

3-1-1979

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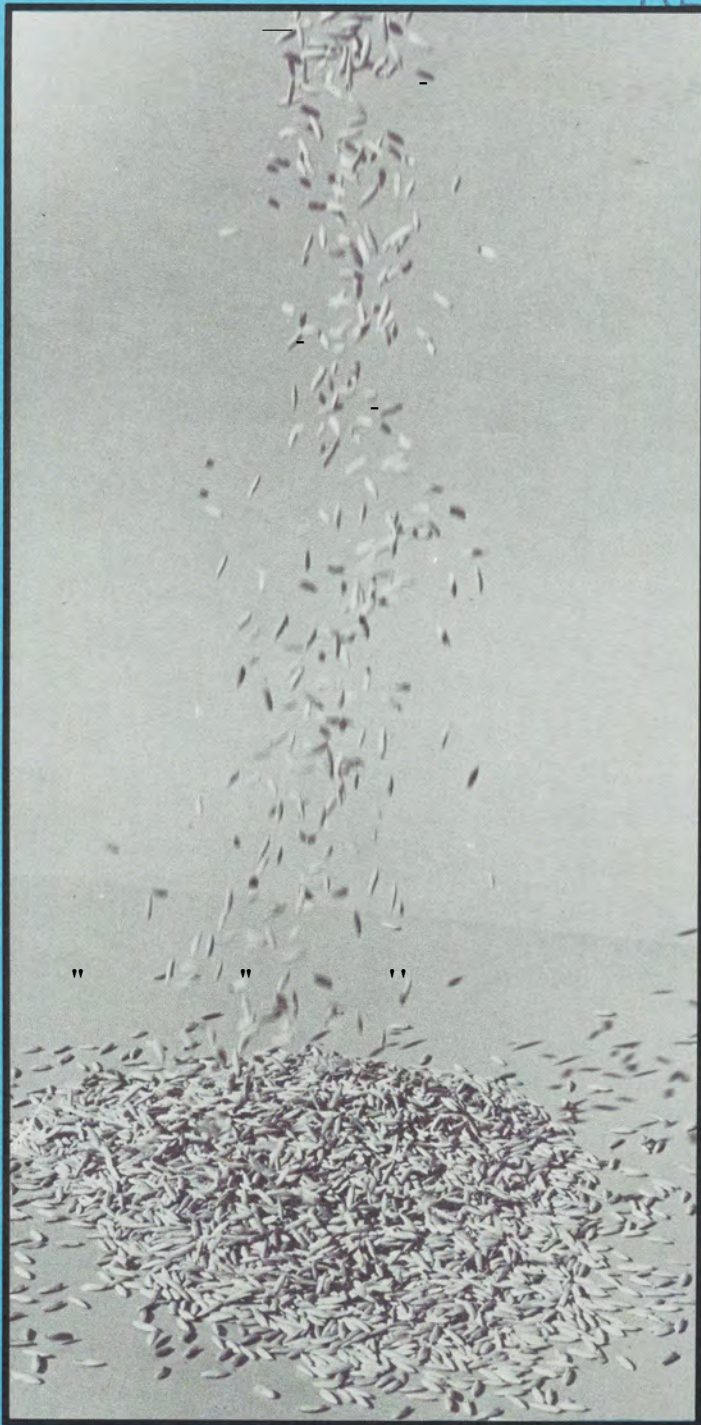
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By
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and
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NED, ESCS, USDA
in cooperation with



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Information Bulletin 8

**Costs of Commercial Rice
Drying and Storage Facilities
in Mississippi, 1978**

By

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March 1979

Costs of Commercial Rice Drying and Storage Facilities in Mississippi, 1978

Recent expansion of rice acreage and the potential for further expansion have created a need for additional rice drying and storage capacity in Mississippi. On-farm facilities are used for drying and storing most of the rice produced in the state, and the bulk of the crop likely will be dried and stored on

farms in the future. However, additional commercial capacity will be needed to accommodate the needs of the expanding rice milling industry.

Rice mills are operated year-round but usually have only enough storage capacity to supply the operation for two to three

weeks. Therefore, rough rice is procured from farmers and commercial facilities as needed. However, farmers must empty their storage bins to provide storage for each new crop, and enough commercial storage capacity is needed to supply rough rice to mills during the harvest period.

Objectives

The purpose of this study was to develop the cost data needed for evaluating the feasibility of investments in additional commer-

cial facilities for drying and storing rice. Specific objectives were to determine the capital requirements for facilities with upright concrete¹

storage tanks and headhouse, to develop average costs of operating the facilities and to evaluate economies of size.

