

PROJECTED COSTS AND RETURNS FROM CENTIPEDE SOD PRODUCTION
IN LOUISIANA

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The authors express their appreciation to people who assisted in the completion of this work. B.Sc. Marco Velástegui served as technician for the budget generator and provided invaluable assistance in identifying problem areas. Machinery dealers provided cost and performance data, and offered insightful comment on production practices and other purchased inputs.

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INTRODUCTION

In 2004, 24 Louisiana turfgrass sod farms cultivated 4,125 acres of fine turf grasses. Gross farm sales were estimated at \$22,272,300. About 60% of the sod acreage in Louisiana is centipede grass. The remaining acreage is divided among St. Augustine, Bermudas and Zoysias, in that order. With strong construction demand due to hurricane recovery and the production of quality sod by Louisiana growers, producers received strong prices in 2005 and 2006. High shipping costs incurred by growers in other states help make local sod more competitive.

This report provides estimates of costs and returns associated with turfgrass sod production practices in Louisiana for 2006. It is part of a continuing effort to provide farmers, researchers, extension agents, lending agencies, and others with timely planning information. It is a starting point to evaluate cost of production and should be adjusted to fit specific farm situations. This is an individual enterprise budget, so no charges for farm overhead or family living expenses are included in this analysis.

Software to Calculate Budgets

Due to the detailed nature of cost computations, a computerized budget generator (Mississippi State Budget Generator, or MSBG, version 6.0) program was utilized. MSBG provides a standard format for crop and livestock budgets; its computational procedures are

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widely accepted; and the procedure can be updated easily for budgeting, or for considering alternative farm situations. The program specifies a system of computational procedures for calculating costs and returns.

These budgets provide cost estimates based on a set of assumptions about farm and machinery size, production practices, performance rates, and productive inputs used. Users of the budgets might find that their farm situation differs from these assumptions. Two ways to change the cost estimates are:

- pencil in differences in the 'your cost' column of the cost report, and adjust the totals accordingly

- use the budget generator to modify a budget. MSBG can be downloaded from the website of the Department of Agricultural Economics at Mississippi State University (<http://www.agecon.msstate.edu/laughlin/msbg.php>). Files required to run these budgets are available from the authors.

Data Files

Several data files, including powered equipment, implements, other durable equipment, and operating inputs, must be available to MSBG. The user specifies data required to prepare a budget, such as interest rates, performance rates and input prices. The responsibility for selection of appropriate data to calculate a budget rests with the user.

A conservative approach in decisions about values in the data files is appropriate. An example of this conservativeness is use of new machinery and equipment costs in budget development. Fixed costs are higher because interest charges and depreciation calculations are based on purchase price. Some growers may feel that their own costs are lower because they bought used machinery or are using older, depreciated machinery. These arguments are reasonable, but the assumption of new machinery probably is more valid for a planning situation.

Inputs such as fertilizers, insecticides, herbicides, harvest aides and other similar items are found in the 'operating inputs' file. Prices reflect quantities that would be appropriate to the commercial-sized production unit.

Choosing the Set of Production Activities

For a complete budget, the user must specify what activities occur, when they occur, the machinery or equipment used, and the operating inputs included. The budgets follow the calendar year. We use an approach often called 'economic engineering', based on the argument that a planning budget can be prepared with adequate precision through consultation with knowledgeable individuals and experts in the industry.

The budgets presented here were prepared based on the knowledge base of LSU AgCenter Extension Horticulturalists. These experts specified the production activities (planting, application of crop protection products, timing of product application), performance rates for machinery and equipment, and yields. Based on these activities, budgets were prepared and were presented to selected growers to confirm the parameters used. The budgets presented in the following tables are a logical production system that could be used by producers of similar size and financial resources. In addition, many other combinations of activities, products and performance rates could be used to produce sod. These alternatives would result in somewhat different estimates of cost.

Once the basic budget has been created, it can be altered to represent other general situations or tailored to a specific farming operation.

Assumptions

The situation chosen for budgeting is an operation of about 100 acres. Growers are assumed to be landowners; they are experienced producers; and they follow Extension's recommended practices to a large extent.

Capital. We think that most sod growers use their own capital to fund investments and operating expenses. The budgets include a long term interest rate charge to represent the opportunity cost of capital. In addition, borrowing to fund startup or expansion of farm enterprises may be problematic, because many lenders may have little information about or experience with risks in sod production.

