

Economic Analysis of Selected Rice Varieties

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Executive Summary

Delta rice producers can currently choose between several rice varieties. The varieties differ in terms of rough rice yield, milling yield, susceptibility to diseases, straw strength, as well as herbicide tolerance. Rough rice yield and milling percentages were obtained from MSU on-farm variety trials. The data are a two-year average for all varieties (Kanter et. al). Direct and fixed costs are obtained by using the Mississippi State Budget Generator (MSBG). The analysis is based on a “worst case” scenario in order to standardize the analysis. Thus, fungicide applications are included in the cost of production depending upon a variety’s susceptibility to disease. Based strictly on cost of production estimates, Priscilla appears to have an advantage. The hybrid varieties are the most expensive to produce. When calculated at loan value, Cheniere provides the highest returns per bushel. XP710 and Priscilla provided the lowest returns per bushel. Cheniere provided the highest total returns per acre. Clearfield 161 had the lowest returns per acre. An interesting part of the analysis is the comparison of value per bushel and total returns. The varieties that provided some of the higher values per bushel (based on milling grade) provided some of the lowest total returns per acre due to lower (rough rice) yields. Thus, under the pricing structures used in this analysis, rough rice yield is very important. A template of an inter-active producer budget and per acre returns table shown in the appendix are designed for producers to develop their own analysis. By placing individual cost of production estimates and milling grades in the spreadsheet, producers can estimate per acre costs for their individual farms. The inter-active budget and spreadsheet are available at www.msstate.edu/dept/drec.

Introduction

Delta rice producers can currently choose between several rice varieties. The varieties differ in terms of rough rice yield, milling yield, susceptibility to diseases, straw strength, as well as herbicide tolerance. In order to choose the variety that maximizes potential returns, all factors must be considered. This analysis is an attempt to quantify each of these factors into either a cost or return value. The relationship between rough rice yield and milling yield is also considered. Additionally, a producer cost and return spreadsheet is developed that allows producers to perform their own analysis based on their farm yields and management practices.

Materials and Methods

Rough rice yield and milling percentages were obtained from MSU on-farm variety trials. The data are a two-year average for all varieties (Kanter et. al). Value per bushel is based on loan rate calculations of \$10.61 per hundred weight for whole grains and \$5.31 per hundred weight for brokens (assumes \$6.64/cwt for 55/70 milling).

Direct and fixed costs are calculated using the Mississippi State Budget Generator (MSBG) and follow the general framework and procedures defined within the MSBG program (Laughlin and Spurlock). The MSBG is the program used to produce all of the Mississippi State Planning Budgets as well as planning budgets for several other states. Direct costs are those costs associated with actually producing the crop. Fixed costs per acre are the costs associated with ownership of farm machinery and equipment. Total specified costs per acre, which is the sum of direct and fixed costs, are also presented. These costs are referred to as specified costs because they represent only the costs specified in the budget. The specified costs in these budgets do not include land costs, general farm overhead or any returns to management.

This analysis is based on a “worst case” scenario in order to standardize the analysis. The cost of a fungicide treatment was added to the cost of production when a variety was rated very susceptible to sheath blight or kernel smut. A fungicide application was added to the cost of production of a variety if the variety was rated susceptible to blast. Every farm is different and disease and insect pressure varies by field. Thus, all fungicide treatments might not have to be made in every situation as assumed in this analysis. Not all varieties will require an insecticide application each year and therefore the cost of production will vary depending upon location and weather. Producers should consider their own situation on a case by case basis. The cost of draining Cocodrie for straighthead was not included although it is rated very susceptible. Draining would be required if Cocodrie is grown on lighter soils but is generally not required for heavy clay soils.

Results

Table 1 presents cost of production estimates for each of the nine rice varieties included in this analysis. The second column shows direct costs per acre, the third column fixed costs per acre, and the fourth column total specified costs per acre.

Based strictly on cost of production estimates, Priscilla appears to have an advantage. The hybrid lines, Clearfield XL8, and XP710 are the most expensive to produce. The other varieties are grouped closely together in terms of cost of production. It should be pointed out that the cost of production estimates include a cost for hauling rice (\$0.10 per bushel) and a cost for drying rice (\$0.40 per bushel). Therefore, those varieties having higher yields will incur higher costs in these categories. **Tables 2** through **4** further explain the methods for determining cost of production for the rice varieties.

