S. sunflower demand for stable and potentially lucrative domestic markets. Since the large-scale introduction of mid-oleic sunflower varieties in the late 1990s, the premium paid to sunflower producers for mid-oleic sunflower seed over regular sunflower seed has been approximately $0.40 to $0.50 per hundred weight.

Sunflower seed meal is the second product resulting from sunflower seed crush. It is used in livestock feed rations as a protein supplement. During the 1991/92 through 2000/01 marketing years an average of 93 percent of U.S. sunflower meal was used domestically,

[1] Saturated fat is associated with high serum cholesterol levels and heart disease in some people. Oils with linolenic acid levels above 2 percent (sunflower is 0 percent) tend to develop off flavors because the linolenic acid oxidizes quickly and must be hydrogenated to enhance shelf life.

with exports making up the other 7 percent (Appendix A, Table C). Sunflower seed meal can be sold at protein contents ranging from 28 to 38 percent, depending on the amount of hulling done prior to crushing. The sunflower crush plant near Goodland, Kansas, currently produces 30 percent protein meal. Compared to soybean meal, sunflower seed meal has lower protein (28 to 38 percent vs. 44 percent), a higher fiber content (13 to 21 percent vs. 7 percent), and a limited level of lysine (an important nutritional component in swine and poultry diets). Sunflower meal is usually priced at a sizable discount to soybean meal. During the 1991/92 through 1999/00 marketing years, high protein soybean meal at Decatur, Illinois, sold for an average price of $191.96 per short ton, compared to sunflower meal at Minneapolis, Minnesota, which sold for $86.81 per short ton.

The confection sunflower market. Confection sunflower is primarily a specialty food product. The public perceives sunflower seed as a healthy snack, differentiating it from other snack food substitutes such as peanuts, almonds, walnuts, potato chips, and dried fruit. It can be sold either in-shell as a snack food or hulled (without outer shell) for use in baking. The largest seeds are sold in-shell, and the smallest are sold on the birdseed market. In-between-sized seed are usually hulled and sold as nut meats. Processors generally purchase seed from producers, which they clean, size, and dehull. The processed seed and seed product are then sold to various distributors (either wholesalers, retailers, or sellers into export markets) in accordance with each of their product specifications.

Confection and birdseed sunflower made up approximately 17 percent of the overall U.S. sunflower production and disappearance in the 2000/01 marketing year. While data pertaining to confection sunflower disappearance is limited, generally 50 percent of U.S. confection sunflower production is exported (Source: National Sunflower Association, 2001). Historically, confection sunflower seed has commanded a price premium over oil-type sunflower seed. However, if confection sunflower is crushed, it is typically sold at a 20 to 30 percent discount to oil sunflower due to its lower oil content.

The birdseed market. Information regarding sunflower seed use as birdseed is limited. A 1985 survey by the U.S. Fish and Wildlife Service found that 82 million Americans feed wild birds – a 32 percent increase from 1982. Results from that same survey indicated that total birdseed expenditures at just over $1 billion in 1985, a 116 percent increase over 1982. Today, some birdseed sunflower industry sources estimate the birdseed market sales to be at least $10 billion annually, including sales of millet and other small grains. While the quantity of sunflower sales as birdseed is difficult to document, industry sources indicate that approximately 450,000 metric tons of sunflower were used as birdseed in the 2000-01 marketing year (Source: National Sunflower Association, 2001). Some of both oil and confection sunflower seed production finds its way into the birdseed market. However, oil sunflower seed is preferred because of its higher oil content (a better energy source for wildlife) and thinner hulls (easier for wildlife to crack open).

The High Plains sunflower market. Presently, the High Plains has three major sunflower plants: one oilseed crush plant (near Goodland, Kansas) and two confection processors (one in Colby and one in Goodland). In the United States, three other major oil sunflower processing plants exist, with two in North Dakota (at Enderlin and West Fargo) and one in Minnesota (at Red Wing). Another major sunflower processing plant is scheduled to be operating in Lubbuck, Texas, during 2001-02. In addition, a number of smaller sunflower processing and birdseed packaging plants exist in Kansas and Colorado. Because of the geographic location of the U.S. High Plains, it holds a transportation cost advantage over the sunflower production areas in the northern United States for many domestic markets and for the export market to Mexico. Mexico was the largest importer of U.S. sunflower oil during 1995 through 2000, with an annual average of

Table 2. *Sunflower Grades and Grade Requirements*

Grade	Minimum test weight per bushel (lbs.)	Maximum limits of damaged sunflower seed (%) Heat damaged	Total	Dehulled seed
U.S. No. 1	25.0	0.5	5.0	5.0
U.S. No. 2	25.0	1.0	10.0	5.0

U.S. Sample Grade

This is sunflower seed that

(a) does not meet the requirements for the grades U.S. No. 1 or No. 2;

(b) contains eight or more stones which have an aggregate weight exceeding 0.20 percent of the sample weight, two or more pieces of glass, three or more crotalaria seeds (*Crotalaria spp.*), two or more castor beans (*Ricinum communis L.*), four or more particles of unknown foreign substance(s), 10 or more rodent pellets, bird droppings, or equivalent quantity of other animal filth per 600 grams of sunflower seed; or

(c) has a musty, sour, or commercially objectionable foreign odor; or

(d) is heating or otherwise distinctly low quality.

Note: The USDA standard for dockage of confection sunflower includes any whole sunflower seed that sizes through a 10/64 round-hole sieve. The common standard in the High Plains sunflower industry is any whole sunflower seed that sizes through a 14/64 round hole sieve. That standard may vary from company to company depending on market demand and other factors.

Table 3. *Effect of Sunflower Oil Content on Prices and Net Income ($10 per cwt. base)*

Oil content	Premium or discount	Net price per acre	Gross income [1]	Net income [2]	Difference
46%	+ 12.0%	$11.20	$168.00	$69.79	$18.00
44%	+ 8.0%	10.80	162.00	63.79	12.00
42%	+ 4.0%	10.40	156.00	57.79	6.00
40%	0.0%	10.00	150.00	51.79	[base]
38%	– 4.0%	9.60	144.00	45.79	– 6.00
36%	– 10.0%	9.00	135.00	36.79	– 15.00
34%	– 16.0%	8.40	126.00	27.79	– 24.00

[1] Based on 1,500 lb. seed yield per acre.
[2] Based on $85.12 total cash cost per acre, excluding land rent or interest charges and machinery depreciation and interest.
Source: *2000 Oil-type Sunflowers Cost- return Budget (W-SF-F Rotation) in Western Kansas* , MF-887.

