

10-1957

CC159 Grain Sorghum : Should I Dry and Store or Sell at Harvest?

Philip A. Henderson

Everett E. Peterson

Follow this and additional works at: <http://digitalcommons.unl.edu/extensionhist>

Henderson, Philip A. and Peterson, Everett E., "CC159 Grain Sorghum : Should I Dry and Store or Sell at Harvest?" (1957). *Historical Materials from University of Nebraska-Lincoln Extension*. 3127.
<http://digitalcommons.unl.edu/extensionhist/3127>

This Article is brought to you for free and open access by the Extension at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Historical Materials from University of Nebraska-Lincoln Extension by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

grain sorghum

UNIVERSITY OF NEBRASKA
LINCOLN

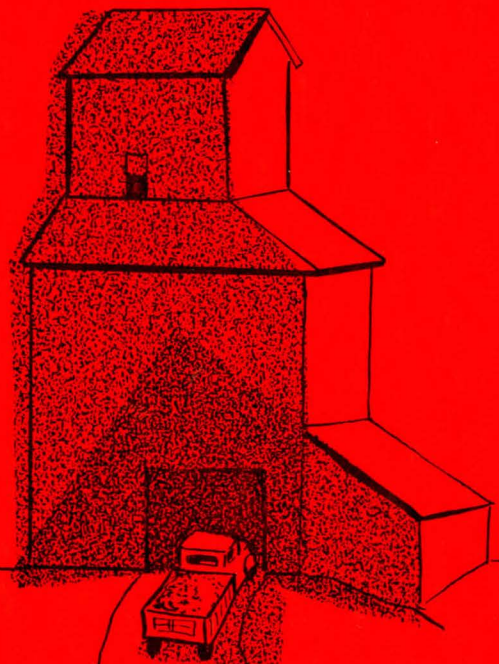
NOV 3 1968

SHOULD I.....

RECEIVED
DEC 2 1970
COLLEGE OF AGRICULTURE
LIBRARY
STAC'S



dry and store? or



sell at harvest?

EXTENSION SERVICE
UNIVERSITY OF NEBRASKA COLLEGE OF AGRICULTURE
AND U.S. DEPARTMENT OF AGRICULTURE
COOPERATING
W. V. LAMBERT, DIRECTOR

GRAIN SORGHUM-SHOULD I DRY AND STORE
OR SELL AT HARVEST?

by

Philip A. Henderson and Everett E. Peterson ^{1/}
Extension Economists, University of Nebraska

Nebraska farmers have several choices in handling their 1957 grain sorghum crop. It can be sold on the market at harvest time for whatever it will bring. With a moisture content of not over 15 percent and storage temperature below 50°, it can be stored temporarily and sold or fed to livestock before warm weather next spring. If the moisture content is less than 13 percent, it can be stored and a government loan or purchase agreement taken out on it. Using the loan-and-storage method will usually mean on-the-farm storage because space will be very scarce in commercial warehouses this fall and winter.

Price support can be obtained on grain sorghum even though a farmer may not have complied with his acreage allotments on corn or wheat, provided that his storage facilities and grain meet U.S.D.A. requirements. The 1957 loan rate for farm-stored grain sorghum (grading U. S. No. 2 or better with not over 13 percent moisture) varies from \$1.59 a cwt. in Sioux County to \$1.95 in Sarpy County. The map shows the loan rates for all Nebraska counties.

The moisture content of much of our grain sorghum will be over 13 percent when harvested this fall. Moisture content and keeping qualities are affected by:

- (1) How much the crop dries in the field before harvesting;
- (2) Cleanliness of the combining job in removing green weeds and stalk pieces;
- (3) Amount of cracked kernels in the combined grain.

If "wet" grain is sold to an elevator, it will be subject to a discount of 5-6 cents per cwt. for each one percent of moisture, and 10-12 cents for each percentage point above 18 percent, according to preharvest estimates. These discounts are charged because of shrinkage in drying and risk of loss from spoilage. Shrinkage due to drying grain sorghum down to 12 percent moisture is shown in Table 1.

