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CALCULATING GRAIN DRYING COST

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Cost categories involved when drying grain are energy costs, which vary with the amount of moisture removed; capital costs, which are fixed once a dryer is purchased, labor costs and handling costs. Although individual situations differ and should be analyzed accordingly, estimates can be made. Typical cost estimates are made in this circular to help evaluate grain drying decisions.

The energy cost associated with drying wheat and corn will be about 1.5 cents per bushel per point of moisture removed. The expected energy cost for sunflower is 2.5 cents per hundredweight per point of moisture removed. This is based on 70 cents per gallon propane using a high temperature dryer. Capital costs will be about 6 cents per bushel, labor cost will be about 2 cents per bushel.

ESTIMATED ENERGY COSTS

Energy consumption depends on the type of dryer. Generally, the faster the drying speed, the greater the energy consumption. An estimate of the amount of energy required to remove a pound of water using different dryer types is listed in Table 1.

Table 1. Estimated Drying Energy Requirement.

Dryer Type	BTU's/lb. of Water Removed
Natural Air	1000-1200
Low Temperature	1200-1500
Batch-In-Bin	1500-2000
High Temperature	
Air Recirculating	1800-2200
Without air recirculating	2000-3000

3413 BTU per KWH

For natural air drying, approximately 50 percent of the drying energy is provided by electricity for the fan and 50 percent comes from the air. When drying low temperature, about 50 percent of the energy is provided by electricity for the fan and 50 percent by electricity or propane for the heater. About 98 percent of the energy for high temperature drying is provided by propane for the heater and about 2 percent by electricity for the fan. This needs to be considered when selecting the energy price in Tables 2, 4 and 5. Propane at 60 cents per gallon used for heat is approximately equivalent to electricity at 5.14 cents per kilowatt hour for motors and electricity at 2.57 cents per kilowatt hour for heating.

Table 2. Estimated Drying Energy Cost Per Pound of Water Removed.

	Propane Price (¢/gallon)								
	50	55	60	65	70	75	80	85	90
	Fan Electric Rate (¢/KWH)								
	4.29	4.71	5.14	5.57	6.00	6.43	6.86	7.29	7.71
	Electric Heat Rate (¢/KWH)								
	2.14	2.36	2.57	2.79	3.00	3.21	3.43	3.64	3.86
Drying Energy[1] Requirement (BTU's/lb. water)	Estimated Energy Cost (Cents/Pound of Water Removed)[2]								
1200	0.750	0.825	0.900	0.975	1.050	1.125	1.200	1.275	1.350
1500	0.938	1.031	1.125	1.219	1.313	1.406	1.500	1.594	1.688
2000	1.250	1.375	1.500	1.625	1.750	1.875	2.000	2.125	2.250
2500	1.563	1.719	1.875	2.031	2.188	2.344	2.500	2.656	2.813
3000	1.875	2.063	2.250	2.438	2.625	2.813	3.000	3.188	3.375

[1]Refer to Table 1.
[2]A propane price of 70¢/gal is approximately equivalent to electricity at 3¢/KWH for a heater and electricity at 6¢/KWH for a fan.

The estimated drying energy cost per pound of water removed for some drying energy requirements and energy costs are shown in Table 2.

The pounds of water removed when drying depends on the weight of the crop being dried and the reduction in moisture content. About 0.72 pounds of water is removed per bushel per point when drying wheat and corn and about 1.19 pounds per hundredweight per point when drying sunflower. The actual values can be calculated from Table 3. Drying oil type sunflower from 16 percent to 10 percent will remove 107.15 − 100.00 = 7.15 pounds

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of water per hundredweight. This is 7.15 ÷ 6 = 1.19 pounds per hundredweight per point of moisture removed.