Table 4. *Effect of Confectionary Sunflower Seed Size on Price and Net Income ($15/7 per cwt. — dual scale)*

Sizing over 20/64 sieve	Net price	Gross income [1]	Net income [2]	Difference
		---------- Dollars per acre ----------		
75%	$13.00	175.50	62.39	10.80
65%	12.20	164.70	51.59	[base]
55%	11.40	153.90	40.79	– 10.80
45%	10.60	143.10	29.99	– 21.60

[1] Based on 1,350-pound seed yield per acre.
[2] Based on $113.11 total cash cost per acre, excluding land rent or interest charges, or machinery depreciation and interest.
Source: *Confectionary Sunflowers Cost- return Budget (W-SF-F Rotation) in Western Kansas* , MF-937.

141,606 metric tons valued at $82,554,000 annually. These figures amounted to 40 percent and 41 percent of total U.S. sunflower seed oil quantity and dollar value of exports during 1995 through 2000. Average total U.S. sunflower seed oil exports for the same period were 343,141 metric tons, per valued at $204,103,500 annually. Other major consistent U.S. sunflower seed importers from 1995 through 2000 include Algeria, Canada, Egypt, Guatemala, the Netherlands, and Taiwan.

In addition to the sunflower processors who contract and buy from High Plains producers, many local elevators also handle sunflower. Many of these elevators are located in the western third and north central parts of the Kansas and in eastern Colorado, and typically deal in oil sunflower. Elevators usually compare oil-type sunflower seed bids from competitive sunflower crushers, exporters, and birdseed packagers, and then make sales to the sunflower seed user that offers them the highest price net of transportation and handling costs.

Delivering Sunflower

Because of sunflower's distinct markets, and the fact that sunflower producers deal directly with processors more than with other High Plains crops, it is critical for producers to know the quality of sunflower they produce and deliver. Many factors can affect sunflower quality, and therefore its value, including oil content, seed size, foreign material, dockage, insect damage, moisture content, test weight, and kernel color or smell. Some of these factors are more relevant to oil sunflower and others pertain more to confection sunflower. Price premiums may result from large seed size and high oil content, while low oil content, small seed size, and low test weight can lead to price discounts. Quality factors such as high foreign material levels, insect damage and infestation, small seed size, the presence of sclertina mold, and high moisture content can lead to reductions in pounds of sunflower sold or to the rejection of entire sunflower seed truck loads or lots. This section examines some sunflower seed quality factors, and illustrates the potential impacts they have on sunflower enterprise profits. The official Federal Grade Standards for sunflower are included in Table 2.

Oil content. Generally, 80 percent of oil sunflower's value is from oil. As a result, it is most often priced based on oil content of the sunflower seed. The standard is 40 percent oil, with price premiums paid for higher oil levels and price discounts for lower oil content. A sample oil sunflower price premium scale is presented below:

A premium of 2 percent of the price for each 1 percent over 40.0 percent. A discount of 2 percent of the price for each 1 percent under 40.0 percent to 38.0 percent, a discount of 3 percent for each 1 percent under 38.0 percent to 32.0 percent, and 3.5 percent for each 1 percent under 32.0 percent. All percentages are prorated.

The effect of this oil content based pricing scale on per acre profits is shown in Table 3. It illustrates the importance of production factors that affect sunflower oil content, such as date of planting and variety selection. The two-year average oil percentage content in

Table 5. *Effect of Foreign Material and Dockage on Sunflower Pay Weight per Acre* [1]

Total delivered pounds	FM and dockage	FM and dockage (pounds)	FM/dockage scale: 1-for-1 pay wt. [2] (pounds)	FM/dockage scale: > 1-for-1 pay wt. [3] (pounds)
1,500	0%	0	1,500	1,500.0
1,579	5%	79	1,500	1,500.0
1,667	10%	167	1,500	1,500.0
1,765	15%	265	1,500	1,447.0
1,875	20%	375	1,500	1,350.0
2,000	25%	500	1,500	1,240.0
2,143	30%	643	1,500	1,114.0

[1] Based on an oil sunflower seed yield of 1,500 pounds per acre.
[2] Pay weight calculated assuming a 1-percent dockage for each percentage point of FM and/or dockage.
[3] Pay weight calculated assuming a greater than one-for-one dockage: 1-percent dockage for each percentage point of FM and/or dockage up to 12 percent and a 2-percent dockage for each percentage point of FM and/or dockage greater than 12 percent.

Northwest Research-Extension Center Trials in 1999 and 2000 ranged from 35.9 percent to 41.9 percent for dryland sunflower, and 38.1 percent to 46.4 percent under irrigation.

Seed size. Confection sunflower prices are typically quoted on a dual scale: one price for large seeds (sizing over 20/64 inch round hole sieve) and a lower price for small seeds (sizing through a 20/64 and over a 14/64 inch round hole sieve). Therefore, the higher the percentage of large seeds in the lot, the greater the profit potential. Table 4 helps to illustrate this point on a per acre basis. In Northwest Research-Extension Center Trials during the 1999 and 2000 crop years, 44 percent of dryland confection sunflower seeds sized at or above 20/64 sieve. Under irrigation, 57 percent met this seed size criteria. Producers need to consider the production factors that affect seed size, such as planting date, variety, soil moisture, and plant population.

Foreign material and dockage. In general, sunflower foreign material and dockage will average between 5 and 10 percent. This amount of dockage is higher than for most other alternative crops, but still low enough to have relatively little impact on sunflower profitability. However, some instances of 20 percent foreign material and/or dockage have been reported. An understanding of how foreign material and dockage can potentially affect farmers' net income is important.

Foreign material and dockage refer to the amount of material in a load of sunflower that is not considered deliverable. Discounts are typically assessed by paying only for deliverable sunflower and not for the foreign material and/or dockage. For example, if a producer delivers a 4,000 lb. load that contains 5 percent foreign material and/or dockage, the processor will only pay for 3,800 lbs. of sunflower [4,000 lbs. less (5% x 4,000 = 200 lbs.)]. When exceptionally large amounts of foreign material are present, additional price discounts are often incurred. For example, one High Plains processor charges an additional discount of 1 percent of cash price for each 1 percent of foreign material more than 12 percent.

By definition, foreign material is "any and all material other than sunflower seed." Empty hulls and parts of seed are generally considered sunflower seed. Dockage is "all matter other than whole sunflower seeds containing kernels" (the meat of the sunflower). Dockage is a more strict definition which will often include hulls, broken and insect-damaged seeds, unsatisfactorily developed kernels, and extremely small seeds (for example, sizing through a 14/64 inch round hole sieve). Foreign material measures are typically used when assigning discounts to oil sunflower, since the empty hulls, parts of seed, and small seeds contain oil and can be crushed. Dockage is not used for confection sunflower since processors cannot use the empty hulls and damaged seeds in confection products.

