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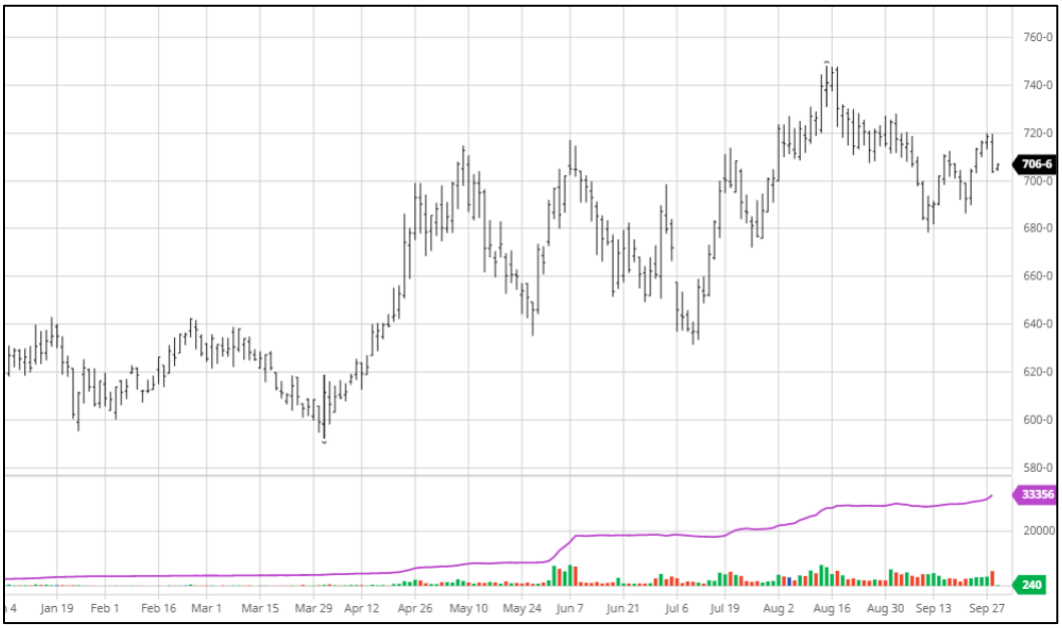
The Economic Potential of Wheat Production in 2022

Dr. Michael A. Deliberto
Louisiana State University Agricultural Center
Department of Agricultural Economics & Agribusiness

This fall, producers will begin field preparations for next year's wheat crop. Current market information implies that wheat prices are expected to remain 'relatively good' between now and June 2022. This information also may imply that prices may remain relatively volatile. Prices have been volatile because of significant production uncertainty and prices increased because of changes in market expectations. Figure 1. World wheat marketing year production estimates for 2021/22 have declined from June's estimate of 29.2 billion bushels to 28.7 billion bushels in September. World wheat ending stocks estimates have declined from 10.9 billion bushels to 10.4 billion bushels. Projected U.S. ending stocks have been reduced 12 million bushels to 615 million and are 27 percent below last year and the lowest in eight years. Lower world and U.S. wheat production and ending stocks projections resulted in higher prices. USDA forecasts reduced supplies, indicated slightly higher domestic use, left exports unchanged, and decreased ending stocks for 2021/22. The projected 2021/22 season-average farm price is to $6.60 on reported NASS prices to date and price expectations for the remainder of 2021/22.

Figure 1. July 2022 Wheat futures ($7.066) from the CBOT market snapshot on September 28th.



The July 2021 all-wheat farmgate price was estimated at $6.26, which is up from $6.24 in June 2021 and substantially above the $4.54 in July 2020. Although futures prices remain robust and future months are

expected to show larger farmgate prices, July is typically the largest month of wheat marketing, which makes it unlikely that the season average farm price will reach the previously estimated target,

The global wheat outlook for 2021/22 is for increased supplies, higher consumption, more trade, and higher ending stocks. Export quotes for all U.S. wheat classes moved higher again in September. Soft White Winter (SWW) rose a dramatic $92 per ton to a remarkable $450 nearly double what it was one year ago. So far this marketing year, demand has remained strong with exports of this class down less than 10 percent year to date, despite production being down by nearly one-third and the lowest in decades based on low yields.

Wheat acres in Louisiana have declined, mirroring the national trend in wheat acres over the past half-decade. While wheat was once a crop that commanded several hundred thousands of acres in the state, wheat acres in Louisiana have been at or below 25,000 acres for the past three years. Wheat is a crop that competes for acreage with corn, soybeans, and cotton. Recently, challenging economics for wheat as both a feed input and as an export commodity are said to be one of the primary causes for the both the national and regional pivot away from wheat. This turning away from wheat for other commodities have allowed wheat acreage in the Mississippi Delta Region to fall to historic lows. Figure 2. The price received for wheat in Louisiana has increased over the short term, partially offsetting the price decline observed from 2013 to 2017. Figure 3.