Based on 0.72 pounds of water per bushel per point for wheat and corn, and 1.19 pounds of water per hundredweight-point for sunflower, the energy cost of drying is shown in Tables 4 and 5. For example, the estimated drying energy cost for drying wheat using a natural air type dryer and a 6 cents per kilowatt hour electric rate for the fan is 0.76 cents per bushel-point. The energy cost drying the wheat from 17 percent to 13 percent moisture content then is 0.76 cents per bushel-point × 4 percent = 3.04 cents per bushel. The estimated energy cost using a low temperature dryer and a 6 cents per kilowatt hour electric rate for the fan and a 3.21 cents per kilowatt hour electric rate for the heater would be (0.95 + 1.01) ÷ 2 = 0.98 cents per bushel-point. The estimated energy cost for drying the wheat from 17 percent to 13 percent is 0.98 cents per bushel-point × 4 = 3.92 cents per bushel. The estimated energy cost using a high temperature dryer without air recirculating using 2500 BTU's/lb and a propane price of 70 cents per gallon is 1.58 cents per bushel-point. The estimated cost for drying wheat four percentage points is 1.58 cents per bushel-point × 4 = 6.32 cents per bushel.

ACTUAL ENERGY COST

Actual energy costs are calculated by measuring the amount of moisture removed and the amount of

Table 3. Wet Weights to Equal a Bushel at Standard Moisture Contents.

Moisture Content	Wheat	Sunflower CWT	Corn	Barley	Oats	Rye	Beans
5.0	54.63	94.73	49.81	43.20	30.78	50.69	54.95
5.5	54.92	95.24	50.07	43.43	30.94	50.96	55.24
6.0	55.21	95.74	50.34	43.66	31.11	51.23	55.53
6.5	55.51	96.26	50.61	43.89	31.27	51.51	55.83
7.0	55.81	96.78	50.88	44.13	31.44	51.79	56.13
7.5	56.11	97.30	51.16	44.37	31.61	52.07	56.43
8.0	56.42	97.83	51.44	44.61	31.78	52.35	56.74
8.5	56.72	98.36	51.72	44.85	31.96	52.63	57.05
9.0	57.03	98.90	52.00	45.10	32.13	52.92	57.36
9.5	57.35	99.45	52.29	45.35	32.31	53.22	57.68
10.0	57.67	100.00	52.58	45.60	32.49	53.51	58.00
10.5	57.99	100.56	52.87	45.85	32.67	53.81	58.32
11.0	58.31	101.12	53.17	46.11	32.85	54.11	58.65
11.5	58.64	101.69	53.47	46.37	33.04	54.42	58.98
12.0	58.97	102.28	53.77	46.64	33.23	54.73	59.32
12.5	59.31	102.86	54.08	46.90	33.42	55.04	59.65
13.0	59.65	103.46	54.39	47.17	33.61	55.36	60.00
13.5	60.00	104.05	54.71	47.45	33.80	55.68	60.35
14.0	60.35	104.66	55.02	47.72	34.00	56.00	60.70
14.5	60.70	105.26	55.35	48.00	34.20	56.33	61.06
15.0	61.06	105.89	55.67	48.28	34.40	56.66	61.41
15.5	61.43	106.52	56.00	48.57	34.61	57.00	61.78
16.0	61.79	107.15	56.33	48.86	34.81	57.34	62.14
16.5	62.16	107.79	56.67	49.15	35.02	57.68	62.52
17.0	62.53	108.44	57.01	49.45	35.23	58.03	62.89
17.5	62.91	109.10	57.36	49.75	35.44	58.38	63.28
18.0	63.30	109.76	57.71	50.05	35.66	58.74	63.66
18.5	63.69	110.44	58.06	50.36	35.88	59.10	64.05
19.0	64.08	111.11	58.42	50.67	36.10	59.46	64.45
19.5	64.47	111.81	58.78	50.98	36.32	59.83	64.85
20.0	64.88	112.51	59.15	51.30	36.55	60.20	65.25
21.0	65.70	113.93	59.90	51.95	37.01	60.96	66.08
22.0	66.54	115.39	60.67	52.62	37.49	61.75	66.93
23.0	67.41	116.89	61.45	53.30	37.98	62.55	67.80
24.0	68.29	118.43	62.26	54.01	38.47	63.37	68.69
25.0	69.20	120.00	63.09	54.73	38.99	64.22	69.61
26.0	70.14	121.62	63.95	55.47	39.52	65.09	70.55
27.0	71.10	123.29	64.82	56.22	40.06	65.98	71.51
28.0	72.10	125.00	65.72	57.00	40.61	66.89	72.51
29.0	73.10	126.77	66.65	57.80	41.19	67.84	73.53
30.0	74.15	128.58	67.60	58.63	41.77	68.80	74.58