From a strictly economic standpoint, foreign material and/or dockage typically have little effect on overall sunflower profitability. Profit will be affected

Table 6. *Effect of a One-for-One Discount for Foreign Material and Dockage on Sunflower Enterprise Income* [1]

Total delivered pounds	FM and/or dockage	Pay weight (pounds)	Selling price/cwt.	Gross income/acre [3]	Extra transportation cost [2]	Net income [3]	Difference
1,500	0%	1,500	$10.00	$150.00	$0.00	$51.79	$12.60
1,579	5%	1,500	10.00	150.00	0.40	45.79	6.60
1,667	10%	1,500	10.00	150.00	0.84	39.19	[base]
1,765	15%	1,500	9.70	145.50	1.33	27.34	– 11.85
1,875	20%	1,500	9.20	138.00	1.88	11.59	– 27.60
2,000	25%	1,500	8.70	130.50	2.50	– 5.21	– 44.40
2,143	30%	1,500	8.20	123.00	3.22	– 23.51	– 62.70

[1] Based on an oil sunflower seed yield of 1,500 pounds per acre.
[2] Calculated as 50 cents per hundredweight transportation cost for foreign material and dockage hauled.
[3] Gross income calculated using a price for oil sunflowers of $10/cwt. and net income calculated using $98.21 total cash cost per acre, excluding land rent or interest charges and machinery depreciation and interest. Source: *Oil-type Sunflowers Cost-return Budget (W-SF-F Rotation) in Western Kansas* , MF-887.

Table 7. *Effect of a Greater Than One-for-one Discount for FM and/or Dockage on Sunflower Enterprise Income* [1]

Total delivered pounds	FM and dockage	Pay weight (pounds)	Selling price/cwt	Gross income/acre [3]	Extra transportation cost [2]	Net income [3]	Difference
1,500	0%	1,500.0	$10.00	$150.00	$0.00	$51.79	$12.60
1,579	5%	1,500.0	10.00	150.00	0.40	45.79	6.60
1,667	10%	1,500.0	10.00	150.00	0.84	39.19	[base]
1,765	15%	1,447.3	9.70	140.39	1.33	22.93	– 16.26
1,875	20%	1,350.0	9.20	124.20	1.88	0.61	– 38.58
2,000	25%	1,240.0	8.70	107.88	2.50	– 21.33	– 60.52
2,143	30%	1,114.4	8.20	91.38	3.22	– 42.71	– 81.90

[1] Based on an oil sunflower seed yield of 1,500 pounds per acre.
[2] Calculated as $0.50 per cwt. transportation cost for foreign material and dockage hauled.
[3] Gross income calculated using a price for oil sunflowers of $10/cwt. and net income calculated using $85.12 total cash cost per acre, excluding land rent or interest charges and machinery depreciation and interest. Source: *Oil-type Sunflowers Cost-return Budget (W-SF-F Rotation) in Western Kansas* , MF-887.

only if the levels of foreign material and/or dockage are extremely high, incurring significant transportation costs for material that cannot be sold. In this case the processor assesses a greater than one-for-one discount resulting in a "discounted" pay weight — a pay weight less than the actual pounds of sunflower delivered. Table 5 illustrates the effects of varying levels of foreign material and/or dockage on pay weight, given two different discount scales. First, the one-for-one discount scale is shown where the processor pays only for the delivered sunflower. Second, a greater than one-for-one discount scale is shown in which the processor increases the discount for extremely high levels of foreign material and/or dockage. Foreign material and/or dockage do not affect the actual pounds of sunflower delivered. Also, foreign material and/or dockage have little effect on the pounds paid for unless the levels are extremely high and there is a greater than one-for-one discount for high levels, resulting in a discounted pay weight.

Table 6 shows how foreign material and/or dockage affect sunflower enterprise profits when a one-for-one discount is used. In this situation producers are paid for the actual quantity of delivered sunflower. Income is only reduced slightly by the added transportation costs. This table also illustrates the price and income effects from price discounts incurred at high levels of foreign material. In this example, an additional discount of 1 percent of cash price is charged for each 1percent of foreign material over 12 percent.

Table 7 portrays how foreign material and/or dockage affects profits when a greater than one-for-one discount is used. In this example, 1 percent dockage is assessed for each percentage point of foreign material and/or dockage up to 12 percent, and a 2 percent dockage is assessed for each percentage point of foreign material and/or dockage greater than 12 percent. Potentially large reductions in per-acre income occur when foreign material and/or dockage is high and a greater than one-for-one discount is in place.

The key management decision in this instance is to balance the level of harvest losses (seeds left in the field) and foreign material and/or dockage in the harvested sunflower. Some goals to strive for are to have 5 percent or less harvest losses and 10 percent or less foreign material and/or dockage. A key to decreasing dockage and increasing harvest efficiency is to harvest sunflower in a timely manner and to avoid letting the crop become too dry (i.e., 8 percent moisture or less). If environmental or other factors cause sunflower to become overly dry prior to harvest, then producers should harvest the crop while dew is present on the crop during the morning hours. During this time atmospheric moisture is likely to be higher, which will decrease the likelihood of shattering without adversely affecting seed moisture content. This management practice will decrease the incidence of head breakup during harvest, which is a primary cause of dockage in harvested sunflower.

Two sunflower production and marketing issues in the High Plains are a) contamination from volunteer corn or soybean seed, and b) the occurrence of dark roasted kernels. Seed contamination has become a problem as more intensive dryland crop rotations are being used in the region. These intensive crop rotations often include sunflowers along with corn and soybeans, increasing the potential for volunteer corn or soybean seed to be included with the harvested sunflower seed. While corn and soybean seed are difficult to sieve and separate out from sunflower seed, small grain crops do not present this problem. Dark roasted sunflower seed kernels can occur when sunflowers are harvested at a higher than normal moisture content. Higher moisture levels in storage can cause quality deterioration in sunflower seed nut meat. When these sunflower seeds are roasted and salted, there is a deterioration in seed appearance but not necessarily in taste. If sunflower seed is harvested at dry moisture levels and stored at cool temperature, no quality deterioration is expected.

A good source of additional information concerning sunflower production, harvesting, and storage is the "High Plains Sunflower Production Handbook," provided by K-State Research and Extension, MF-2384.