Sell at Harvest or
Dry and Store?

The farmer who produced grain sorghum as a cash crop can sell it direct from the combine for the current market price less the appropriate moisture discount, or he can dry it to 13 percent or less moisture, store it and take a loan on it. The U. S. grain sorghum crop is 2½ times that of last year. Here in Nebraska we'll produce about six times as much as in '56. This means that the market price will run below the loan rate during the 1957-58 marketing season and much lower at harvest time.

^{1/} Arlen Lutz, Extension Agent-at-Large, and M. L. Mumgaard, Extension Agricultural Engineer, Univ. of Nebr. provided technical data used in this circular.

Availability Period, Loans and Purchase Agreements ends 1-31-50
 Maturity Date - On Demand but not later than 3-31-58

NEBRASKA - 1957 GRAIN SORGHUMS LOAN AND PURCHASE AGREEMENT RATES

Basis - CWT. US #2 or better
 Moisture not in excess of 13%

Sioux 1.59	Dawes 1.62	Sheridan 1.65	Cherry 1.70			Keya Paha 1.74	Brown 1.74	Rock 1.75	Boyd 1.78	Holt 1.80	Knox 1.80	Cedar 1.82	Dixon 1.85	Dakota 1.87
	Box Butte 1.65									Antelope 1.83	Pierce 1.85	Wayne 1.83	Thurston 1.89	
Scotts Bluff 1.61	Morrill 1.64	Garden 1.66	Grant 1.67	Hooker 1.70	Thomas 1.73	Blaine 1.74	Loup 1.79	Garfield 1.80	Wheeler 1.85	Boone 1.85	Madison 1.86	Stanton 1.87	Cuming 1.90	Burt 1.91
Banner 1.63			Arthur 1.67	McPherson 1.73	Logan 1.74		Custer 1.78	Valley 1.80	Greeley 1.84	Nance 1.86	Platte 1.88	Colfax 1.90	Dodge 1.92	Wash. 1.93
Kimball 1.67	Cheyenne 1.67	Deuel 1.67	Keith 1.67	Lincoln 1.72				Sherman 1.81	Howard 1.83	Merrick 1.86	Polk 1.87	Butler 1.90	Saunders 1.93	Douglas 1.94
			Perkins 1.73			Dawson 1.78	Buffalo 1.81	Hall 1.83	Hamilton 1.85	York 1.87	Seward 1.90	Lancaster 1.92	Otoe 1.91	Sarpy 1.95
			Chase 1.71	Hayes 1.73	Frontier 1.78	Gosper 1.81	Phelps 1.82	Kearney 1.83	Adams 1.85	Clay 1.86	Fillmore 1.89	Saline 1.91	Gage 1.92	Johnson 1.92
			Dundy 1.71	Hitchcock 1.74	Red Willow 1.78	Furnas 1.80	Harlan 1.82	Franklin 1.83	Wobster 1.85	Nuckolls 1.86	Thayer 1.88	Jefferson 1.90	Pawnee 1.93	Nemaha 1.91
													Richardson 1.93	

REVISED
 OCTOBER 1, 1957

1957 TERMINAL LOAN RATES - Atchison, Kansas City, St. Joseph, Mo., \$2.31, Omaha, Nebr. and Sioux City, Ia., \$2.23 per cwt., U.S. #2 or better under 13% moisture (Discounts same as shown).
 FARM STORAGE LOAN RATES - As shown on map for #2 or better, under 13% moisture, applicable discounts for other eligible grades shown below, to be deducted from #2 rate.

WAREHOUSE STORAGE LOAN RATE DEDUCTIONS
 Where the date of deposit (the date of the warehouse receipt if the date of deposit is not shown) on warehouse receipts representing grain sorghums stored in warehouses operating under the Uniform Grain Storage Agreement is on or before March 31, 1958, the storage charges per 100 pounds shown in the following table shall be deducted in computing the amount of the loan, unless*
 *written evidence, signed by the warehouseman of the storing warehouse, has been submitted with the warehouse receipt that all warehouse charges, except receiving & loading out charges have been prepaid through maturity date, March 31, 1958.