Procedures

Appropriate costs indices were used to revise the cost data developed in a study made in 1973.² Costs were developed for facilities with storage capacities of 150,000, 300,000 and 600,000 cwt—referred to hereafter as small, medium and large, respectively.³

We used four annual turnover

rates for facilities of each size (i.e., total annual receipts of 45, 90, 135 and 180% of storage capacity) and used the annual receipts of facilities of each size at each turnover rate (Table 1) to calculate the costs per cwt of *receiving, drying and loadout*. We then estimated hundredweight months of

storage (i.e., summation of the quantities of rice in storage at the end of each month) and calculated *storage costs per cwt* by dividing hundredweight months of storage into total storage costs.

¹Specifying concrete facilities does not imply that facilities with metal storage tanks are not practical. Therefore, management must choose the type of construction material that is appropriate for each situation.

²For details of the methods and procedures used to develop building, equipment and operating costs see CED, ERS, USDA Marketing Research Report No. 1011, **Costs of Building and Operating Rice Drying and Storage Facilities in the South** by Shelby H. Holder, Joseph Ghetti and Zolon M. Looney.

³Capacity of the facility designated small in the earlier study was 100,000 cwt, a capacity of upright concrete design now considered too small to be feasible. Therefore, capacity of the small facility was increased to 150,000 cwt.

Investment Requirements

Estimates of the total investment required range from \$1.3 million for the small facility to \$3.9 million for the large facility (Table 2). Investment per cwt of capacity decreases with each increase in size of facility and is \$8.73, \$7.65 and \$6.54 for the small, medium and large facilities, respectively.

Investment in buildings accounts for more than one half of the

total capital requirement for facilities of each size and increases as a percentage of total investment with each increase in facility size. Storage tanks and head houses account for more than 80% of the building investment required for facilities of each size. The relatively large investment in pilings would be lower for facilities constructed on soils different from those specified in this study.

The largest investment requirements for equipment are for receiving and drying and for air pollution control systems. Pollution control systems now account for about 6 to 8% of the total investment required for facilities of each size but will comprise a higher percentage of total investment if the current trend toward more rigid pollution standards continues.

Annual Ownership Costs

Total costs of owning facilities for one year increase with each increase in facility size (Table 3). However, economies of size and

volume are significant and the annual ownership costs per cwt decrease from \$1.47 for the small facility at the 45% turnover rate to

28 cents for the large facility at the 180% turnover rate.

Table 1. Estimated annual receipts of rough rice and estimated hundredweight months of storage annually at small, medium and large commercial rice drying-storage facilities, for specified turnover rates, Mississippi, 1978.

Facility Size ¹	Turnover Rate ²			
	45%	90%	135%	180%
-----1,000 cwt-----				
Annual Receipts				
Small	67.5	135.0	202.5	270.0
Medium	135.0	270.0	405.0	540.0
Large	270.0	540.0	810.0	1,080.0
Hundredweight Months of Storage³				
Small	324.0	486.0	648.0	810.0
Medium	648.0	972.0	1,296.0	1,620.0
Large	1,296.0	1,944.0	2,592.0	3,240.0

¹Small, medium and large are 150,000, 300,000 and 600,000 cwt storage capacity, respectively.

²Turnover rate is the ratio of receipts to total storage capacity. It is a function of production and can vary significantly depending upon weather and acreage planted.

³Estimated quantities of rice on hand at the end of each month were summed to attain a measure of hundredweight months of storage. Receipt patterns vary by year, state and locality, but the variations are not great enough to affect total months of storage significantly.

Annual Operating Costs

The total capital required for operating facilities for one year increases with each increase in facility size and with each increase in the turnover rate specified for facilities of each size (Table 4). However, annual operating costs per cwt decrease from 69 cents for the small facility at the 45% turnover rate to 19 cents for the large facility at the 180% turnover rate.

Annual Ownership and Operating Costs

The total costs of owning and operating facilities for one year increase with each increase in facility size and with each increase in the turnover rate specified for facilities of each size (Table 5). The costs per cwt of owning and operating facilities for one year decrease from \$2.16 for the small

Table 2. Estimated installation costs of small, medium and large commercial rice drying-storing facilities, Mississippi, 1978.¹