Table 2 compares direct expense items for each variety. When considering **Table 2**, **Tables 3** and **4** should also be considered. **Table 3** shows estimated fungicide applications and the cost of those applications. The fungicide applications shown are based on a “worst case” scenario.

Table 4 shows estimated insecticide applications and the costs of those applications. Again, this is based on a worst case scenario and producers should consider their individual situations. As can be seen in **Table 4**, all varieties are susceptible to both stinkbug and rice water weevil damage. Therefore in comparing varieties these insecticide costs are equal across all varieties. However, inclusion of these costs does affect the returns over costs shown in **Table 6**.

Other major differences in cost of production are in the herbicide, fertilizer, hauling and drying categories. Again, those varieties with higher rough rice yields will incur more costs for hauling and drying.

Table 5 shows rough rice yield, milling percentages and value per bushel. Rice prices above loan value might change this portion of the analysis. Additionally, loan deficiency payments (LDP) and/or marketing premiums above loan could increase value per bushel. Most often these premiums or LDPs are on a rough rice basis, thus favoring higher yielding varieties.

When calculated at loan value, Cheniere provides the highest returns per bushel. Cocodrie and Clearfield 161 follow closely. XP710 and Priscilla provide the lowest returns per bushel.

Table 6 shows returns above costs for each of the rice varieties. Total returns are given in column two and are calculated based on the value per bushel and rough rice yield data given in **Table 5**. Columns three and four of **Table 6** give returns above direct costs and returns above total specified costs. These costs are calculated based on the total returns given in column two and the costs of production estimates given in **Table 1**. Cheniere and XP710 provide the highest total returns per acre. Clearfield 161 had the lowest returns per acre. However, Clearfield 161 may still fit in a producer’s program/rotation if red rice is a problem. Given the cost of production shown in **Table 1**, Cheniere provides the highest per acre returns above total costs followed by Francis.

An interesting part of this analysis is the comparison of value per bushel and total returns. The varieties that provided some of the higher values per bushel (based on milling grade) provided

some of the lowest total returns due to lower (rough rice) yields. Thus, under the pricing structures used in this analysis, rough rice yield is very important. Additionally, loan deficiency payments (LDP), and some marketing premiums could possibly be paid on a rough rice basis.

NOTE:

The budget template and per acre returns table in the appendix are designed for producers to develop their own analysis. By placing individual cost of production expenses in each of the columns, producers can estimate per acre costs for their individual farms. The per acre returns section is designed to link with the producer budget in an Excel spreadsheet. (This program can be downloaded from the DREC web site at www.msstate.edu/dept/drec. Producers must put in a total milling yield (percentage) and whole grain yield percentage. The spreadsheet will calculate broken percentage and value per bushel (\$10.61 for whole grain and \$5.31 for brokens). Producers must also enter a rough rice per acre yield. The spreadsheet will then calculate total returns, returns above direct costs (based on the cost data the producer enters into the budget), and returns above total costs (based on the producer budget).

This analysis is intended only as a guide. Additional years of data and different locations would provide further insight. Producers should consider their own farms, yields and situations when selecting varieties. In addition, the hybrid rice varieties were fertilized according to conventional varieties. Thus, the milling values of the hybrid varieties used here may be lower than if fertilized according to hybrid recommendations.

References

Kanter, Dwight G., Theodore C. Miller and Joe E. Street. 2003. Rice Variety Trials 2003. MAFES Information Bulletin 403.

Kanter, Dwight G., Theodore C. Miller, Walter Soloman, George Baird, III and Tim Walker. Rice Variety Trials 2004. MAFES Information Bulletin .

Laughlin, David H. and Stan R. Spurlock. "Mississippi State Budget Generator User's Guide Version 5.5 for Windows. Available on the web at <http://www.agecon.msstate.edu/researchandinformation/software.asp>.

Delta 2004 Planning Budgets. Mississippi State University Agricultural Economics Budget Report 2003-006. December 2003.