Labor. Growers (and family members) in this size range may expect to do most or all the production work. In a budget, each hour of labor required by the enterprise is charged. The rates used vary by skill requirements. Hours of management/owner labor are charged at \$15.30. All other hours of labor are charged at \$9.60 (based on scheduled increases in minimum wage and the insurance premiums for SSI and unemployment compensation).

Machinery. Choosing an appropriate machinery size is important for its impact on operating and overhead costs. We assume that these growers do not have other agricultural activities of significant size, so the sod acreage guides the machinery size choice. A tractor of about 50 hp, equipped with turf tires, is adequate for most management operations. A second tractor of at least 75 hp equipped with 38 inch rims and lug tires is included for heavy soil work and as a backup unit. Implements needed include a roller, sprayer unit, finishing mower unit, tractor-mounted harvester and center pivot irrigation. A sod aerifier may be used between crops to reduce soil compaction. In interviews, growers emphasized the advantages of larger machinery to allow timely completion of activities when bad weather shortens the opportunity to work, and getting activities completed faster as a way to contain labor costs.

Land. Access to land for sod production is an important consideration. This access can happen through ownership, lease, or other arrangement. There also is extensive variation in land value across the state. **For these reasons, a land cost for previously cropped land is not**

included in these budgets. A user of this information should determine an appropriate cost (lease, taxes, purchase, etc.) and reduce the net returns by that value.

Office and Administrative. **These costs are not included in the enterprise budget,** but a small office would be needed to serve the sod farm's various administrative and sales activities. We assume the grower handles these tasks. During the peak sales season (April through August), a part-time assistant may be needed to manage the office for duties such as taking calls, scheduling and book-keeping. Administrative costs would consist of wages for clerical and supervisory personnel, and replacement of non-depreciable items such as office supplies. Office and administrative costs could be lower if shared by other farm enterprises or related businesses.

Production Practices for Cost of Production Budgets

Planting

Typically, centipede production begins with seed drilled into a prepared seedbed. The harvest procedure leaves a 1.5 to 2 inch 'ribbon' of sod in the field to provide the basis for regrowth.

Irrigation

Irrigation is necessary to achieve consistent commercial sod production. The center pivot irrigation system is common on sod farms. The major components of the system are the well, gear head, diesel engine, and pipes. Costs were taken from enterprise budgets for Louisiana farm situations where center pivot irrigation is common. Costs included in the budget include the expense of digging the well, which can add substantially to the initial investment requirement. The budgets include application of 24 irrigation applications (acre inches) per year. The application pattern differs in the planting year to encourage rooting, and the pattern, amount and

cost of water applied will vary across years. Appendix Tables 5A and 5B provide detail of irrigation costs.

Weed Control

The choice of herbicides depends upon the specific noxious grasses and weeds present. Applications of these products at the recommended rate per acre and number of applications per year are intended to control weed problems. Inclusion of these brand-name products does not imply their endorsement by the LSU AgCenter.

Disease and Insect Control

Fungicides and insecticides for sod production are intended to protect against a typical set of pests and diseases. Inclusion of these brand-name products does not imply their endorsement by the LSU AgCenter.

Harvesting

The tractor-mounted harvester typically requires two workers in addition to the driver. A typical performance rate is 9 hours per acre. The cut sod is placed on a pallet in pattern that holds the load together during handling and transit.

Three tables are presented for each year:

- i) detailed cost per acre for field operations
- ii) summary by revenue and expense categories
- iii) cash flows

The Planting Year Budget

Table 1A shows the series of production activities along with activity and total cost estimates. In the first year, field work includes disking, leveling, preparation for planting, drilling seed, rolling and maintenance. Leveling is assumed to be done by custom operators on a

per cubic yard of soil moved basis. Based on information from farming areas in Louisiana where leveling is a common practice, we assume a leveling cost of \$200 per acre.

Major areas of costs are tractor cost, equipment cost, allocated labor, and operating inputs. Total cost with all required hours of labor charged is \$1413.90.

Table 1B is a summary statement of planting year expenses by expense category. For example, the cost of any chemical classified as an insecticide will be included in the general category of insecticides.

A significant number of labor hours is required. Labor is a non-cash expense item when work is performed and not paid directly, as is the case with either grower or unpaid family labor. In the budget, a labor expense is charged to all hours required in the sod enterprise. The labor charge is an opportunity cost because a resource (an hour of labor) used in sod production cannot be used for any other purpose, and should be expensed at the rate of the best alternative.

Multiple categories for labor are created to identify functions, as in the distinction between planting labor and mowing labor. The categories also denote skill levels, as between tractor driving and hand spraying. The budget includes depreciation, a noncash or fixed cost that is sometimes ignored until capital goods must be replaced.