energy used. Weighing the wet grain and the dried grain would accurately determine the pounds of water removed. For example, 500 bushels of 23 percent moisture corn would weigh about 30,723 pounds and 500 bushels of 15 percent moisture corn would weigh about 27,835 pounds, so 2890 pounds of water would be removed during drying. If the grain is not weighed, both the number of bushels dried and the change in moisture content are required to determine the amount of moisture removed in bushel-points. For example, the amount of moisture removed drying 500 bushels of corn from 23 to 15 percent moisture content is $500 \times (23 - 15) = 4000$ bushel-points of moisture removed.

The amount of all forms of energy used for drying must be measured. For example, the number of gallons of propane and the number of kilowatt-hours of electricity. One gallon of propane has an effective heat content for grain drying of about 80,000 BTUs

Table 4. Estimated Drying Energy Cost for Wheat and Corn.

		Propane Price (¢/gallon)								
		50	55	60	65	70	75	80	85	90
		Fan Electric Rate (¢/KWH)								
		4.29	4.71	5.14	5.57	6.00	6.43	6.86	7.29	7.71
		Electric Heat Rate (¢/KWH)								
		2.14	2.36	2.57	2.79	3.00	3.21	3.43	3.64	3.86
Dryer Type	**Drying Energy Requirement BTU's/lb. water**	**Estimated Energy Cost (Cents/Bushel-Point)**								
Natural Air	1200	0.54	0.59	0.65	0.70	0.76	0.81	0.86	0.92	0.97
Low Temperature	1500	0.68	0.74	0.81	0.88	0.95	1.01	1.08	1.15	1.22
Batch-in-Bin High Temperature w/Air Recirculating	2000	0.90	0.99	1.08	1.17	1.26	1.35	1.44	1.53	1.62
High Temperature w/o Air Recirculating	2500	1.13	1.24	1.35	1.46	1.58	1.69	1.80	1.91	2.03
	3000	1.35	1.49	1.62	1.76	1.89	2.03	2.16	2.30	2.43

0.72 pounds of water per bushel per point of moisture 17% to 13% wheat 23% to 15% corn

Table 5. Estimated Drying Energy Cost for Sunflower.

		Propane Price (¢/gallon)								
		50	55	60	65	70	75	80	85	90
		Fan Electric Rate (¢/KWH)								
		4.29	4.71	5.14	5.57	6.00	6.43	6.86	7.29	7.71
		Electric Heat Rate (¢/KWH)								
		2.14	2.36	2.57	2.79	3.00	3.21	3.43	3.64	3.86
Dryer Type	**Drying Energy Requirement BTU's/lb. water**	**Estimated Energy Cost (Cents/cwt.-Point)**								
Natural Air	1200	0.89	0.98	1.07	1.16	1.25	1.34	1.43	1.52	1.61
Low Temperature	1500	1.17	1.23	1.34	1.45	1.56	1.67	1.79	1.90	2.01
Batch-in-Bin High Temperature w/Air Recirculating	2000	1.49	1.64	1.79	1.93	2.08	2.23	2.38	2.53	2.68
High Temperature w/o Air Recirculating	2500	1.86	2.05	2.23	2.42	2.60	2.79	2.98	3.16	3.35
	3000	2.23	2.45	2.68	2.90	3.12	3.35	3.57	3.79	4.02