Table 1. Production Costs per Acre for Selected Rice Varieties

Variety	Direct Costs	Fixed Costs	Total Specified Costs
Clearfield XL8	\$475	\$66	\$542
Clearfield161	\$427	\$66	\$493
Cheniére	\$421	\$66	\$487
Cocodrie	\$419	\$66	\$484
Francis	\$400	\$66	\$466
Priscilla	\$364	\$66	\$430
Wells	\$399	\$66	\$465
XP710	\$441	\$66	\$506

*Specified costs do not include land charges, general farm overhead or returns to management.

Table 2. Selected Per Acre-Direct Cost Comparison of Selected Rice Varieties

Direct Costs	Clearfield XL8	Clearfield 161	Cheniére	Cocodrie	Francis	Priscilla	Wells	XP 710
Custom Spray (airplane)	\$16	\$24	\$24	\$24	\$20	\$16	\$20	\$16
Fungicides	\$0	\$42	\$42	\$42	\$27	\$0	\$27	\$0
Herbicides	\$77	\$77	\$59	\$59	\$59	\$59	\$59	\$59
Seed	\$109	\$29	\$18	\$18	\$18	\$18	\$18	\$85
Dry Rice (\$0.40 per bushel)	\$84	\$71	\$82	\$81	\$82	\$78	\$80	\$87
Hauling	\$21	\$18	\$21	\$20	\$20	\$19	\$20	\$22
Interest on Operating Capital	\$8	\$7	\$6	\$6	\$6	\$6	\$6	\$7
Custom Fertilizer Application	\$21	\$21	\$23	\$23	\$23	\$23	\$23	\$21
Fertilizers	\$50	\$50	\$51	\$51	\$51	\$51	\$51	\$50
Diesel Fuel	\$33	\$33	\$32	\$32	\$32	\$32	\$32	\$32
Repair & Maintenance	\$16	\$16	\$16	\$16	\$16	\$16	\$16	\$16
Insecticides	\$6	\$6	\$6	\$6	\$6	\$6	\$6	\$6

Table 3. Assumed Fungicide Applications per Variety.

Variety	Disease		
	Sheath Blight * @ \$26.62 per application plus aerial application fee	Blast** @ \$26.62 per application plus aerial application fee	Smut*** @ \$15.24 per application plus aerial application fee
Clearfield XL8			
Clearfield 161	1 application		1 application

Cheniere		1 application	1 application
Cocodrie	1 application		1 application
Francis		1 application	
Priscilla			
Wells		1 application	
XP710			

Table 4. Assumed Insecticide Applications per Variety.

Variety	Target Pests
	Rice Water Weevil*/Stink Bug** 1 application @ \$6.08 plus aerial application fee
Clearfield XL8	1 application
Clearfield 161	1 application
Cheniere	1 application
Cocodrie	1 application
Francis	1 application
Priscilla	1 application
Wells	1 application
XP710	1 application

Table 5. Rough Rice Yields, Milling Percentages and Value per Bushel

Variety	Rough Rice Yield Bushels per acre	Milling Yield %			Value per bushel (rough rice)
		% Total	% Whole	% Broken	
Clearfield XL8	211	71.3	56.3	15	\$3.05
Clearfield 161	170	70.3	62.8	7.5	\$3.18
Cheniere	206	71.8	62.8	9	\$3.21
Cocodrie	202	70.9	62.3	8.6	\$3.18
Francis	209	70.4	57.3	13.1	\$3.05
Priscilla	194	69.4	57.7	11.7	\$3.03
Wells	201	71.5	57	14.5	\$3.07
XP710	217	70	56.7	13.3	\$3.02

- Value per bushel based on \$10.61 for whole grain and \$5.31 for brokens or \$6.64 for 55/70.

Table 6. Per Acre Returns – Specified Rice Varieties.

Variety	Total returns	Returns above direct costs	Returns above total specified cost
Clearfield XL8	\$643	\$167	\$101
Clearfield 161	\$540	\$113	\$48
Cheniére	\$662	\$241	\$175
Cocodrie	\$642	\$223	\$158
Francis	\$637	\$237	\$171
Priscilla	\$589	\$224	\$159
Wells	\$617	\$218	\$152
XP710	\$656	\$216	\$150

Your Farm	0	0	0	\$0.00	\$0.00	0
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**Total
Returns**

**Total Returns
Above Direct Costs**

**Total Returns
Above Total Costs**

Variety

CLXL8 \$640.00

\$168.00

\$99.00

Your Farm \$0.00

\$0.00

\$0.00