Item	Facility Size ²		
	Small	Medium	Large
	-----dollars-----		
Buildings			
Storage tanks and head houses	592,292	1,066,193	1,799,000
Office and sample house	14,351	23,152	29,320
Miscellaneous			
Dump pit and shed	6,000	6,000	12,000
Shop	10,000	10,000	10,000
Piling	45,661	129,161	265,976
Contingency (5%)	33,696	62,244	106,704
Subtotal	702,000	1,296,750	2,223,000
Equipment			
Receiving	153,088	194,786	437,697
Drying	148,304	244,706	345,462
Storing	57,408	110,607	191,178
Shipping	62,192	95,925	125,778
Miscellaneous			
Air pollution control systems	82,524	169,337	316,958
Other	65,780	116,480	179,439
Contingency (5%)	28,704	46,984	80,496
Subtotal	598,000	978,825	1,677,000
Other			
Land	4,000	6,000	8,000
Roads and yard	4,925	13,790	27,580
Contingency (5%)	446	990	1,780
Subtotal	9,371	20,780	37,360
Total	1,309,371	2,296,355	3,923,360
Per cwt	8.73	7.65	6.54

¹Update of Table 2 of CED, ESCS, USDA Marketing Research Report No. 1011. Table was updated using current construction and equipment costs and relevant price indices.

²See Footnote 1, Table 1.

facility at the 45% turnover rate to 47 cents for the large facility at the 180% turnover rate. The cost per cwt of owning and operating facilities of each size at each turnover rate are itemized in Tables 6-17.

Cost reductions associated with increases in hundredweight

months of storage are substantial. For example, our estimate of 13.78 cents storage cost per cwt for the large facility at the 90% turnover rate (Table 15) is based on 1.944 million hundredweight months of storage (average of 3.6 months storage for the firms included in our survey). Increasing storage

time to 4 months (2.16 million hundredweight months) reduces storage cost per cwt to 12.4 cents. Further increases in hundredweight months of storage lead to still lower storage costs per cwt, but reductions are at a decreasing rate.

Table 3. Total and per cwt annual ownership costs of small, medium and large commercial rice drying-storage facilities, for specified turnover rates, Mississippi, 1978.

Facility Size ¹	Turnover Rate ²			
	45%	90%	135%	180%
-----dollars-----				
Total				
Small	143,982	143,982	143,982	143,982
Medium	256,863	256,863	256,863	256,863
Large	438,437	438,437	438,437	438,437
Per cwt				
Small	1.47	.76	.52	.39
Medium	1.26	.66	.45	.34
Large	1.03	.54	.37	.28

¹See Footnote 1, Table 1.

²See Footnote 2, Table 1.

Table 4. Total and per cwt annual operating costs of small, medium and large commercial rice drying-storage facilities, for specified turnover rates, Mississippi, 1978.

Facility Size ¹	Turnover Rate ²			
	45%	90%	135%	180%
-----dollars-----				
Total				
Small	71,042	89,800	110,371	133,731
Medium	99,613	127,370	152,750	169,992
Large	152,053	198,601	240,181	267,948
Per cwt				
Small	.69	.47	.41	.39
Medium	.55	.37	.30	.25
Large	.40	.28	.23	.19

¹See Footnote 1, Table 1.

²See Footnote 2, Table 1.

Table 5. Total and per cwt annual ownership and operating costs of small, medium and large commercial rice drying-storage facilities, for specified turnover rates, Mississippi, 1978.

Facility Size ¹	Turnover Rate ²			
	45%	90%	135%	180%
-----dollars-----				
Total				
Small	215,024	233,782	254,353	277,713
Medium	356,476	384,233	409,613	426,855
Large	590,490	637,038	678,618	706,385
Per cwt				
Small	2.16	1.23	.93	.78
Medium	1.81	1.03	.75	.59
Large	1.43	.82	.60	.47

¹See Footnote 1, Table 1.

²See Footnote 2, Table 1.

Derivation of Hundredweight Months of Storage

Our estimates of hundredweight months of storage are based on patterns of receipts and shipments revealed by data obtained by personal interviews and from published sources, with some adjustments based on our judgment.

Receipts by months were obtained from the Weekly Weather and Crop Bulletin published by ESCS, USDA. We spread the receipts reported for Mississippi, Arkansas, Louisiana and Texas over the four

harvest months as follows: first month, 5%; second month, 55%; third month, 35% and fourth month, 5%. Receipt patterns vary by year, state and locality, but the variations are not great enough to affect total months of storage significantly.

Shipments by months were based (1) on the assumption that rice would be shipped during the receiving season only when necessary to keep the quantity in storage at 90% of capacity and (2) on reported shipments from

commercial rice dryers in the months following the receiving season.

We used the established patterns of receipts and shipments to determine the quantity of rice in storage at the end of each month. The quantities of rice on hand at the end of each month were summed to attain a measure of hundredweight months of storage to use for calculating storage utilization rates for each turnover rate.