Figure 2. Planted wheat acres in the Mississippi River Delta Region, 2000-2020.

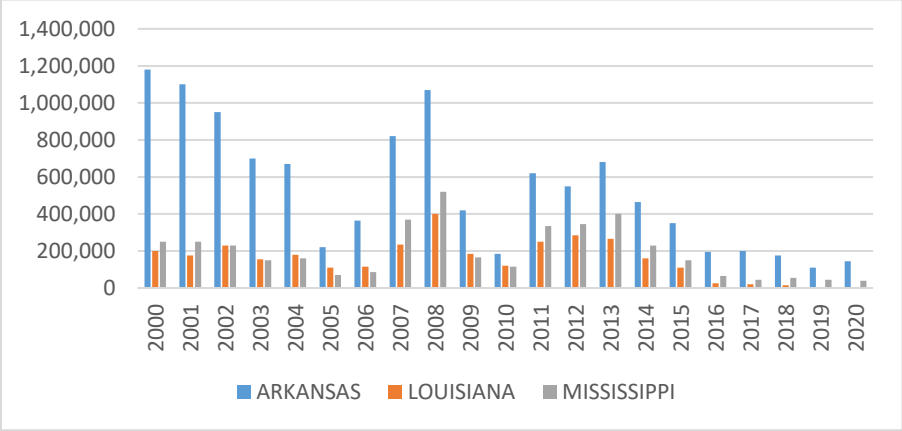
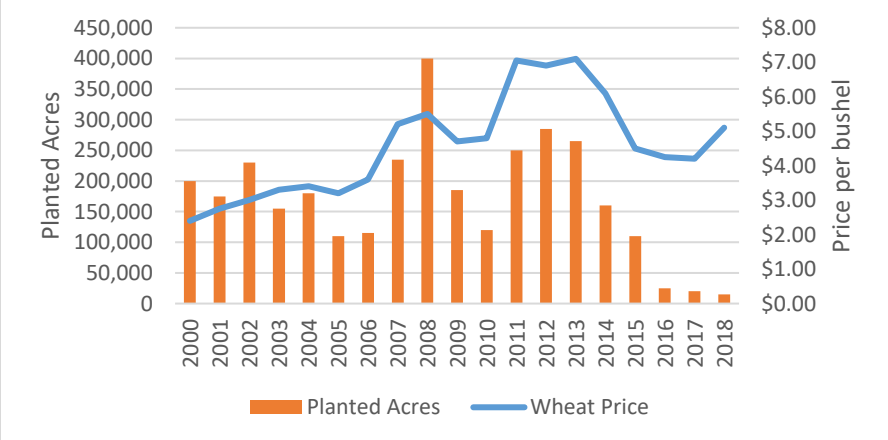


Figure 3. Wheat acres and price in Louisiana, 2000 to 2018.



The LSU AgCenter notes that planting dates for Louisiana wheat depend on location and variety. For southern and central Louisiana optimal planting dates range from November 1st through November 30th. Optimal planting dates for northern Louisiana are slightly earlier, ranging from October 15th through November 15th. Early-heading varieties should generally be planted after the mid-date, while late-heading varieties can be pushed a little on the early side of the planting window.

Nitrogen fertilization of wheat can be a challenging aspect of production. Total *N* application should normally range from 90 to 120 pounds per acre, but this will vary depending on soil type and rainfall after applications. Timing of *N* application depends on several factors. The wheat crop needs adequate *N* in the fall and early winter to establish ground cover and properly tiller; however, excessive levels of fall *N* can result in rank growth and increased lodging potential, as well as a higher probability of spring freeze damage from early heading. If the wheat crop is following soybeans, soil residual or mineralizable *N* should be adequate for fall growth, and no pre-plant *N* is needed. However, if the wheat crop follows corn, sorghum, rice or cotton, the application of 15 to 20 pounds of *N* per acre would typically be beneficial. Where the wheat crop is planted later than optimum, additional *N* may be necessary to ensure adequate fall growth prior to winter conditions. Phosphorus, *K*, and micronutrients should be applied in the fall based on soil test reports.

However, given the cost structure of wheat production in Louisiana, it can be a viable enterprise for a farming operation. Compared to corn, cotton, and soybeans, wheat is a less-intensive crop. The majority of production costs for wheat are associated with fertilizer and its application. Fertilizer rates of 90-40-40 (*N-P-K*) are assumed in the LSU AgCenter's enterprise budgets but soil fertility needs can vary farm-to-farm. Figure 4. Therefore, the cost of fertilizer can have a significant impact on the cost and, hence, the associated net returns of wheat. Any input price increases for *N*, *P*, and/or *K* will result in a proportionate share increase. Vice-versa, an absence of fertilizer input price volatility can strengthen wheat's net return potential, all things equal.