1.19 pounds of water per CWT per point of moisture 16% to 10%

per gallon. One kilowatt-hour of electricity is equivalent to 3413 BTUs. To dry the 500 bushels of corn mentioned previously might take 88.5 gallons of propane and 42.3 KWH of electricity. The energy use would be 88.5 × 80,000 = 7,080,000 BTU from the propane and 42.3 KWH × 3413 = 144,370 BTU from the electricity totaling 7,224,370 BTUs. The energy required to remove a pound of water during drying then is 7,224,370 BTU ÷ 2890 lbs. = 2500 BTU per pound. If the price of propane is 70 cents per gallon, then the propane drying cost is $0.70 × 88.5 = $61.95. At an electric price of 6 cents per KWH, the cost for electricity is $.06 × 42.3 KWH = $2.54. The total drying energy cost then is $61.95 + $2.54 = $64.49, which is 1.61 cents per bushel per point of moisture removed; (64.49 ÷ 4000 bu-pts.).

LABOR COST

Labor should be included as a cost when determining a custom rate. The total hourly labor rate should be used if the person is constantly at the dryer and a fraction of the hourly labor rate if the person only attends the dryer part-time. The labor cost per unit dried is the hourly rate divided by the drying rate.

$$\text{Per unit labor cost} = \frac{\text{Hourly Labor Rate}}{\text{Hourly Drying Rate}}$$

$$\text{Per unit labor cost} = \frac{\$5.00/\text{hr.}}{250\ \text{bu/hr.}} = \$0.02 \text{ per bushel}$$

HANDLING COSTS

More grain handling equipment is likely required when drying grain than if the grain is not mechanically dried. There is both a capital cost for the equipment as well as an energy cost when using the equipment. The capital cost is about 16 percent of the purchase price. The capital cost can be divided by the number of bushels handled to give a per unit fixed cost. An estimated capital cost might be 1 to 2 cents per bushel. The handling energy cost will vary depending on the type of handling equipment used. The per unit cost is calculated by dividing the total energy cost for grain handling by the number of bushels moved. The energy cost is insignificant on a per bushel basis so the total handling cost can be estimated as about 1 to 2 cents per bushel dried.

ESTIMATED FIXED AND CAPITAL COSTS

The capital cost (annual ownership cost) depends on the price of the dryer or drying system. Annual ownership cost can be estimated at about 16 percent of the purchase price. This includes a depreciation rate of 10 percent, 8 percent interest on average investment, 0.5 percent for insurance, and 3 percent for repairs. For a $15,000 dryer the annual ownership cost would then be $2,400. The capital cost per bushel depends on the amount the dryer is used. Table 6 shows the capital cost per bushel for a $15,000 dryer for various quantities of crop dried per year.

Table 6. Example Dryer Capital Cost per Bushel.

Bushels/Yr.	Hours Drying	¢/Bu.
20,000	80	12.0
25,000	100	9.6
30,000	120	8.0
40,000	160	6.0
50,000	200	4.8
60,000	240	4.0
70,000	280	3.4

Drying time based on 250 bushels per hour.
Annual ownership cost of $2,400.
Purchase price $15,000.

The capital cost is about 6 cents per bushel if the $15,000 dryer is used to dry 40,000 bushels. Since the weight of oil type sunflower is 32 pounds per bushel, it takes 3.125 bushels to make 100 pounds. The capital cost per CWT than is 3.125 times that per bushel or $0.06 × 3.125 = 18.75 cents/CWT based on 40,000 × 0.32 CWT/bu. = 12,800 CWT/yr.

ACTUAL CAPITAL COST

Determine the actual capital or ownership cost by examining depreciation, interest on average investment, insurance and possibly repairs (unless repairs are recorded separately).

Annual Depreciation

Annual depreciation is determined by multiplying the depreciation rate times (purchase price − salvage value).