DATE OF DEPOSIT	AMT. OF DEDUCTION (cents per cwt.)
Oct. 9 - Oct. 20, 1957	14
Oct. 21 - Nov. 1, 1957	13
Nov. 2 - Nov. 13, 1957	12
Nov. 14 - Nov. 25, 1957	11
Nov. 26 - Dec. 7, 1957	10
Dec. 8 - Dec. 19, 1957	9
Dec. 20 - Dec. 31, 1957	8
Jan. 1 - Jan. 12, 1958	7
Jan. 13 - Jan. 24, 1958	6
Jan. 25 - Feb. 5, 1958	5

DATE OF DEPOSIT	AMT. OF DEDUCTION (Cents per cwt.)
Feb. 6 - Feb. 17, 1958	4
Feb. 18 - March 1, 1958	3
March 2 - March 13, 1958	2
March 14 - March 31, 1958	1

DISCOUNTS	
#3 under 13% moisture	5
#4 under 13% moisture	10
Mixed	3
Smutty	5
Discolored	7

GRAIN SORGHUM (Cents per cwt.)

REFUND OF "PREPAID HANDLING CHARGES" - Upon delivery, on or after maturity date, of grain sorghums under loan or purchase agreement to CCC, if the producer furnishes to the county committee written evidence, signed by the warehouseman of the storing warehouse, that such charges have been paid, he shall be reimbursed (in the case of a loan) or given credit (in the case of a purchase agreement) for such prepaid charges in an amount not to exceed the charges authorized under the Uniform Grain Storage Agreement.

PURCHASE AGREEMENT SETTLEMENT RATES - If farm-stored, rates as shown on map. If warehouse-stored, same rates as shown on map with applicable deductions as shown under warehouse loans, unless*

Table 1: Number of bushels of 12 percent moisture content grain sorghum remaining after drying from various initial moisture levels ^{1/}

Initial Moisture Content of Grain	Bushels of 12 percent grain remaining after starting with: ^{2/}				
	1000 bu. of wet grain	2000 bu. of wet grain	3000 bu. of wet grain	4000 bu. of wet grain	5000 bu. of wet grain
(Percent)	(No)	(No)	(No)	(No)	(No)
28	818	1636	2454	3272	4090
26	841	1682	2523	3364	4205
24	864	1728	2592	3456	4320
22	886	1772	2658	3544	4430
20	909	1818	2727	3636	4545
18	932	1864	2796	3728	4660
16	955	1910	2865	3820	4775
14	977	1954	2931	3908	4885

^{1/} Assuming 56 pounds to a bushel of 12 percent grain.

^{2/} Formula to find the number of bushels of 12 percent grain sorghum that remains after drying from a higher moisture content:

$$\frac{\text{No. of wet bushels} \times (100 \text{ minus percent of moisture in wet grain})}{88}$$

Example: Bushels of 12 percent grain = $\frac{2000 \times (100 - 20)}{88} = \frac{16000}{88} = 1818$

The dry matter content of 12 percent grain sorghum is 88 percent.

It will pay to dry and store grain sorghum if the support price is enough higher than the market price to cover the costs of drying, shrinkage, storage and taxes. Field losses from shattering, storms, and birds are also reduced by earlier harvesting and drying. For example, if the harvest-time market price at the farm is \$1.20 a cwt. for No. 2 "dry" grain sorghum, 18-percent grain would bring 95 cents a cwt. after a 5-cent-a-point moisture discount. A 2000-bushel crop of 18-percent grain sorghum would be worth \$1064 under these conditions. By drying this crop to not over 13 percent moisture, the shrinkage would be 136 bushels. The remaining 1864 bushels, or 1043 cwt., would be worth \$1931 at a loan rate of \$1.85 a cwt., or \$867 more than if sold at harvest time. Part of this difference will have to be used to cover the additional costs of drying, storing, taxes, etc., but net income will be higher under such conditions than by selling at harvest time.