Test weight. A standard bushel of sunflower weighs 28 pounds. To qualify for the U.S. No. 1 or 2 grade sunflower must weigh a minimum of 25 pounds. Confection sunflowers usually have lower test weights than oils because of their larger seed size. In the 1999 and 2000 K-State Research and Extension Variety Trials at Colby, Kansas, oil sunflower had average test weights of 26.1 and 27.3 pounds per bushel under dryland and irrigated conditions, respectively. Confection sunflower had average test weights of 20.3 and 20.8 pounds in the same set of 1999 and 2000 dryland and irrigated yield trials. Low sunflower seed test weights sometimes results in price discounts. For example, there may be a 1 percent discount for each 0.5 pounds per bushel under a predetermined minimum test weight (such as 25 pounds for oils and 19 pounds for confection). Producers should consider test weight as a factor when selecting sunflower varieties to plant and the planting date. Generally, test weight is not as important in sunflower seed variety selection as sunflower seed oil content or seed size.

Moisture content. The majority of High Plains sunflower is harvested at moisture levels near 9 percent. This is regarded as a safe moisture level for post-harvest storage. In most years excessive moisture content is not a problem for High Plains sunflower seed producers. When moisture levels exceed 10 percent, discounts will be applied either as a reduction in price paid or as a reduction in the pounds paid for. In some forward contracts, the producer may be responsible for the cost of drying sunflower down to the 10 percent level. Moisture levels in excess of 12 percent are often accepted only at the buyer's discretion.

Other types of damage to sunflower seed. While small amounts of heat damage to sunflower are acceptable (0.5 percent), price discounts of 2 percent for each additional 1 percent of heat damaged kernels from 0.5 percent to 5 percent are charged by some High Plains processors. Heat damage on sunflower is most often associated with grain deteriorating in storage. Such damage is possible when grain is placed in storage at relatively high moisture levels and is subsequently caused to respirate at a high rate by high temperatures. Beyond levels of 5 percent heat damage, sunflowers may be subject to rejection by the buyer. Insect infestations may also trigger sunflower price deductions. In some cases, a uniform 3 percent decrease in price may be charged if sunflowers are infested with either brand bugs or grain weevils. Processors will not accept sunflower seed that has commercially objectionable foreign odors, such as odors from commercial fertilizer, skunks, or undissipated fumigants. Price discounts for poor sunflower quality may occur for the existence of sour or musty odors, often caused by mold formation in storage. Producers should check with potential buyers regarding their sunflower seed premium and discount schedules.

Sunflower Selling Alternatives for Producers

Sunflower is priced on a per hundred weight basis. The marketing alternatives and tools available to producers fall into four broad categories: cash sales, forward cash contracts (FCC), forward cash "grower" contracts (FCGC), and cross hedges based on soybean oil futures. While most sunflower is sold using one of these four basic marketing alternatives, producers should note that sunflower markets are varied, and that contract arrangements will differ by processor, by year, and in accordance with changing sunflower market and crop conditions.

Cash sales. Cash sales can be used to market both oil and confection sunflower. As with cash sales for other High Plains crops, producers can deliver their sunflower to the buyer and receive the "spot" or current cash price adjusted for any appropriate premiums or discounts based on the quality of the delivered sunflower. In some instances, the buyer will quote a price for sunflower "on the farm," resulting in a price adjusted for transportation costs.

Forward cash contracts (FCC). Relatively standard forward cash contracts are often used in contracting regular oil sunflower. These cash contracts are similar to and sometimes exactly the same as the forward cash contracts used for wheat, corn, and other commodities. These contracts require producers to deliver a preset number of pounds to the elevator or crush plant at a specified time, while allowing the producer complete freedom in regard to crop production decisions. The forward cash contract price is predetermined, but it is subject to premiums or discounts associated with sunflower seed quality.

If for any reason producers cannot fulfill the delivery obligations of a forward cash contract with their own production, they can buy sunflower seed from the elevator or another producer to make delivery with or they can buy out the contract. This "buy out" or settlement price is the difference between the going market price at delivery and the forward contracted price. For example, a situation could occur where a producer forward cash contracted 10,000 pounds of sunflower at $10 per hundred weight for delivery in

Table 8. *Cross-hedge Estimates for Hedging Northwest Kansas Sunflowers in Soybean Oil Futures*

Soybean oil futures contract month	Sunflower-soy oil hedge ratio [1]	Sunflower cwt. hedged per 600-cwt. soybean oil contract
January	0.554	1,083
March	0.629	954
May	0.689	871
July	0.580	1,034
August	0.533	1,126
September	0.578	1,038
October	0.529	1,134
December	0.565	1,062

[1] Graff, et al., *Cross Hedging Agricultural Commodities* , Kansas State University, 1997. Models are based on weekly cash price and soybean oil futures prices during the January 8, 1986, through April 23, 1997, period.
[2] The overall average hedge ratio across all contract months was 0.58.

October, but then in October did not have enough sunflower seed production to deliver to fulfill the forward contract obligation. If prices in October were $12 per hundred weight, the producer could "buy out" the contract for $2 per hundred weight ($12 market price less the $10 FCC) for a total of $200. Conversely, if prices in October were $8 per hundred weight (less than the FCC price of $10), the producer would have no problem fulfilling the obligations of the contract by purchasing lower priced sunflower from other growers and delivering it to fulfill the forward contract commitment. A sample forward cash contract is included in Appendix B.

Forward cash grower contracts (FCGC). This type of contract is typically used for specialty-niche crops such as confection or high-oleic oil sunflower. Like conventional forward cash contracts (FCC), forward cash grower contracts (FCGC) typically commit producers to deliver a preset number of pounds to a processing plant. FCGSs differ from FCCs in four primary ways:

1. They are acreage contracts which state a minimum number of acres that the producer and processor agree will be planted in order to meet the production or total pound commitment specified in the contract. Production on the contracted acres over and above the quantity specified in the contract is generally committed to the contracting processor for sale at the cash price available at the time of delivery.
2. Because of the importance of seed quality in specialty/niche markets, processors typically require the producer to purchase specific seed varieties to be planted on the contracted acres. These processors often provide agronomic recommendations to help producers grow a high quality sunflower crop.
3. These contracts often contain "Act of God" clauses which excuse the producer from performance of the contract in instances where acts beyond the producer's control destroy the crop (fire, drought, accidents, etc.). This clause is made available because the type of sunflower production being contracted for is often unique in quality and potentially not replaceable from the production of other sunflower growers. This clause eliminates a source of risk from the producer (i.e., the risk associated with producing less than forward contract commitments), but presents an additional risk for the processor (i.e., being short of supplies for processing and marketing commitments).
4. These contracts are sometimes considered "buyer's call" contracts, in which producers are required to store the crop for a period of time after harvest until the time period during which the buyer requires delivery. The contracting processor will typically provide a storage credit or price premium to help cover the cost of storage and interest until the time when the processor requires delivery.