Extrapolating Cost Calculations for Higher or Lower Hundredweight Months of Storage

Managers who have reason to believe that our estimates of storage costs per cwt are not close enough to their situation can adjust them. For example, we used 1,296,000 hundredweight months of storage to

calculate average storage cost for the medium facility at a turnover ratio of 1.35 (Table 12). A manager who believes that 1,500,000 would be a closer approximation of hundredweight months of storage can

adjust our estimate by a factor of .864 (1,296,000 ÷ 1,500,000). In this example, the adjusted average cost would be 10.24 cents (11.85 cents X .864).

Table 6. Small facility, .45 turn-over ratio: Estimated annual average cost for receiving, drying, storing and loading out rough rice, 1978.¹

Cost Item	Receiving by Truck	Drying	Storing	Loading Out	Total Cost
-----cents per cwt-----					
Fixed Costs:					
Building depreciation	.69	5.78	4.00	.33	10.80
Equipment depreciation	23.21	33.41	3.42	15.53	75.57
Insurance—building and equipment	.45	1.03	.36	.29	2.13
Taxes—building and equipment	2.57	5.70	1.98	1.65	11.90
Licenses and bonds	.02	—*	.10	—*	.12
Interest on investment	9.99	22.11	7.66	6.45	46.21
Total Fixed Cost	36.93	68.03	17.52	24.25	146.73
Variable Costs:					
Direct labor	3.33	12.22	3.64	2.91	22.10
Administrative overhead	4.41	10.29	3.06	4.04	21.80
Electricity	.33	2.87	.30	.14	3.64
Dryer fuel	—*	4.11	—*	—*	4.11
Truck expense	—*	1.42	—*	—*	1.42
Building repairs	.02	.20	.18	.02	.42
Equipment repairs	1.45	2.67	1.06	1.03	6.21
Insurance on rice	—*	—*	.03	—*	.03
Taxes on rice	—*	—*	.01	—*	.01
Fumigation	—*	—*	.06	—*	.06
Other	1.30	4.18	1.08	1.10	7.66
Interest on working capital	.23	.68	.19	.17	1.27
Total Variable Cost	11.07	38.64	9.61	9.41	68.73
TOTAL COST	48.00	106.67	27.13	33.66	215.46

—* = No allocation of this cost item made to this function.

Sums of individual cost items may not total due to rounding.

¹Costs in this table were obtained by updating materials contained in *Costs of Building and Operating Rice Drying and Storage Facilities in the South*, Marketing Research Report No. 1011, ERS, USDA, by Shelby H. Holder, Jr., Joseph L. Ghatti, and Zolon M. Looney.

Table 7. Small facility, .90 turn-over ratio: Estimated annual average cost for receiving, drying, storing and loading out rough rice, 1978.¹

Cost Item	Receiving by Truck	Drying	Storing	Loading Out	Total Cost
-----cents per cwt-----					
Fixed Costs:					
Building depreciation	.34	2.89	2.66	.17	6.06
Equipment depreciation	11.61	16.70	2.28	7.77	38.36
Insurance—building and equipment	.22	.51	.24	.15	1.12
Taxes—building and equipment	1.28	2.86	1.32	.82	6.28
Licenses and bonds	.01	---	.07	---	.08
Interest on investment	4.99	11.06	5.11	3.23	24.39
Total Fixed Cost	18.45	34.02	11.68	12.14	76.29
Variable Costs:					
Direct labor	1.91	9.55	2.90	1.51	15.87
Administrative overhead	2.11	4.97	2.14	1.92	11.14
Electricity	.25	2.08	.29	.11	2.73
Dryer fuel	---	3.83	---	---	3.83
Truck expense	---	1.27	---	---	1.27
Building repairs	.02	.18	.18	.02	.40
Equipment repairs	1.34	2.45	.97	.96	5.72
Insurance on rice	---	---	.03	---	.03
Taxes on rice	---	---	.01	---	.01
Fumigation	---	---	.06	---	.06
Other	.75	2.60	.90	.59	4.84
Interest on working capital	.13	.40	.15	.10	.78
Total Variable Cost	6.51	27.33	7.63	5.21	46.68
TOTAL COST	24.96	61.35	19.31	17.35	122.97

---* = No allocation of this cost item made to this function.

Sums of individual cost items may not total due to rounding.

¹See Footnote to Table 6.