Farmers who cannot dry and store because they lack storage or drying facilities or both should not be in too great a hurry to harvest their grain sorghum. Moisture content can be reduced by allowing the crop to mature in the field and by letting it freeze to stop plant growth. This involves the risk of higher field losses which should be considered in deciding whether to cut earlier and dry to a safe level.

Costs of Drying

The farmer who decide to dry and store his grain sorghum on the farm has several possibilities for drying. He can buy motors and fans, equip his bins with

ducts and dry with unheated air. A second alternative is to buy a heated-air batch dryer to dry his own grain and possibly some additional grain on a custom basis. The third possibility is to have his grain dried on a custom basis rather than buying and installing drying equipment in his bins.

If he chooses to buy equipment to do his own drying, the cost per bushel or per hundredweight will vary with the size and types of equipment, the amount of grain dried and the initial moisture content of the grain. In general, the cost per bushel or cwt. declines as the amount of grain dried increases up to the maximum capacity of the equipment; and the cost per unit rises as the original moisture content increases. Farmers should try to select the size and type of equipment that will meet their long-time drying needs. Cost items to be included in figuring total costs and costs per unit are: depreciation, repairs, interest on investment, taxes, insurance, and power and fuel.

Estimated costs per bushel for drying grain sorghum of different moisture content with unheated air using common sizes of equipment are shown in Table 2. Similar costs using heated-air driers are shown in Table 3.

Charges for Custom Drying

Custom drying of grain sorghum has not been carried on sufficiently long or widespread in Nebraska for standard charges to become established. Some commercial elevators have drying facilities but these may not always be located where needed or have the capacity to meet the expected demand this fall. Our large grain sorghum crop and the necessity of drying to less than 13 percent moisture for safe storage will mean opportunities for those who own heated-air driers to do custom drying.

Questions commonly being asked by those considering custom drying are: "Should I charge on a dry or wet basis?"; "How much should I charge per bushel or per cwt.?" and "How should the charge vary with moisture content of the grain?"

As is the case with other custom operations, the rates will tend to be set by those who more or less make a business of drying grain for others. How much they will charge will depend on many factors. Perhaps the most important factor is the average volume of grain which operators of custom outfits expect to be able to handle over a period of years. Because of the variation in weather, there will be more need for artificial drying in some years than in others. Therefore, the prospective custom operator needs to think not only in terms of how much sorghum or corn he may have an opportunity to handle this fall, but how much grain of all kinds he might have an opportunity to dry year-in and year-out during the life of the dryer. Another consideration is the variation in cost of drying with different levels of moisture content.

The cost figures shown in Table 3 can be used as a guide or starting point for establishing custom charges. In addition to recovering actual costs, the custom operator is justified in expecting a reasonable profit for his managerial efforts and risks; otherwise he has no incentive for undertaking such an operation. In figuring costs and custom charges, the opportunities for using drying equipment for wheat, corn and other grains and the year-to-year variations in need for artificial drying should be considered. With these points in mind, suggested custom rates for drying grain sorghum with different moisture contents are shown in Table 4.

Table 2: Estimated costs of drying grain sorghum
at 6 foot depth with unheated air