Table 1A Estimated resource use and costs for field operations, per acre, Centipede Sod production, Planting Year, Louisiana, 2006.

OPERATION/ OPERATING INPUT	SIZE/ UNIT	POWER UNIT SIZE	PERF RATE	TIMES OVER	MTH	POWER UNIT COST		EQUIPMENT COST		ALLOC LABOR		OPERATING/DURABLE INPUT			TOTAL COST
						DIRECT	FIXED	DIRECT	FIXED	HOURS	COST	AMOUNT	PRICE	COST	
						-----dollars-----				dollars		-----dollars-----			
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	1.00	Feb	1.06	0.53	0.81	0.73	0.12	1.91				5.04
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	2.00	Mar	4.22	2.10	0.82	1.58	0.50	7.65				16.37
Glyphosate	gal											1.5000	20.00	30.00	30.00
Disk	4-Row	2WD 75 hp	0.140	4.00	Apr	7.00	2.75	1.00	2.02	0.56	8.63				21.40
Roller 32"	32"	2WD 75 hp	0.250	1.00	Apr	3.10	1.22	0.33	1.15	0.25	3.83				9.63
Land Level Custom	acre			1.00	Apr							1.0000	200.00	200.00	200.00
Fert App Custom	acre			1.00	Apr							1.0000	5.00	5.00	5.00
Fert 13-13-13	cwt											2.0000	15.50	31.00	31.00
Roller 32"	32"	2WD 75 hp	0.250	1.00	Apr	3.10	1.22	0.33	1.15	0.25	3.83				9.63
Grain Drill	12'	2WD 50hp	0.158	2.00	Apr	2.86	1.33	2.27	3.35	0.47	6.37				16.18
Centipede seeds	lb											12.0000	25.00	300.00	300.00
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	2.00	May	2.11	1.05	1.63	1.46	0.25	3.83				10.08
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	May	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Talstar	gal											0.3300	210.00	69.30	69.30
Fert App Custom	acre			1.00	Jun							1.0000	5.00	5.00	5.00
Amm Nitrate (34%)	cwt											1.0000	16.00	16.00	16.00
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	Jun	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Atrazine 4L	pt											4.0000	1.29	5.16	5.16
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	Jun	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Weedmaster	qt											1.0000	5.50	5.50	5.50
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	Jun	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Vantage	pt											2.2500	18.40	41.40	41.40
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	4.00	Jun	4.22	2.10	3.25	2.93	0.50	7.65				20.15
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	4.00	Jul	4.22	2.10	3.25	2.93	0.50	7.65				20.15
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	Jul	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Sedgehammer	oz											1.0000	77.00	77.00	77.00
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	Jul	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Vantage	pt											2.2500	18.40	41.40	41.40
Fert App Custom	acre			1.00	Aug							1.0000	5.00	5.00	5.00
Fert 13-13-13	cwt											2.0000	15.50	31.00	31.00
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	4.00	Aug	4.22	2.10	3.25	2.93	0.50	7.65				20.15
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	Aug	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Vantage	pt											2.2500	18.40	41.40	41.40
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	4.00	Sep	4.22	2.10	3.25	2.93	0.50	7.65				20.15
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	Oct	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Atrazine 4L	pt											4.0000	1.29	5.16	5.16
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	4.00	Oct	4.22	2.10	3.25	2.93	0.50	7.65				20.15
Irrigation	acre				Apr			94.35	58.44	4.39	42.21	1.0000			195.00
TOTALS						61.43	29.10	121.07	90.85	11.31	147.15			909.32	1358.92
INTEREST ON OPERATING CAPITAL															54.98
TOTAL SPECIFIED COST															1413.90

Notes: Brand names for crop protection chemicals are for budgeting purposes only, and do not constitute a brand recommendation by the LSU AgCenter.

Table 1B. Estimated costs and returns per acre, Centipede Sod production, Planting Year, Louisiana, 2006.