Table 8. Small facility, 1.35 turn-over ratio: Estimated annual average cost for receiving, drying, storing and loading out rough rice, 1978.¹

Cost Item	Receiving by Truck	Drying	Storing	Loading Out	Total Cost
-----cents per cwt-----					
Fixed Costs:					
Building depreciation	.23	1.93	2.00	.11	4.27
Equipment depreciation	7.73	11.13	1.71	5.17	25.74
Insurance---building and equipment	.15	.34	.18	.10	.77
Taxes---building and equipment	.86	1.90	.99	.55	4.30
Licenses and bonds	.01	---	.05	---	.06
Interest on investment	3.32	7.37	3.83	2.15	16.67
Total Fixed Cost	12.30	22.67	8.76	8.08	51.81
Variable Costs:					
Direct labor	1.90	7.97	2.45	1.06	13.38
Administrative overhead	1.64	4.72	1.55	1.24	9.15
Electricity	.21	1.79	.28	.08	2.36
Dryer fuel	---	3.75	---	---	3.75
Truck expense	---	1.22	---	---	1.22
Building repairs	.02	.18	.18	.02	.40
Equipment repairs	1.22	2.23	.88	.88	5.21
Insurance on rice	---	---	.03	---	.03
Taxes on rice	---	---	.01	---	.01
Fumigation	---	---	.06	---	.06
Other	.71	2.62	.76	.29	4.38
Interest on working capital	.10	.36	.12	.07	.65
Total Variable Cost	5.80	24.84	6.32	3.64	40.60
TOTAL COST	18.10	47.51	15.08	11.72	92.41

---* = No allocation of this cost item made to this function.

Sums of individual cost items may not total due to rounding.

¹See Footnote to Table 6.

Table 9. Small facility, 1.80 turn-over ratio: Estimated annual average cost for receiving, drying, storing and loading out rough rice, 1978.¹

Cost Item	Receiving by Truck	Drying	Storing	Loading Out	Total Cost
-----cents per cwt-----					
Fixes Costs:					
Building depreciation	.17	1.44	1.60	.09	3.30
Equipment depreciation	5.80	8.35	1.37	3.88	19.40
Insurance---building and equipment	.11	.26	.14	.08	.59
Taxes---building and equipment	.64	1.42	.79	.41	3.26
Licenses and bonds	.01	---	.04	---	.05
Interest on investment	2.50	5.53	3.07	1.61	12.71
Total Fixed Cost	9.23	17.00	7.01	6.07	39.31
Variable Costs:					
Direct labor	1.75	5.99	2.08	1.38	11.20
Administrative overhead	1.35	3.96	1.02	1.08	7.41
Electricity	.19	1.62	.27	.08	2.16
Dryer fuel	---	3.71	---	---	3.71
Truck expenses	---	4.72	---	---	4.72
Building repairs	.02	.18	.18	.02	.40
Equipment repairs	1.10	2.01	.79	.78	4.68
Insurance on rice	---	---	.03	---	.03
Taxes on rice	---	---	.01	---	.01
Fumigation	---	---	.06	---	.06
Other	.63	2.54	.64	.45	4.26
Interest on working capital	.10	.26	.10	.07	.53
Total Variable Cost	5.14	24.99	5.18	3.86	39.17
TOTAL COST	14.37	41.99	12.19	9.93	78.48

---* = No allocation of this cost item made to this function.

Sums of individual cost items may not total due to rounding.

¹See Footnote to Table 6.

Table 10. Medium facility, .45 turn-over ratio: Estimated annual average cost for receiving, drying, storing and loading out rough rice, 1978.¹

Cost Item	Receiving by Truck	Drying	Storing	Loading Out	Total Cost
-----cents per cwt-----					
Fixed Costs:					
Building depreciation	.58	4.76	3.84	.29	9.47
Equipment depreciation	17.37	30.30	3.09	11.91	62.67
Insurance---building and equipment	.34	.91	.34	.23	1.82
Taxes---building and equipment	2.36	6.11	2.28	1.58	12.33
Licenses and bonds	.02	---*	.15	---*	.17
Interest on investment	7.60	19.42	7.26	5.08	39.36
Total Fixed Cost	28.27	61.50	16.96	19.09	125.82
Variable Costs:					
Direct labor	1.75	8.08	1.60	1.06	12.49
Administrative overhead	8.16	6.50	1.67	7.53	23.86
Electricity	.23	1.86	.21	.06	2.36
Dryer fuel	---*	3.56	---*	---*	3.56
Truck expense	---*	1.39	---*	---*	1.39
Building repairs	.02	.11	.09	²	.22
Equipment repairs	.90	1.90	.62	.61	4.03
Insurance on rice	---*	---*	.03	---*	.03
Taxes on rice	---*	---*	.01	---*	.01
Fumigation	---*	---*	.06		.06
Other	1.50	2.64	.56	1.26	5.96
Interest on working capital	.23	.44	.11	.19	.97
Total Variable Cost	12.79	26.48	4.96	10.71	54.94
TOTAL COST	41.06	87.98	21.92	29.80	180.76

---* = No allocation of this cost item made to this function.