Using the "Custom Wheat Enterprise Budget" developed in Microsoft® Excel, producers can evaluate their return margin and cost structure for the upcoming wheat crop via a detailed costs and returns spreadsheet. Cells containing **blue numbers** can be changed by the producer to reflect their share rent percentage, production situation, and price/yield expectations. Figure 4. Formulas used to calculate landlord and producers' (tenant) shares are embedded in the file. The producer can elect to enter their expected price, yield, and share rental percentage in cells C7, D7, and F7. For a situation where the farm operator is the owner/operator, 0% can be entered. The opportunity is also presented to a tenant producer to indicate what, if any, production costs are shared between themselves and the landowner. Direct expense categories for custom applications, fertilizers, herbicides, insecticides, seed, hauling, labor, diesel fuel, repair, and interest on capital are listed in the farm management tool and intended to be specified on a unit cost and corresponding quantity basis. Total direct expenses are calculated based on the tenant's share of the associated production costs per acre (summed in cell H43). The tenant's share of production is compared to their share of direct expenses so as to calculate the returns above direct expenses (cell H44). The same procedure is used to calculate the tenants' share of fixed production expenses (e.g. ownership cost for machinery) for implements, tractors, and combine harvester. The values contained in the farm management tool are default values. It is suggested that the producer update the input prices and/or amount to reflect current farm input prices and their localized production situation. Total fixed expenses and specified expenses are summed in cells H50 and H51. The tenant's share of total returns above total specified expenses are calculated in cell H52.

Figure 4. Example of user interface of the wheat enterprise budget for Louisiana producers.

	A	B	C	D	E	F	G	H
1	Estimated costs and returns per acre							
2	Wheat, Produced on Alluvial Soils, Non-irrigated Practice							
3	Louisiana							
4						Landlord		Tenant
5	ITEM	UNIT	PRICE	QUANTIT	Total Amou	Share %	Share	Share
6	INCOME							
7	Wheat	bu	$ 6.15	60.00	$ 369.00	20.0%	$73.80	$ 295.20
8	TOTAL INCOME				$ 369.00		$73.80	$ 295.20
9								
10	DIRECT EXPENSES							
11	*CUSTOM SPRAY*							
12	App by Air (5 gal)	appl	$ 7.00	1.00	$ 7.00	0.0%	$ -	$ 7.00
13	App by Air (3 gal)	appl	$ 5.50	2.00	$ 11.00	0.0%	$ -	$ 11.00
14	*FERTILIZERS*							
15	Phosphate	lb	$ 0.65	40.00	$ 26.00	0.0%	$ -	$ 26.00
16	Potash	lb	$ 0.41	40.00	$ 16.40	0.0%	$ -	$ 16.40
17	Nitrogen	lb	$ 0.60	90.00	$ 54.00	0.0%	$ -	$ 54.00
18	*HERBICIDES*							
19	Harmony Extra	oz	$ 11.03	0.45	$ 4.96	0.0%	$ -	$ 4.96
20	*INSECTICIDES*							
21	Surfactant	pt	$ 3.30	0.20	$ 0.66	0.0%	$ -	$ 0.66
22	Mustang Max	oz	$ 1.50	4.00	$ 6.00	0.0%	$ -	$ 6.00
23	Karate Z	oz	$ 1.00	2.13	$ 2.13	0.0%	$ -	$ 2.13
24	*SEED/PLANTS*							
25	Wheat Seed	lb	$ 0.28	90.00	$ 25.20	0.0%	$ -	$ 25.20
26	*CUSTOM FERTILIZE*							
27	Lime (Spread)	ton	$ 38.00	0.33	$ 12.54	0.0%	$ -	$ 12.54
28	*HAULING*							
29	Haul	bu	$ 0.26	60.00	$ 15.60	0.0%	$ -	$ 15.60
30	*OPERATOR LABOR*							
31	Harvester	hour	$ 15.30	0.08	$ 1.25	0.0%	$ -	$ 1.25
32	*HIRED LABOR*							
33	Implements	hour	$ 11.83	0.11	$ 1.30	0.0%	$ -	$ 1.30
34	Tractors	hour	$ 11.83	0.28	$ 3.29	0.0%	$ -	$ 3.29
35	*DIESEL FUEL*							
36	Tractors	gal	$ 2.50	2.91	$ 7.28	0.0%	$ -	$ 7.28
37	Harvester	gal	$ 2.50	1.20	$ 3.01	0.0%	$ -	$ 3.01
38	*REPAIR & MAINTENANCE*							
39	Implements	acre	$ 4.12	1.00	$ 4.12	0.0%	$ -	$ 4.12
40	Tractors	acre	$ 1.78	1.00	$ 1.78	0.0%	$ -	$ 1.78
41	Harvester	acre	$ 3.12	1.00	$ 3.12	0.0%	$ -	$ 3.12
42	INTEREST ON OP. CAP.	acre	$ 3.01	1.00	$ 3.01	0.0%	$ -	$ 3.01
43	TOTAL DIRECT EXPENSES				$ 209.65		$ -	$ 209.65
44	RETURNS ABOVE DIRECT EXPENSES				$ 159.35		$73.80	$ 85.55
45								
46	FIXED EXPENSES							
47	Implements	acre	$ 8.15	1.00	$ 8.15	0.0%	$ -	$ 8.15
48	Tractors	acre	$ 10.87	1.00	$ 10.87	0.0%	$ -	$ 10.87
49	Harvester	acre	$ 11.95	1.00	$ 11.95	0.0%	$ -	$ 11.95
50	TOTAL FIXED EXPENSES				$ 30.97		$ -	$ 30.97
51	TOTAL SPECIFIED EXPENSES				$ 240.62		$ -	$ 240.62
52	RETURNS ABOVE TOTAL SPECIFIED EXPENSES				$ 128.38		$73.80	$ 54.58
53								