Volume to be dried	Cost in cents per bushel with initial moisture content of:							
	14%	16%	18%	20%	22%	24%	26%	28%
Bushels	1½ H. P. Motor, 16" Fan							
200	17.1	17.5	17.9	18.3	18.7	19.1	19.5	20.1
400	8.7	9.1	9.5	9.9	10.3	10.7	11.2	11.7
600	5.9	6.3	6.7	7.1	7.5	7.9	8.4	8.9
800	4.5	4.9	5.3	5.7	6.1	6.5	6.9	7.5
Bushels	3 H. P. Motor, 18" Fan							
800	7.0	7.4	7.8	8.2	8.6	9.0	9.5	10.0
1000	5.7	6.0	6.4	6.8	7.2	7.7	8.2	8.7
1200	4.8	5.2	5.5	5.9	6.3	6.8	7.3	7.8
1400	4.2	4.5	4.9	5.3	5.7	6.2	6.6	7.1
Bushels	5 H. P. Motor, 24" Fan							
1400	6.3	6.7	7.1	7.5	7.9	8.3	8.8	9.3
1800	5.0	5.4	5.8	6.1	6.6	7.0	7.5	8.0
2200	4.2	4.5	4.9	5.3	5.7	6.1	6.6	7.1
2600	3.6	3.9	4.3	4.7	5.1	5.6	6.0	6.5
3000	3.1	3.5	3.9	4.3	4.7	5.1	5.6	6.1
Bushels	10 H. P. Motor, 42" Fan							
3000	5.3	5.6	6.0	6.4	6.8	7.3	7.8	8.2
3400	4.7	5.1	5.4	5.8	6.3	6.7	7.2	7.7
3800	4.2	4.6	5.0	5.4	5.8	6.2	6.7	7.2
4200	3.9	4.2	4.6	5.0	5.4	5.9	6.3	6.8
4600	3.6	3.9	4.3	4.7	5.1	5.6	6.0	6.5
5000	3.3	3.7	4.0	4.4	4.9	5.3	5.8	6.3
5400	3.1	3.4	3.8	4.2	4.6	5.1	5.6	6.0
5800	2.9	3.2	3.6	4.0	4.4	4.9	5.4	5.9

Table 3: Estimated costs of drying grain sorghum with heated air ^{1/}

Volume to be dried	Cost in cents per bushel with initial content of:							
	14%	16%	18%	20%	22%	24%	26%	28%
\$3600 Investment in Drying Equipment								
<u>Bushels</u>								
5000	9.9	10.6	11.2	11.9	12.6	13.4	14.2	15.2
7500	6.8	7.4	8.1	8.9	9.5	10.3	11.1	12.0
10000	5.2	5.9	6.5	7.2	7.9	8.7	9.5	10.4
12000	4.4	5.1	5.8	6.4	7.1	7.9	8.7	9.6
14000	3.9	4.6	5.2	5.9	6.6	7.4	8.2	9.1
16000	3.5	4.1	4.8	5.5	6.2	7.0	7.8	8.6
18000	3.2	3.8	4.5	5.2	5.9	6.7	7.5	8.3
20000	3.0	3.6	4.2	4.9	5.7	6.4	7.2	8.1
24000	2.6	3.2	3.9	4.5	5.1	6.0	6.8	7.7
\$4600 Investment in Drying Equipment								
<u>Bushels</u>								
5000	12.5	13.2	13.8	14.5	15.2	16.0	16.8	17.8
7500	8.5	9.2	9.8	10.5	11.2	12.0	12.8	13.7
10000	6.5	7.2	7.8	8.5	9.2	10.0	10.8	11.7
12000	5.5	6.2	6.9	7.5	8.2	9.0	9.8	10.7
14000	4.8	5.5	6.1	6.8	7.5	8.3	9.1	10.0
16000	4.3	4.9	5.6	6.3	7.0	7.8	8.6	9.4
18000	3.9	4.5	5.2	5.9	6.6	7.4	8.2	9.0
20000	3.6	4.2	4.8	5.5	6.3	7.0	7.8	8.7
24000	3.1	3.7	4.4	5.0	5.6	6.5	7.3	8.2

^{1/} Assuming 1.6 million BTU output in each case (1-4 million potential), using L. P. fuel at 11 cents per gallon electricity at 2¢ per kilowatt hour, and 65° weather with 50% humidity.

Table 4: Suggested custom rates for drying grain sorghum to 12 percent moisture with heated air

Initial moisture content	Rate to charge on a dry basis:	
	Per bushel	Per hundredweight
16 percent or less	8 cents	14.3 cents
Over 16 percent	8 cents plus ½ cent per bushel for each one percent moisture over 16 percent	14.3 cents plus 0.9 cents for each one percent moisture over 16 percent

Storage Costs

There is no one cost per bushel of storing grain that applies to all farms. The initial investment for construction of storage facilities may vary from as low as 25 cents a bushel to over a dollar. In addition to the usual charges for depreciation, repairs, insurance, interest and taxes, costs are also involved in preventing losses from waste in handling, spoilage, insects, and birds, rats and mice.