ITEM	UNIT	PRICE	QUANTITY	AMOUNT	YOUR FARM
		dollars		dollars	
DIRECT EXPENSES					
CUSTOM					
Land Level Custom	acre	200.00	1.0000	200.00	_____
Fert App Custom	acre	5.00	3.0000	15.00	_____
FERTILIZERS					
Fert 13-13-13	cwt	15.50	4.0000	62.00	_____
Amm Nitrate (34%)	cwt	16.00	1.0000	16.00	_____
HERBICIDES					
Glyphosate	gal	20.00	1.5000	30.00	_____
Atrazine 4L	pt	1.29	8.0000	10.32	_____
Weedmaster	qt	5.50	1.0000	5.50	_____
Vantage	pt	18.40	6.7500	124.20	_____
Sedgehammer	oz	77.00	1.0000	77.00	_____
INSECTICIDES					
Talstar	gal	210.00	0.3300	69.30	_____
SEEDS					
Centipede seeds	lb	25.00	12.0000	300.00	_____
Operator Labor					
Tractors	hour	15.30	6.7557	103.42	_____
Hired Labor					
Special Labor	hour	9.60	4.3988	42.21	_____
Implements	hour	9.60	0.1584	1.52	_____
DIESEL FUEL					
Tractors	gal	2.23	17.3723	38.71	_____
Irrigation	gal	2.23	35.8436	79.92	_____
REPAIR & MAINTENANCE					
Implements	acre	26.72	1.0000	26.72	_____
Tractors	acre	22.72	1.0000	22.72	_____
Irrigation	acre	14.43	1.0000	14.43	_____
INTEREST ON OP. CAP.	acre	54.98	1.0000	54.98	_____
TOTAL DIRECT EXPENSES				1293.95	_____
RETURNS ABOVE DIRECT EXPENSES				-1293.95	_____
FIXED EXPENSES					
Implements	acre	32.41	1.0000	32.41	_____
Tractors	acre	29.10	1.0000	29.10	_____
Irrigation	acre	58.44	1.0000	58.44	_____
TOTAL FIXED EXPENSES				119.95	_____
TOTAL SPECIFIED EXPENSES				1413.90	_____

Note: Brand names for crop protection chemicals are for budgeting purposes only, and do not constitute a brand recommendation by the LSU AgCenter.

Second Year Budget

In the second year, maintenance activities, irrigation and harvest are the dominant expenses. Harvest is incorporated into the budget as one distinct activity, but harvest occurs mostly from April to August as orders are received. Harvest expenses include the harvester and its associated labor, and a forklift suitable for use in the field. ***Budgeted costs start with preparation for planting and continue to the point where pallets of sod are loaded onto a truck. No transportation costs are included. In addition, marketing costs are not included even though these can be substantial commitments of time and resources.*** Estimated Total Specified Expenses (direct and fixed costs) for the second year are \$1858.59.

Revenue Pattern and Profit from Sod Production

The revenue stream that can be expected from a 100 acre sod farm that is beginning production activities is discussed below.

First and second years.

While there might be a small amount of product ready for sale in the planting year, we assume sales begin in the second year. Yards of sod available for sale is calculated as follows:

- Fields are not perfect - we allow for 10% loss due to weeds, ruts, and thin/bare areas.
- Harvest is not perfect – we allow for 3% cutting scraps
- This gives a 13% reduction from the theoretical maximum - some fields will be better, but some will be worse.
- At harvest, a 16 inch wide swath is cut and a 1.5 to 2 inch strip is left for regrowth. The strip left for regrowth reduces harvest by about 415 square yards
- The result is about 3850 square yards available for sale in the second year.

Table 2A Estimated resource use and costs for field operations, per acre, Centipede Sod Production, Year 2, Louisiana, 2006.