The depreciation rate can be calculated using the straight line method:

$$\text{Depreciation Rate} (\%) = \frac{100}{\text{Years of Life}}$$

$$\text{Depreciation Rate} (\%) = \frac{100}{10} = 10\%$$

The annual depreciation for a dryer with a purchase price of $15,000 and a salvage value after 10 years of $2,000 with a depreciation rate of 10% is:

Annual Depreciation = 10% × (15,000 − 2,000)

Annual Depreciation = $1,300

Interest on Average Investment

The real interest rate is used for interest calculations. The real interest rate is the interest rate minus inflation rate. With an interest rate of 12 percent and an inflation rate of 4 percent, the real interest rate is 8 percent (12% – 4%). The interest is calculated on the average investment.

The average investment is the average of the purchase price and the salvage value. For a dryer with a $15,000 purchase price and a $2,000 salvage value after 10 years, the average investment is $8,500 [(15,000 + 2,000) ÷ 2]. The real interest on average investment then is $680 ($8,500 × 8%).

ACTUAL FIXED COST

Insurance can be calculated as 0.5 percent of the average investment unless the actual premium amount is known.

Repairs can be calculated as a fixed cost at 3 percent of purchase price or can be included as a variable cost if dryer repair costs have been recorded separately so they can be related to bushels dried. Actual repair costs depend on how much the dryer is used annually and the quality of care it receives. Belts, bearings, pulleys, shafts and controls are typical repair items.

The annual capital and fixed cost for the $15,000 dryer then is:

Depreciation	
10% × ($15,000 – $2,000) =	$1,300
Interest on average investment	
8% × $\frac{(\$15,000 + \$2,000)}{2}$ =	$ 680
Insurance	
0.5% × $\frac{(\$15,000 + \$2,000)}{2}$ =	$ 42.50
Repairs	
3.0% × $15,000 =	$ 450
TOTAL FIXED AND CAPITAL COST	$2,472.50

In this example, annual fixed and capital costs as a percent of purchase price are 16.5%

$$\frac{\text{Annual Fixed and Capital Cost}}{\text{Purchase Price}} = \frac{\$2{,}742.50 \times 100}{\$15{,}000} = 16.5\%$$

To determine the fixed and capital cost per bushel or hundredweight, divide the total fixed and capital cost by the number of units dried annually.

$$\text{Per unit fixed cost} = \frac{\text{Total Fixed Cost}}{\text{Annual Number of Units}}$$

$$\text{Per unit fixed cost} = \frac{\$2{,}472.50}{40{,}000 \text{ bu.}} = \$0.062 \text{ per bushel}$$

Per hundredweight = 0.062 × 3.125 = $0.194 per CWT of sunflower

TOTAL DRYING COST

The total drying cost is the sum of the energy cost, labor cost, handling cost, capital and fixed cost, and repair cost. For example, the total drying cost per hundredweight to dry sunflower from 15 to 10 percent moisture content in a high temperature dryer is:

Energy Requirement = 2500 BTUs/lb. water (from Table 1)
Propane Price = 70¢/gallon

Energy Cost = 2.60¢/CWT per Pts. × 5 = 13.0¢/CWT (from Table 5)

Labor Cost = 0.02¢/bu. × 3.125 = 6.25¢/CWT

Handling Cost = 1¢ × 3.125 = 3.13¢/CWT

Capital and Repair Cost = 6.0¢ × 3.125 = 18.75¢/CWT (from Table 6, Based on 40,000 bushels or 12,800 CWT dried per year)

Total Drying Cost = 13.0¢ + 18.75¢ + 6.25¢ + 3.13¢ = 41.13¢/CWT

The best way to determine drying cost is to keep accurate records and do the calculations on the following worksheet. The energy efficiency of the dryer can be determined by dividing the energy used by the pounds of water removed.

DRY OR MARKET WET

The decision to market wet grain or dry grain depends on the moisture shrink, handling loss, and cost of drying compared to the moisture discount. The moisture discount is the amount that grain price is reduced because the grain contains excess moisture. The moisture discount needs to include moisture shrink, handling loss, drying cost and an indication of the risk of the grain spoiling before being dried.