Sums of individual cost items may not total due to rounding.

¹See Footnote to Table 6.

²Less than .01.

Table 11. Medium facility, .90 turn-over ratio: Estimated annual average cost for receiving, drying, storing and loading out rough rice, 1978.¹

Cost Item	Receiving by Truck	Drying	Storing	Loading Out	Total Cost
-----cents per cwt-----					
Fixed Costs:					
Building depreciation	.29	2.38	2.56	.15	5.38
Equipment depreciation	8.69	15.15	2.06	5.96	31.86
Insurance—building and equipment	.16	.45	.23	.11	.95
Taxes—building and equipment	1.18	3.05	1.52	.79	6.54
Licenses and bonds	²	---*	.10	---*	.10
Interest on investment	3.81	9.72	4.84	2.54	20.91
Total Fixed Cost	14.13	30.75	11.31	9.55	65.74
Variable Costs:					
Direct labor	1.63	6.52	1.31	.68	10.14
Administrative overhead	4.09	3.25	1.11	3.77	12.22
Electricity	.17	1.48	.17	.06	1.88
Dryer fuel	---*	3.48	---*	---*	3.48
Truck expense	---*	.81	---*	---*	.81
Building repairs	.02	.11	.09	²	.22
Equipment repairs	.82	1.75	.57	.56	3.70
Insurance on rice	---*	---*	.03	---*	.03
Taxes on rice	---*	---*	.01	---*	.01
Fumigation	---*	---*	.06	---*	.06
Other	.91	1.85	.46	.69	3.91
Interest on working capital	.13	.29	.08	.10	.60
Total Variable Cost	7.77	19.54	3.89	5.86	37.06
TOTAL COST	21.90	50.29	15.20	15.41	102.80

---* = No allocation of this cost item made to this function.

Sums of individual cost items may not total due to rounding.

¹See Footnote to Table 6.

²Less than .01.

Table 12. Medium facility, 1.35 turn-over ratio: Estimated annual average cost for receiving, drying, storing and loading out rough rice, 1978.¹

Cost Item	Receiving by Truck	Drying	Storing	Loading Out	Total Cost
-----cents per cwt-----					
Fixed Costs:					
Building depreciation	.19	1.59	1.92	.10	3.80
Equipment depreciation	5.80	10.09	1.54	3.98	21.41
Insurance—building and equipment	.11	.31	.16	.08	.66
Taxes—building and equipment	.79	2.03	1.14	.53	4.49
Licenses and bonds	²	—*	.08	—*	.08
Interest on investment	2.53	6.48	3.63	1.70	14.34
Total Fixed Cost	9.42	20.50	8.47	6.39	44.78
Variable Costs:					
Direct labor	1.59	5.07	1.15	.50	8.31
Administrative overhead	2.87	2.29	.88	2.66	8.70
Electricity	.17	1.33	.15	.04	1.69
Dryer fuel	—*	3.44	—*	—*	3.44
Truck expense	—*	.64	—*	—*	.64
Building repairs	.02	.11	.09	²	.22
Equipment repairs	.76	1.59	.52	.52	3.39
Insurance on rice	—*	—*	.03	—*	.03
Taxes on rice	—*	—*	.01	—*	.01
Fumigation	—*	—*	.06	—*	.06
Other	.73	1.65	.42	.51	3.31
Interest on working capital	.10	.24	.07	.07	.48
Total Variable Cost	6.24	16.36	3.38	4.30	30.28
TOTAL COST	15.66	36.86	11.85	10.69	75.06

---* = No allocation of this cost item made to this function.

Sums of individual cost items may not total due to rounding.

¹See Footnote to Table 6.

²Less than .01.