Table 9. *Forecast Models for Northwest Kansas Oil Sunflower Prices Using Soybean Oil Futures*

Soybean oil futures contract month	Cash sunflower price forecast models for northwest Kansas [1]	RMSPE [2]
January	Oil SF cash $\$_{Jan}$ = \$2.96 + (0.554 × soy oil futures $\$_{Jan}$)	13.56%
March	Oil SF cash $\$_{Mar}$ = \$4.57 + (0.629 × soy oil futures $\$_{Mar}$)	14.19%
May	Oil SF cash $\$_{May}$ = \$5.84 + (0.689 × soy oil futures $\$_{May}$)	13.24%
July	Oil SF cash $\$_{July}$ = \$3.23 + (0.580 × soy oil futures $\$_{July}$)	14.40%
August	Oil SF cash $\$_{Aug}$ = \$2.07 + (0.533 × soy oil futures $\$_{Aug}$)	12.19%
September	Oil SF cash $\$_{Sep}$ = \$2.56 + (0.578 × soy oil futures $\$_{Sep}$)	12.72%
October	Oil SF cash $\$_{Oct}$ = \$2.02 + (0.529 × soy oil futures $\$_{Oct}$)	11.46%
December	Oil SF cash $\$_{Dec}$ = \$3.09 + (0.565 × soy oil futures $\$_{Dec}$)	10.83%

[1] Graff, et al., *Cross Hedging Agricultural Commodities* , Kansas State University, 1997. Models are based on weekly cash price and soybean oil futures prices during the January 8, 1986, through April 23, 1997, period.
[2] RMSPE stands for "root mean square percentage error," indicating that the models forecast error as a percentage of the respective average sunflower price. A price forecast is expected to fall within 1 RMSE of the forecast price 67 percent of the time.

A sample forward cash grower contract is shown in Appendix C.

Cross hedges. Hedging can be defined as "selling (or buying) futures in advance of a later cash sale (or purchase) of a commodity produced (or used) in a business operation." For crop producers, this specifically means selling futures in advance of later cash sales. When the crop is harvested and sold in the cash market, the futures contract is bought back to close out the futures hedge position. If the futures market price declines after the initial preharvest futures sale, losses in the cash market are offset by gains in the futures market (which were initially sold at a high price and bought back at a lower price). Conversely, if the futures market price rises after the initial preharvest futures sale, losses in the futures market (which were initially sold at a lower price than they were bought back for) are offset by gains in the cash market.

Local sunflower basis is a key factor in hedging strategies. Basis is defined as the difference between cash and futures prices. For more information on basis, see the publication "Basis: The Cash/Futures Price Relationship," MF-1003, K-State Research and Extension. When supply and demand factors affect both cash and futures markets in similar and relatively predictable ways, then basis is less variable and the likelihood of having a successful hedge is greater. Hard red winter wheat in Kansas and other High Plains states can be hedged successfully because the same market fundamentals that affect Kansas City Board of Trade wheat futures also tend to affect local cash wheat prices, resulting in basis levels that are relatively predictable from year to year.

Hedging oil sunflower differs from hedging wheat because no specific futures contract for sunflower seed exists. Sunflower producers can use Chicago Board of Trade (CBT) soybean oil futures to "cross hedge" their sunflower prices. Although cross hedging may be used successfully, it does involve more basis risk than for other cash commodities that have matching futures contracts (such as hard red winter wheat in the High Plains). While sunflower seed and soybean oil are both part of the oilseed market complex, the market fundamentals that influence soybean oil prices do not always influence sunflower seed and sunflower oil prices in the same direction or magnitude. There may even be short periods of time when soybean oil and sunflower seed and/or oil prices may move in opposite directions. This may be caused by variability in weather conditions between world sunflower growing regions that tend to be geographically concentrated versus world soybean production regions that tend to be more widely dispersed geographically. Also, demand for alternative types of oilseed oil may vary since these products tend not to be perfect substitutes for one another.

Another important factor in cross hedging oil sunflower with CBT soybean oil futures is determining what "hedge ratio" to use. A hedge ratio of 1.0 is used for cash commodities that have an associated futures contract. For example, for a Kansas producer to hedge 5,000 bushels of hard red winter wheat, the producer would sell 5,000 bushels of KCBT wheat futures in the appropriate futures contract month. Because cash sunflower seed prices do not change in an exact one-for-one relationship with CBT soybean oil futures, a hedge ratio different than 1.0 is needed for cross hedging purposes. This ratio represents the ratio of the quantity of sunflower seed production to be cross hedged by selling a certain quantity of CBT soybean oil futures. In past years, the sunflower industry has typically used a ratio of 0.5 (120,000 pounds of sunflower for every 60,000 pounds of CBT soybean oil futures contract) for cross hedging cash sunflower seed prices. At yields of 1,500 pounds per acre, 120,000 pounds represents 80 acres of sunflower seed production.

A Kansas State University study found that an average hedge ratio of 0.58 has been effective in cross hedging northwest Kansas sunflower prices with soybean oil futures (Graff, et al., 1997). Table 8 illustrates how the northwest Kansas hedge ratio varies using weekly prices for cash sunflower and alternative soybean oil futures contract months during the January 8, 1986, through April 23, 1997, period. The hedge ratio and the quantity of sunflower effectively hedged per 600 hundred weight for the March soybean oil futures contract is found in Table 8. Because the March hedge ratio is 0.629, the amount of cash sunflower seed quantity hedged is approximately 954 hundred weight (600 hundred weight / 0.629). An October soybean oil futures hedge has a hedge ratio of 0.529, indicating that the cash sunflower quantity to be hedged per 600 futures contract is approximately 1,134 hundred weight.

In summary, cross hedging is an available marketing alternative that producers should use with caution until they are familiar with the mechanics and procedures involved in making futures hedges.

Sunflower Price Forecasts

Forecasts of sunflower prices may be useful to producers in forming the sunflower price expectations they use in their production, marketing, and financial plans. Oil sunflower cash price forecasting models were developed for northwest Kansas by Graff, et al. (Table 9). These models depend solely on CBT soybean oil futures prices to predict cash oil sunflower prices.