Moisture shrink is calculated using the following equation:

$$\text{Moisture Shrink (\%)} = \frac{Mo - Mf}{100 - Mf} \times 100$$

Mo = Original or initial moisture content, (%)
Mf = Final moisture content, (%)

The moisture shrink when drying sunflower from 15 percent to 10 percent moisture content is:

$$\text{Moisture Shrink (\%)} = \frac{15 - 10}{100 - 10} \times 100 = 5.56\%$$

Handling loss will vary for each facility so it should be determined for each facility, but a 0.50 percent loss for handling through a facility is common.

The drying cost and shrink must be calculated before a comparison can be made to the moisture discount. Compare, for example, a moisture discount of 2 percent for each 1 percent moisture removed, to the cost of drying before marketing 15 percent moisture content sunflower.

Moisture Discount:
15% − 10% = 5% moisture reduction
5% × 2% = 10% price reduction
10% × $10.00 per CWT = $1.00 per CWT at 15% m.c

Adjustment to 10% moisture content basis:
Price discount − (moisture shrink (%) × Price discount)
$1.00 − (5.56% × $1.00) = $0.94 per CWT at 10% m.c.

Drying Cost:		**Percent of Price**
Moisture Shrink (from previous example		5.56%
Handling Loss		0.50%
Capital and Fixed Cost (from previous example)	$0.1875/CWT	
Energy Cost (Table 5, 2500 BTU/lb Propane 70¢/gallon) 2.60¢ × 5 pts =	$0.130/CWT	
Handling Cost 1¢/bu × 3.125 =	0.031/CWT	
Labor $5.00/hr / 80 CWT/hr =	0.0625/CWT	
SUBTOTAL	$0.411/CWT	
$0.411/CWT / $10.00/CWT × 100 =		4.11%
TOTAL		10.17%

Cost = 10.17% × $10.00 = $1.017

Comparison: Moisture Discount $0.94
Drying Cost 1.02

In this example, there is no advantage to drying the sunflower before marketing. The moisture discount would be less than the total drying cost.

Another way to compare drying cost to moisture discount is to not consider the capital and fixed cost. This would be a rational comparison when the decision is whether or not to use an existing drying system. The drying cost then is:

		Percent of Price
Moisture Shrink		5.56%
Handling Loss		0.50%
Energy Cost	$.130/CWT	
Handling Cost	$.031/CWT	
Labor	$.0625/CWT	
Subtotal	$.2235/CWT	
$.2235/CWT / $10.00/CWT × 100 =		2.24
TOTAL		8.30%

Cost =
8.30% × $10.00/CWT = $0.83

Comparison: Moisture Discount = $0.94
Drying Cost = $0.83

Now there is an advantage for drying in comparison to marketing the sunflower wet for a moisture discount of 2 percent per percent of moisture above the market requirement. As the price of grain changes, the percentage that drying cost is of the price changes.

The following example shows the change in percentages for the previous drying cost example using a sunflower price of $6.00 per CWT.

	Percent of Price
Moisture Shrink	5.56%
Handling Loss	.50%
Capital, fixed, handling & labor 0.411/CWT × 100 / 6.00/CWT =	6.85%
TOTAL	12.91%

Cost = 12.91% × $6.00 = $0.77

The percent that drying cost is of the price changes from 7.99% to 12.91%. The drying cost, however, is reduced from $0.80 to $0.77 due to the moisture shrink affecting sunflower with a price of $6.00 vs. $10.00.

The moisture discount must be adjusted as the sunflower price changes to compare to the drying cost.