Table 13. Medium facility, 1.80 turn-over ratio: Estimated annual average cost for receiving, drying, storing and loading out rough rice, 1978.¹

Cost Item	Receiving by Truck	Drying	Storing	Loading Out	Total Cost
-----cents per cwt-----					
Fixed Costs:					
Building depreciation	.15	1.20	1.54	.06	2.95
Equipment depreciation	4.35	7.57	1.23	2.98	16.13
Insurance—building and equipment	.08	.23	.13	.06	.50
Taxes—building and equipment	.59	1.52	.91	.39	3.41
Licenses and bonds	²	---	.06	---	.06
Interest on investment	1.90	4.86	2.91	1.28	10.95
Total Fixed Cost	7.07	15.38	6.78	4.77	34.00
Variable Costs:					
Direct labor	1.37	3.91	1.06	.50	6.84
Administrative overhead	2.16	1.72	.71	2.00	6.59
Electricity	.15	1.24	.14	.04	1.57
Dryer fuel	---	3.40	---	---	3.40
Truck expense	---	.55	---	---	.55
Building repairs	.02	.11	.09	²	.22
Equipment repairs	.68	1.43	.46	.47	3.04
Insurance on rice	---	---	.03	---	.03
Taxes on rice	---	---	.01	---	.01
Fumigation	---	---	.06	---	.06
Other	.59	1.38	.38	.41	2.76
Interest on working capital	.09	.20	.06	.06	.41
Total Variable Cost	5.06	13.94	3.00	3.48	25.48
TOTAL COST	12.13	29.32	9.78	8.25	59.48

---* =No allocation of this cost item made to this function.

Sums of individual cost items may not total due to rounding.

¹See Footnote to Table 6.

²Less than .01.

Table 14. Large facility, .45 turn-over ratio: Estimated annual average cost for receiving, drying, storing and loading out rough rice, 1978.¹

Cost Item	Receiving by Truck	Drying	Storing	Loading Out	Total Cost
-----cents per cwt-----					
Fixed Costs:					
Building depreciation	.54	3.72	3.41	.23	7.90
Equipment depreciation	17.90	21.57	3.00	9.23	51.70
Insurance---building and equipment	.34	.66	.31	.17	1.48
Taxes---building and equipment	2.30	4.22	1.99	1.16	9.67
Licenses and bonds	²	---	.16	---	.16
Interest on investment	7.75	14.11	6.66	3.94	32.46
Total Fixed Cost	28.83	44.28	15.53	14.73	103.37
Variable Costs:					
Direct labor	1.61	6.42	1.84	1.13	11.00
Administrative overhead	4.86	3.88	.99	4.49	14.22
Electricity	.17	1.58	.17	.06	1.98
Dryer fuel	---	2.85	---	---	2.85
Truck expense	---	.83	---	---	.83
Building repairs	.02	.09	.08	²	.19
Equipment repairs	.88	1.60	.52	.56	3.56
Insurance on rice	---	---	.03	---	.03
Taxes on rice	---	---	.01	---	.01
Fumigation	---	---	.06	---	.06
Other	1.00	2.29	.48	.85	4.62
Interest on working capital	.16	.36	.09	.13	.74
Total Variable Cost	8.70	19.90	4.27	7.22	40.09
TOTAL COST	37.53	64.18	19.80	21.95	143.46

---* = No allocation of this cost item made to this function.

Sums of individual cost items may not total due to rounding.

¹See Footnote to Table 6.

²Less than .01.

Table 15. Large facility, .90 turn-over ratio: Estimated annual average cost for receiving, drying, storing and loading out rough rice, 1978.¹

Cost Item	Receiving by Truck	Drying	Storing	Loading Out	Total Cost
-----cents per cwt-----					
Fixed Costs:					
Building depreciation	.27	1.85	2.27	.12	4.51
Equipment depreciation	8.94	10.78	2.00	4.61	26.33
Insurance—building and equipment	.17	.32	.21	.09	.79
Taxes—building and equipment	1.16	2.11	1.33	.59	5.19
Licenses and bonds	²	---	.10	---	.10
Interest on investment	3.88	7.06	4.44	1.97	17.35
Total Fixed Cost	14.42	22.12	10.35	7.38	54.27
Variable Costs:					
Direct labor	.63	4.97	1.46	.87	7.93
Administrative overhead	2.54	2.03	.69	2.35	7.61
Electricity	.15	1.35	.14	.06	1.70
Dryer fuel	---	2.82	---	---	2.82
Truck expense	---	.55	---	---	.55
Building repairs	.02	.09	.08	²	.19
Equipment repairs	.82	1.46	.48	.51	3.27
Insurance on rice	---	---	.03	---	.03
Taxes on rice	---	---	.01	---	.01
Fumigation	---	---	.06	---	.06
Other	.55	1.73	.41	.51	3.20
Interest on working capital	.09	.26	.07	.07	.49
Total Variable Cost	4.80	15.26	3.43	4.37	27.86
TOTAL COST	19.22	37.38	13.78	11.75	82.13

---* = No allocation of this cost item made to this function.