This is consistent with actual practice, as sunflower oil prices are the primary determining factor for sunflower seed prices, and sunflower oil prices typically are closely aligned with soybean oil prices. Separate sunflower cash price prediction models are presented for each available soybean oil futures contract.

For example, if the October 2001 soybean oil futures price in July 2001 is $16.42 per hundred weight, then the October model indicates that the expected October 2001 cash sunflower price is $6.67 in northwest Kansas [–$2.02 + (0.529 × $16.42)]. These models explained from 72 percent to 81 percent of the variability in weekly oil sunflower cash prices during 1986 through early 1997. Their forecast errors as a percent of average sunflower cash prices ranged from 10.83 percent to 14.19 percent. In the October 2001 forecast example, if prices averaged $6.67 during October for 1986 through 1997, then there is a 67 percent probability that actual October '01 oil sunflower cash price will be within the $5.91 to $7.43 range (i.e, within + / – 11.46% × $6.67, or + / – $0.76 of the October 2001 price forecast of $6.67 per cwt.).

These models do not account for the impact of the Sunflower Oil Assistance Program (SOAP) on U.S. sunflower oil exports during 1987 through 1993. These export subsidies may have skewed the traditional price relationships between sunflower seed and soybean oil. The SOAP program may have been partially responsible for large price premiums that periodically existed at the U.S. Gulf of Mexico export locations for sunflower oil relative to soybean oil during the period (Source: National Sunflower Association, 2001).

Other sunflower seed price forecasting models have been developed using both sunflower oil and sunflower meal prices. The following U.S. sunflower seed cash price model developed by O'Brien uses U.S. monthly average cash sunflower oil and sunflower meal prices for October 1985 through September 2000. A variable is also included to measure the effect of the 1988/89 through 1990/91 marketing years on monthly average cash sunflower seed prices. All prices are on a $ per hundred weight basis.

$$\text{Oil-SF Cash\$} = -0.39 + (0.34 \times \text{SF-Oil Cash\$}) + (0.60 \times \text{SF-Meal Cash\$}) + (0.55 \times \text{Mktg Years: 88-90})$$

Changes in sunflower oil and meal cash prices and the unique effect of the 1988 through 90 marketing years explained 77 percent of the variation in U.S. cash sunflower seed prices during October 1985 through September 2000. This model had a standard error of $1.03 per hundred weight, indicating there is a 67 percent probability that the price model is accurate within + / – $1.03. If for a particular month sunflower oil prices are projected to be $15.00 per hundred weight and sunflower meal prices are projected to be $80 per ton ($4.00 per hundred weight), then this model would forecast that month's average sunflower seed prices to be $7.11 [-0.39 + (0.34 × $15.00) + (0.60 × $4.00) + (0.70 × 0)]. This price forecast would be expected to fall within the range of $6.08 to $8.14 ($7.11 + / – $1.03) with 67 percent accuracy. If a producer or processor has estimates of future sunflower oil and meal prices, then this model provides another source of sunflower seed forecast information for use in management decisions.

Sunflower Market Information

Information about sunflower prices is critical when making planting and marketing decisions. Elevators and processing plants that purchase sunflowers regularly provide current price quotes and forward bids directly to farmers. The USDA-Kansas Department of Agriculture Market News is a primary source of public sunflower market information. The goal of this cooperative arrangement between the Kansas State Board of Agriculture and USDA's Grain and Market News Service is to provide sunflower market information to sunflower producers in Kansas and the larger High Plains region. The "Kansas Sunflower Market Report" is a daily report containing price quotes from a number of oil-type, high-oleic, and confection sunflower buyers in Kansas. Another report, the "USDA Weekly National Sunflower Summary," contains High Plains and upper Midwest sunflower price information. Both reports are made available to newspapers, electronic data systems, and other news organizations for public distribution. Most of the newspapers that publish sunflower price quotations are located in western Kansas. Statewide coverage will likely expand if sunflower acreage expands into central and eastern parts of the state. The National Sunflower Association also provides a daily sunflower market summary and commentary. Information about daily oil sunflower prices for all plant locations, the Chicago Board of Trade soybean oil futures contract closes, and a short market commentary is available on a 24-hour basis by calling the National Sunflower Association at 701-328-5106.

Developing a Sunflower Marketing Plan

The process of marketing sunflower begins when planting decisions are made. Producers must compare the profit potential of alternative crops as well as of the

different kinds of sunflower (standard oil type, mid-oleic, high-oleic, confection, etc.). Their focus should be on sunflower price prospects and/or available forward contract prices, required delivery grades and standards, and the farmer's management expertise in producing each type of sunflower. Producers must accurately assess the likelihood that they will be able to produce sunflower seed that will qualify for the quality-based premiums offered.

Once harvest is completed, it is important that producers know the quality of the portion of their crop that has not already been directly delivered to a processor or an elevator. Producers should deliver their highest quality sunflower on the contract or to the spot market buyer paying the highest quality premiums. They can target their lower quality, uncontracted sunflower production to buyers with less discriminating sunflower quality standards. For example, low oil content sunflower may net a better price from birdseed packagers than from sunflower crushers.

For sunflower as well as other crops, it is important to develop a sound marketing plan. Developing a sunflower marketing plan should involve at least four steps:

Gathering Information

Gather the information necessary to make marketing decisions. Producers should be aware of current supply and demand fundamentals for sunflowers and other oilseeds. They also should be aware of current and historical sunflower prices and seasonal price patterns in their region. They should know the number of local buyers and the types of sunflowers they handle, as well as the cost to transport sunflower seed between them. Other information about producer's cost of production, projected net returns, and the availability and cost of storage is also needed to make farm production and financial management decisions.

Thinking Through Decisions

Once the necessary information is gathered, the production and marketing plan should be carefully thought through. Issues to consider relate to a) what type of sunflower production (oil, high-oleic, confection, etc.) works best for the producer; b) how much of expected annual production should be forward contracted prior to harvest; c) what quantity of noncontract production should be priced or sold at harvest versus how much should be stored for later sale; and d) what price level should a producer consider to be a "good" pricing opportunity. The sunflower production and marketing plan should be integrated into the producer's overall farm management plan. Plans should be made early, prior to the onset of fieldwork activities and other financial and market concerns.

Writing a Marketing Plan

Marketing plans should be written down to help producers be disciplined in their marketing decisions. Written marketing plans may need to be updated as crop and/or market conditions change. However, writing the plan down helps producers to follow the sound and integrated management plan they have developed for their farm.

Apply Marketing Discipline

Discipline is needed to monitor the progress of a marketing plan and to take action when predetermined marketing "triggers" are reached. Marketing plans should be periodically reevaluated and should allow for alternative contingency plans if major unanticipated changes occur in market conditions.