Where a farmer already has storage facilities available for his 1957 crop, the additional costs, those that he would not otherwise incur, would include insurance and taxes on the stored grain and the risk of spoilage. There would be no interest charge on the investment in the grain if a loan was taken on it because he would have his money for other uses. An interest charge should be included if the grain is stored for feed, for sale on the market later, or under a purchase agreement. For example, these additional costs on 1000 bushels of grain sorghum stored for 6 months would average about \$25 for taxes, \$3 for insurance, and \$12 for non-insurable risks and losses, or about 4 cents a bushel. Interest would add about \$20 more or 2 cents a bushel unless the grain was under loan.

The farmer who stores his grain sorghum on his farm according to U.S.D.A. requirements can get a higher loan rate than if he put it in commercial storage (see notes at bottom of the map). The higher on-farm loan rate thus helps to defray the costs of farm storage. For example, a deduction of 12 cents per cwt. or 6.7 cents a bushel would be made on grain placed in a commercial warehouse between November 2 and November 13, 1957. This would more than cover the additional costs of on-farm storage and would cover all costs for some structures.

The farmer who lacks sufficient on-farm storage for his grain sorghum is in a tight situation. Unless he can find commercial space, his only choices are to sell at harvest or to provide additional storage. The additional income which would result from drying, storing and taking a loan on the '57 crop will go a long way toward paying for storage facilities in just one year. Improper storage and spoilage could result in no income or at least a reduction below returns from harvest-time sale.

The annual building costs of farm grain storage can be roughly estimated at 8-10 percent of the original investment in the structure. On a 1500-bushel bin costing \$600, the storage building charge would be about \$60 or 4 cents a bushel. The additional grain storage costs for a year would be 5-6 cents a bushel. The total cost of storing grain under loan for a year would be 9-10 cents a bushel for this type of structure. If stored for feed or for sale, an interest charge on the average investment in the grain should be added according to the length of time the grain is stored. At a value of 60 cents a bushel, the interest charge would be about 2 cents for 6 months or 4 cents for a full year.

Other factors to consider in deciding whether to build more on-farm storage include:

- (1) The longer-run needs for more storage to meet recurring emergencies, or to provide more flexibility in grain marketing and livestock raising or feeding;
- (2) The requirements of U.S.D.A. as to storage facilities when a price support loan is obtained;

- (3) Current availability of the provision for fast depreciation of storage structures for income tax structures;
- (4) Favorable credit terms for building storage and installing drying facilities when loans for this purpose are arranged through A.S.C.;
- (5) Storage fees earned when grain is "resealed".

Some farmers will find that their storage needs call only for more space for grain. Others may decide they prefer multiple-use buildings that can be used for grain storage as needed but may be converted to machinery or livestock housing or hay storage when not needed for grain.

For More Information

On price supports, U.S.D.A. storage requirements, and farm storage facility and equipment and loans, visit your County ASC Office.

On building plans, harvesting, storing, drying and feeding grain sorghum, see your County Agricultural Agent.

The following publications can be obtained from your county agent, or from The Agricultural Information Dept., University of Nebraska, Lincoln 3:

SB439, Grain Sorghums as Feeds for Beef Cattle and Hogs, University of Nebraska.

CC158, Harvesting, Storing and Feeding the 1957 Sorghum Crop, University of Nebraska.

U.S.D.A Leaflet 331, Drying Shelled Corn and Small Grain with Heated Air.

U.S.D.A. Leaflet 332, Drying Shelled Corn and Small Grain with Unheated Air.

U.S.D.A. Farmers Bulletin 2009, Storage of Small Grains and Shelled Corn on the Farm.

U.S.D.A. Farmers Bulletin 2071, You Can Store Grain Safely on the Farm.