Sums of individual cost items may not total due to rounding.

¹See Footnote to Table 6.

²Less than .01.

Table 16. Large facility, 1.35 turn-over ratio: Estimated annual average cost for receiving, drying, storing and loading out rough rice, 1978.¹

Cost Item	Receiving by Truck	Drying	Storing	Loading Out	Total Cost
-----cents per cwt-----					
Fixed Costs:					
Building depreciation	.17	1.24	1.71	.07	3.19
Equipment depreciation	5.97	7.19	1.50	3.08	17.74
Insurance—building and equipment	.12	.22	.15	.05	.54
Taxes—building and equipment	.77	1.40	1.00	.39	3.56
Licenses and bonds	²	---*	.08	---*	.08
Interest on investment	2.58	4.71	3.33	1.31	11.93
Total Fixed Cost	9.61	14.76	7.77	4.90	37.04
Variable Costs:					
Direct labor	.60	4.10	1.26	.71	6.67
Administrative overhead	1.77	1.42	.54	1.64	5.37
Electricity	.15	1.27	.13	.04	1.59
Dryer fuel	---*	2.82	---*	---*	2.82
Truck expense	---*	.46	---*	---*	.46
Building repairs	.02	.09	.08	²	.19
Equipment repairs	.73	1.33	.43	.46	2.95
Insurance on rice	---*	---*	.03	---*	.03
Taxes on rice	---*	---*	.01	---*	.01
Fumigation	---*	---*	.06	---*	.06
Other	.43	1.44	.36	.37	2.60
Interest on working capital	.07	.20	.06	.06	.39
Total Variable Cost	3.77	13.13	2.96	3.28	23.14
TOTAL COST	13.38	27.89	10.73	8.18	60.18

---* = No allocation of this cost item made to this function.

Sums of individual cost items may not total due to rounding.

¹See Footnote to Table 6.

²Less than .01.

Table 17. Large facility, 1.80 turn-over ratio: Estimated annual average cost for receiving, drying, storing and loading out rough rice, 1978.¹

Cost Item	Receiving by Truck	Drying	Storing	Loading Out	Total Cost
-----cents per cwt-----					
Fixed Costs:					
Building depreciation	.14	.94	1.37	.05	2.50
Equipment depreciation	4.47	5.39	1.20	2.31	13.37
Insurance—building and equipment	.09	.17	.12	.05	.43
Taxes—building and equipment	.57	1.06	.80	.30	2.73
Licenses and bonds	²	---	.07	---	.07
Interest on investment	1.94	3.52	2.66	.99	9.11
Total Fixed Cost	7.21	11.08	6.22	3.70	28.21
Variable Costs:					
Direct labor	.43	3.15	1.17	.48	5.23
Administrative overhead	1.34	1.06	.43	1.22	4.05
Electricity	.13	1.22	.12	.04	1.51
Dryer fuel	---	2.78	---	---	2.78
Truck expense	---	.42	---	---	.42
Building repairs	.02	.09	.08	²	.19
Equipment repairs	.66	1.19	.39	.43	2.67
Insurance on rice	---	---	.03	---	.03
Taxes on rice	---	---	.01	---	.01
Fumigation	---	---	.06	---	.06
Other	.33	1.18	.34	.30	2.15
Interest on working capital	.06	.17	.06	.04	.33
Total Variable Cost	2.97	11.26	2.69	2.51	19.43
TOTAL COST	10.18	22.34	8.91	6.21	47.64

---* = No allocation of this cost item made to this function.

Sums of individual cost items may not total due to rounding.

¹See Footnote to Table 6.

²Less than .01.

Selected References

1. Holder, Shelby H. Jr., Joseph L. Ghetti, and Zolon M. Lonney, **Costs of Building and Operating Rice Drying and Storage Facilities in the South**, Market Research Report No. 1011, ERS, USDA, September 1973.
2. Holder, Shelby H. Jr., Dale L. Shaw, and James C. Snyder, **A Systems Model of the U. S. Rice Industry**, Technical Bulletin No. 1453, ERS, USDA, November 1971.
3. U. S. Department of Commerce, **Survey of Current Business**, Selected issues.

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In conformity with Title IX of the Education Amendments of 1972 and Section 504 of the Rehabilitation Act of 1973, Dr. T. K. Martin, Vice President, 610 Allen Hall, P. O. Drawer J, Mississippi State, Mississippi 39762, office telephone number 325-3221, has been designated as the responsible employee to coordinate efforts to carry out responsibilities and make investigation of complaints relating to nondiscrimination.



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