Sunflower Information from K-State Research and Extension

For more information about sunflower production and marketing, please contact your local K-State Research and Extension office. Specific information about marketing sunflower and other Kansas commodities is available through the Department of Agricultural Economics, Kansas State University, 342 Waters Hall, Manhattan, Kansas, 785-532-4493.

Appendix A

Table A. *U.S. Sunflower Seed Supply, Disappearance, and Price: 1980-81 through 2001-02*

Year (Sept. 1 – Aug. 31)	Supply				Disappearance					U.S. farm price ($/cwt.)	Loan rate [2]
	Beginning stocks	Production	Imports	Total supply	Crush	Non-oil use + seed	Exports	Total use	Ending stocks		
1980	896	1,697	28	2,621	780	154	1,505	2,439	182	$10.90	—
1981	182	2,035	32	2,249	374	177	1,555	2,106	143	10.80	—
1982	143	2,419	40	2,602	766	191	1,348	2,305	297	9.03	—
1983	297	1,451	31	1,779	590	112	1,044	1,747	32	13.00	—
1984	32	1,698	26	1,757	567	128	991	1,685	71	11.30	—
1985	71	1,430	26	1,527	674	276	365	1,315	213	7.93	—
1986	212	1,214	8	1,435	635	243	304	1,182	253	6.90	—
1987	253	1,183	10	1,446	900	80	270	1,249	197	8.34	—
1988	197	813	25	1,035	575	295	85	956	80	12.10	—
1989	80	798	20	898	546	230	96	872	26	10.60	—
1990	26	1,031	40	1,097	593	293	123	1,009	88	10.80	—
1991	88	1,639	75	1,803	952	444	144	1,540	262	8.69	$8.90
1992	262	1,163	47	1,473	923	363	118	1,404	69	9.74	8.90
1993	69	1,167	24	1,260	661	429	99	1,189	71	12.90	8.90
1994	71	2,193	42	2,306	1,313	604	287	2,203	103	10.70	8.70
1995	103	1,819	21	1,943	915	598	224	1,737	205	11.50	8.70
1996	205	1,614	18	1,838	844	648	149	1,642	196	11.70	8.91
1997	196	1,668	29	1,894	1,061	552	190	1,802	92	11.60	9.30
1998	92	2,392	34	2,518	1,178	850	260	2,287	231	10.60	9.30
1999	231	1,969	41	2,241	1,139	672	199	2,010	231	7.53	9.30
2000	231	1,626	57	1,914	964	676	175	1,815	99	6.65	9.30
2001[1]	99	1,657	61	1,817	866	692	172	1,730	87	7.65	9.30

[1] USDA forecast as of May 2001.
[2] Commodity loan coverage was not available for

Table B. *U.S. Sunflower Seed Oil Supply, Disappearance, and Price: 1980-81 through 2001-02 (1,000 metric tons)*

Year (Oct. 1 – Sept. 30)	Supply			Disappearance				SF Oil Price Minneapolis crude ($/cwt.)
	Beginning stocks	Production	Total supply	Domestic	Exports	Total use	Ending stocks	
1980	73	298	371	29	301	330	41	$26.94
1981	41	137	178	63	103	166	12	24.95
1982	12	303	315	43	229	272	43	22.45
1983	43	204	247	53	188	241	6	33.60
1984	6	219	225	65	130	195	30	30.00
1985	30	265	295	65	205	270	25	19.10
1986	25	266	291	84	156	240	51	16.01
1987	51	377	430	40	319	359	71	23.59
1988	71	235	306	57	212	269	37	22.68
1989	37	215	254	78	159	238	17	24.40
1990	17	243	275	91	163	254	21	23.60
1991	21	413	438	154	239	393	45	21.60
1992	45	331	376	85	266	351	25	25.30
1993	25	263	292	58	204	263	29	31.00
1994	29	528	558	78	444	521	37	28.20
1995	37	390	428	76	285	361	67	25.40
1996	67	381	458	94	322	416	42	22.55
1997	42	435	481	84	370	454	27	27.59
1998	27	534	563	145	363	508	55	20.25
1999	55	474	532	174	286	460	71	16.50
2000	71	419	492	186	245	431	61	15.75
2001[1]	61	376	440	170	231	401	39	18.00

[1] USDA forecast as of May 2001

Table C. *U.S. Sunflower Seed Meal Supply, Disappearance, and Price: 1980-81 through 2001-2002 (1,000 metric tons)*

Year (Oct. 1 – Sept. 30)	Supply			Disappearance				SF meal price – 28% protein ($/2000 lb.)
	Beginning stocks	Production	Total supply	Domestic	Exports	Total use	Ending stocks	
1980	4	439	447	440	NA	440	7	$110.68
1981	3	201	207	200	NA	200	7	106.14
1982	7	434	445	440	NA	440	5	101.98
1983	5	265	275	245	25	270	5	111.14
1984	5	321	331	312	14	326	5	52.86
1985	5	357	362	313	44	357	5	68.76
1986	5	305	315	268	42	310	5	76.56
1987	5	426	431	381	47	427	4	98.80
1988	4	291	307	298	6	304	3	122.47
1989	3	264	279	271	3	274	5	100.45
1990	5	293	316	306	5	312	5	88.00
1991	5	498	510	450	54	503	6	76.80
1992	6	440	451	401	48	449	2	89.00
1993	2	327	332	291	37	328	5	94.00
1994	5	653	658	565	89	653	5	65.05
1995	5	458	463	433	25	458	5	123.75
1996	5	440	445	419	21	440	5	110.60
1997	5	494	499	482	13	495	5	82.04
1998	5	617	621	576	41	617	5	65.40
1999	5	549	554	528	21	549	5	75.00
2000	5	476	481	467	9	476	5	83.20
2001[1]	5	431	435	422	9	431	5	73.80

[1] USDA forecast as of May 2001

Appendix B

SAMPLE — FORWARD CASH CONTRACT

This agreement entered into on this _____ day of _____, 20 ____, between _____ of _____, hereinafter designated as the Seller and LOCAL COOPERATIVE ASSOCIATION, (Anywhere), KANSAS, hereinafter designated as the Buyer.

WITNESSETH: The Seller has this date agreed to sell to the Buyer and the Buyer has agreed to buy from the Seller _____ bu./cwt. of _____ at $ _____ per unit less charges with sufficient and proper dockage, to be delivered sound and dry to the elevator of the Buyer, or substation thereof, not later than _____, 20 __. The Seller agrees that the above price is a base price and shall be adjusted to compensate for lower grades which may be delivered and accepted on this contract. This contract is made for the sole purpose of establishing the price stated herein for this commodity. The Seller hereby certifies that he is the sole owner of said commodity and that the same is free from all liens and encumbrances. This contract shall be nonassignable by both parties. It is further agreed that this contract shall be binding upon the heirs, administrators and executors of the respective parties hereto.