Moisture Discount for a 5% Moisture Reduction

Discount	
2:1	2% × 5% = 10% price reduction 10% × $6.00/CWT = $0.60 $.60 − (5.56% × .60) = $.58
2.5:1	2.5% × 5% = 12.5% 12.5% × $6.00/CWT = 0.75 $.75 − (5.56% × .75) = $0.71
3:1	3% × 5% = 15% 15% × $6.00/CWT = 0.90 $.90 − (5.56% × .90) = $0.88

For $6.00/CWT sunflower, a moisture discount of 2.5% for each percent moisture reduction would be slightly less than the drying cost. For $10.00/CWT sunflower, a moisture discount of 2% per point was just slightly less than the drying cost.

EXAMPLE DRYING COST WORKSHEET

Drying 500 bushels of corn from 23% to 15% moisture content

CAPITAL COST

Depreciation = rate × (purchase price − salvage value)

10% × ($15,000 − $2,000) — $1,300.00

Interest on average investment:

$$(\text{Current rate} - \text{inflation rate}) \times \frac{(\text{purchase price} + \text{salvage value})}{2}$$

$$(12\% - 4\%) \times \frac{(\$15{,}000 + \$2{,}000)}{2}$$ — 680.00

FIXED COST

Insurance: $$0.5\% \times \frac{(\text{purchase price} + \text{salvage value})}{2}$$

$$0.5\% \times \frac{(\$15{,}000 + \$2{,}000)}{2}$$ — 42.50

Repairs: 3% × purchase price

3% × $15,000 — 450.00

TOTAL FIXED AND CAPITAL COST — $2,472.50

$$\text{Fixed and Capital cost per unit} = \frac{\text{Total Capital and Fixed Cost}}{\text{Annual units dried}}$$

$$= \frac{\$2{,}472.50}{40{,}000\ \text{bu.}}$$ — $0.062/bu

VARIABLE COST

Energy Cost:

Fuel Cost 88.5 gallons × $0.70 = $61.95 (1)

Electricity Cost 42.3 KWH × $0.06 = 2.54 (2)

Total Energy Cost (1 + 2) $64.49

Energy cost per unit dried

$$\frac{\text{Total Energy Cost}}{\text{units dried}} \qquad \frac{\$64.49}{500} =$$ — $0.129/unit

Labor Cost:

$$\text{Per unit labor cost} = \frac{\text{Hourly Labor Rate}}{\text{Hourly Drying Rate}} \qquad \frac{\$5.00}{250} =$$ — $0.02

Handling Cost:

$$\frac{\text{Handling system purchase price} \times 16\%}{\text{Annual Units Dried}}$$

$$\frac{\$3400 \times 16\%}{40{,}000} = \$0.0136/\text{bu.}$$ — $0.01

TOTAL DRYING COST PER UNIT

Fixed and Capital Cost + Energy Cost + Labor Cost + Handling Cost

$0.062 + $0.129 + $0.02 + $0.01 = $0.22/bu.

DRYING COST WORKSHEET

CAPITAL COST

Depreciation = rate × (purchase price − salvage value) ________

Interest on average investment:
(Current rate − inflation rate) × $\frac{\text{(purchase price + salvage value)}}{2}$ ________

FIXED COST

Insurance: 0.5% × $\frac{\text{(purchase price + salvage value)}}{2}$ ________

Repairs: 3% × purchase price ________

TOTAL FIXED COST ________

Fixed cost per unit = $\frac{\text{Total Capital and Fixed Cost}}{\text{Annual units dried}}$ ________

VARIABLE COST

Energy Cost:

Fuel Cost ________(1)

Electricity Cost ________(2)

Total Energy Cost (1 + 2) ________

Energy cost per unit dried $\frac{\text{Total Energy Cost}}{\text{units dried}}$ ________

Labor Cost:

Per unit labor cost = $\frac{\text{Hourly Labor Rate}}{\text{Hourly Drying Rate}}$ ________

Handling Cost:

$\frac{\text{Handling system purchase price} \times 16\%}{\text{Annual Units Dried}}$ ________

TOTAL DRYING COST PER UNIT

Fixed and Capital Cost + Energy Cost + Labor Cost + Handling Cost ________

Helping You Put Knowledge To Work

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