*Note: Cells containing **blue numbers** can be changed by the producer to reflect their share rent percentage, production situation, and price/yield expectations. Formulas used to calculate landlord and producers' (tenant) shares are embedded in the file.*

The wheat farm management tool also contains an area for sensitivity analysis on the potential net returns above direct costs (per acre) that may be obtained. This analysis presents the tenant's share of net returns over a range of price and yield combinations. The base parameters for price and yield, as entered in cells C7 and D7, provide the basis for the analysis (as highlighted in yellow). Figure 5. In this example, the net returns above direct production expense accrued to the grower under a 20% share rent is $85.55 per acre; assuming a $6.15 wheat price and a 60 bushel per acre yield. Prices are set to range ± $0.20 per bushel and yield is set to range ± 20 bushels per acre from the producer-specified parameters.

For an owner-operator, given a producer's direct production expenses of $209.65 per acre coupled with a wheat price of $6.15 per bushel; any yield above 34.1 bushels per acre would equate to a positive margin-less total specified expenses.

Figure 5. Estimated range of net returns above direct production expenses (dollars per acre) to the tenant grower from the Custom Wheat Enterprise Budget tool.

Returns Above Variable (Direct) Production Expenses to the Grower (with share rent)									
					Wheat Price				
Yield	$ 5.95	$ 6.00	$ 6.05	$ 6.10	**$ 6.15**	$ 6.20	$ 6.25	$ 6.30	$ 6.35
40.00	$ (19.25)	$ (17.65)	$ (16.05)	$ (14.45)	$ (12.85)	$ (11.25)	$ (9.65)	$ (8.05)	$ (6.45)
45.00	$ 4.55	$ 6.35	$ 8.15	$ 9.95	$ 11.75	$ 13.55	$ 15.35	$ 17.15	$ 18.95
50.00	$ 28.35	$ 30.35	$ 32.35	$ 34.35	$ 36.35	$ 38.35	$ 40.35	$ 42.35	$ 44.35
55.00	$ 52.15	$ 54.35	$ 56.55	$ 58.75	$ 60.95	$ 63.15	$ 65.35	$ 67.55	$ 69.75
60.00	$ 75.95	$ 78.35	$ 80.75	$ 83.15	**$ 85.55**	$ 87.95	$ 90.35	$ 92.75	$ 95.15
65.00	$ 99.75	$ 102.35	$ 104.95	$ 107.55	$ 110.15	$ 112.75	$ 115.35	$ 117.95	$ 120.55
70.00	$ 123.55	$ 126.35	$ 129.15	$ 131.95	$ 134.75	$ 137.55	$ 140.35	$ 143.15	$ 145.95
75.00	$ 147.35	$ 150.35	$ 153.35	$ 156.35	$ 159.35	$ 162.35	$ 165.35	$ 168.35	$ 171.35
80.00	$ 171.15	$ 174.35	$ 177.55	$ 180.75	$ 183.95	$ 187.15	$ 190.35	$ 193.55	$ 196.75

An additional worksheet ("LSU Wheat Budget blank fields") is provided in the Excel file to allow producers create their own farm-specific costs and returns model, if one is desired. The "LSU Wheat Budget" worksheet can also be edited.

Authors note: To download the farm management tool, right click on the Microsoft® Excel file icon and select the download option. Once the file is opened, please be sure to select the 'enable edit' message on the ribbon that appears on the top of the spreadsheet. Once the edit feature is enabled, changes can be made to the input parameters. Remember that only those cells containing **blue numbers** can be changed.

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Dr. Michael A. Deliberto can be contacted in the Department of Agricultural Economics and Agribusiness at (225) 578-7267 or by emailing mdeliberto@agcenter.lsu.edu.