In consideration of the above agreement of the Seller to sell this commodity, it is agreed between the Seller and the Buyer that the Seller is to receive payment for this grain on _____, 20 ___.

The Seller warrants and promises to deliver the commodity called for herein immediately during or after the same and in the event of a calamity such as hail, storm, drought or otherwise, so that the Seller does not have on hand the grain, all of which is without his fault, then the Seller has the following options:

a) Buy equivalent commodity as called for in above and deliver to Buyer within a reasonable time such commodity but no later than _____, 20 ____.

b) Pay in cash to the Buyer the difference between the contract and the market price at date of settlement, the market price to be posed price at the elevator, at date of settlement, which shall not be later than _____,
20 _____, but in no event shall Buyer pay any cash to Seller.

WITNESS the hands of the parties hereto the date and year first above written.

_____ _____

Seller Witness

Appendix C

SAMPLE
FORWARD CASH GROWER CONTRACT

This agreement is made between CONFECTION PROCESSORS, INC. (hereinafter Buyer) and _____ (hereinafter Grower) whose address is _____.

1. This is a contract between Buyer and Grower whereby Buyer agrees to buy from Grower and Grower agrees to sell to Buyer _____ pounds of confection sunflower seeds as more particularly set forth below.

2. Buyer recommends, and Grower agrees, that _____ acres, at a minimum, will be planted to cover all the above stated contracted pounds. Grower agrees not to contract with any third party for production. If Growers production on all acres exceeds the pounds stated in item 1, Buyer will have the first right to purchase the excess production at the then prevailing market price.

3. Grower must provide a legal description of all confection sunflower acres planted.

4. Grower agrees to purchase his seed requirements from Buyer or its designated sellers.

5. Grower agrees that all sunflower seed produced under terms of this contract shall be delivered to and marketed through Buyer.

6. The base price will be $ _____/cwt. for all product over a 20/64 round hole screen and $ _____/cwt. for all product under 20/64 and over 14/64 screen. Any discounts will be charged according to the percentage of pounds received above and below a 20/64 screen. Grower is responsible for all charges including freight to delivery point.

Buyer will have sole discretion to determine when it will accept delivery of the contracted seed. Buyer agrees to call all previously uncalled seed no later than nine months after harvest. Buyer will attempt to take delivery during the month of _____. Buyer will pay Grower a storage credit of $ ____/cwt. per month on the undelivered portion of contracted production.

TERMS, STANDARDS, AND CONDITIONS

7. All seed will be purchased on a basis of unloaded weights and grades using the terms, standards, and conditions set forth:
   a. Foreign Material: All material in sample that is not sunflower seeds. A 1 percent dock for each 1 percent foreign material on total pounds up to a maximum of 12 percent foreign material. Then a 1.5 percent dock for each 1 percent foreign material over 12 percent and up to a maximum of 16 percent. Then a 2 percent dock for each 1 percent foreign material over 16 percent and up to a maximum allowable of 25 percent foreign material. Over 25 percent foreign material, Buyers option.
   b. Lights: Considered part of the foreign material poundage. Lights are any seed with no kernel or an unsatisfactorily developed kernel.
   c. Insect Damage: Considered part of foreign material poundage, all insect damage will be added to the foreign material.
   d. Cracked and Broken kernels: Considered part of the foreign material poundage and will be added to the foreign material.
   e. Burrs of any kind: Considered part of the foreign material poundage and will be added to the foreign material.
   f. Seeds passing through a 14/64 round hole screen: Considered part of the foreign material poundage and will be added to the foreign material.
   g. Sclerotinia: Automatic rejection of the load or Buyers option.
   h. Moisture: 10 percent or less will be considered dry and have no dock. Dock will be a 2 percent dock on each 1 percent on total pounds of moisture percentages over 10 percent and up to a maximum allowable of 12 percent. Grower will also be liable for all drying and associated charges, including handling charges, on all moisture levels over 10 percent. Any moisture over 12 percent, Buyer's option.

Any load not meeting the above specifications may be rejected without canceling the contract in its entirety, or at Buyers discretion, accepted and discounted at market rates.

8. Fire, strikes, accidents, acts of God or public enemy, or other causes beyond the control of the parties hereto shall excuse them from the performance of this contract; provided, however, that should any event occur, either party must notify the other party within ten (10) days of the event by certified mail.

GROWER GUIDELINES

9. Grower agrees:
   a. To follow good cultural practices, including appropriate crop rotation.
   b. To bear all production expenses and all decisions related thereto.
   c. This contract is not a partnership nor a joint venture between Grower and Buyer.
   d. To warrant that there will be no undisclosed liens on said products when delivered to Buyer. If liens exist, it is Buyer's option to pay the lien, which shall be subtracted from any money owed by Grower to Buyer.

THIS AGREEMENT WHEN SIGNED BY GROWER AND GROWERS LANDLORD, IF APPLICABLE, IS AN OFFER TO MAKE A CONTRACT. NO CONTRACT WILL ARISE UNTIL THIS AGREEMENT IS RECEIVED BY AND SIGNED BY BUYER.

GROWER MAY NOT ASSIGN ANY OF HIS OBLIGATIONS UNDER THIS AGREEMENT WITHOUT THE PRIOR WRITTEN CONSENT TO BUYER. THIS CONTRACT CANNOT BE AMENDED EXCEPT BY WRITTEN AGREEMENT SIGNED BY OTHER PARTIES. HAVING FIRST READ AND UNDERSTOOD THE ABOVE, EACH PARTY TO THE CONTRACT ACKNOWLEDGED HIS/HER ACCEPTANCE OF THE ABOVE TERMS AND CONDITIONS OUTLINED HEREIN.

THIS DOCUMENT WHEN ACCEPTED BY BUYER SHALL CONSTITUTE THE ENTIRE AGREEMENT BETWEEN THE PARTIES.

GROWER _____ DATE _____ LIENHOLDER _____

WITNESSED _____ BY: CONFECTION PROCESSORS, INC. _____

DATE _____

Daniel O'Brien
Agricultural Economist – Northwest Kansas

Roger Stockton
Crops and Soils Specialist – Northwest Kansas

Dana J. Belshe
Agricultural Agent Sherman County

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

L-887 September 2001