OPERATION/ OPERATING INPUT	SIZE/ UNIT	POWER UNIT SIZE	PERF RATE	TIMES OVER	MTH	POWER UNIT COST		EQUIPMENT COST		ALLOC LABOR		OPERATING/DURABLE INPUT			TOTAL COST
						DIRECT	FIXED	DIRECT	FIXED	HOURS	COST	AMOUNT	PRICE	COST	
						-----dollars-----				dollars		-----dollars-----			
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	Feb	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Atrazine 4L	pt											4.0000	1.29	5.16	5.16
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	2.00	Mar	2.11	1.05	1.63	1.46	0.25	3.83				10.08
Aerifier	10'	2WD 75 hp	0.172	1.00	Mar	2.14	0.84	0.66	0.99	0.17	2.64				7.27
Fert App Custom	acre			1.00	Mar							1.0000	5.00	5.00	5.00
Fert 13-13-13	cwt											2.0000	15.50	31.00	31.00
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	3.00	Apr	3.17	1.58	2.44	2.20	0.37	5.74				15.13
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	May	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Vantage	pt											2.2500	18.40	41.40	41.40
Fert App Custom	acre			1.00	May							1.0000	5.00	5.00	5.00
Amm Nitrate (34%)	cwt											1.0000	16.00	16.00	16.00
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	4.00	May	4.22	2.10	3.25	2.93	0.50	7.65				20.15
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	Jun	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Atrazine 4L	pt											4.0000	1.29	5.16	5.16
Roller 32"	32"	2WD 75 hp	0.250	1.00	Jun	3.10	1.22	0.33	1.15	0.25	3.83				9.63
Fert App Custom	acre			1.00	Jun							1.0000	5.00	5.00	5.00
Amm Nitrate (34%)	cwt											1.0000	16.00	16.00	16.00
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	4.00	Jun	4.22	2.10	3.25	2.93	0.50	7.65				20.15
Turfgrass harvester	50 hp		9.000	1.00	Jun	70.14	47.62			27.00	310.50				428.26
Pallets	each											77.0000	7.50	577.50	577.50
Fork Lift	35 HP		4.000	1.00	Jun	34.38	26.10			4.00	61.20				121.68
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	Jul	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Vantage	pt											2.2500	18.40	41.40	41.40
Fert App Custom	acre			1.00	Jul							1.0000	5.00	5.00	5.00
Amm Nitrate (34%)	cwt											1.0000	16.00	16.00	16.00
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	4.00	Jul	4.22	2.10	3.25	2.93	0.50	7.65				20.15
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	Aug	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Vantage	pt											2.2500	18.40	41.40	41.40
Fert App Custom	acre			1.00	Aug							1.0000	5.00	5.00	5.00
Fert 13-13-13	cwt											2.0000	15.50	31.00	31.00
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	4.00	Sep	4.22	2.10	3.25	2.93	0.50	7.65				20.15
Sprayer Turfgrass	20 ft	2WD 50hp	0.250	1.00	Oct	2.11	1.05	0.41	0.79	0.25	3.83				8.19
Atrazine 4L	pt											4.0000	1.29	5.16	5.16
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	4.00	Oct	4.22	2.10	3.25	2.93	0.50	7.65				20.15
Mower Rotary Finish	15.5 ft	2WD 50hp	0.125	1.00	Nov	1.06	0.53	0.81	0.73	0.12	1.91				5.04
Irrigation	acre				May			94.35	58.44	4.39	42.21	1.0000			195.00
TOTALS						149.86	95.74	118.93	84.36	40.57	493.09			852.18	1794.16
INTEREST ON OPERATING CAPITAL															64.43
TOTAL SPECIFIED COST															1858.59

Notes: Brand names for crop protection chemicals are for budgeting purposes only, and do not constitute a brand recommendation by the LSU AgCenter. Costs are accumulated to the point that pallets of sod are loaded onto a truck, but no transportation costs are included. In addition, marketing costs are explicitly excluded even though these can accumulate into substantial commitments of time and resources.

Table 2B. Estimated costs per acre, Centipede Sod production,
First Harvest Year, Louisiana, 2006.

ITEM	UNIT	PRICE	QUANTITY	AMOUNT	YOUR FARM
		dollars		dollars	
INCOME					
Sod	yard	1.35	3850.0000	5197.50	_____

TOTAL INCOME				5197.50	_____
DIRECT EXPENSES					
CUSTOM					
Fert App Custom	acre	5.00	5.0000	25.00	_____
HARVEST AID					
Pallets	each	7.50	77.0000	577.50	_____
FERTILIZERS					
Fert 13-13-13	cwt	15.50	4.0000	62.00	_____
Amm Nitrate (34%)	cwt	16.00	3.0000	48.00	_____
HERBICIDES					
Atrazine 4L	pt	1.29	12.0000	15.48	_____
Vantage	pt	18.40	6.7500	124.20	_____
Operator Labor					
Tractors	hour	15.30	5.1724	79.18	_____
Self-Propelled	hour	15.30	13.0000	198.90	_____
Hired Labor					
Special Labor	hour	9.60	4.3988	42.21	_____
Self-Propelled	hour	9.60	18.0000	172.80	_____
DIESEL FUEL					
Tractors	gal	2.23	12.6328	28.15	_____
Self-Propelled	gal	2.23	24.0000	53.52	_____
Irrigation	gal	2.23	35.8436	79.92	_____
REPAIR & MAINTENANCE					
Implements	acre	24.58	1.0000	24.58	_____
Tractors	acre	17.19	1.0000	17.19	_____
Self-Propelled	acre	51.00	1.0000	51.00	_____
Irrigation	acre	14.43	1.0000	14.43	_____
INTEREST ON OP. CAP.	acre	64.43	1.0000	64.43	_____

TOTAL DIRECT EXPENSES				1678.49	_____
RETURNS ABOVE DIRECT EXPENSES				3519.01	_____
FIXED EXPENSES					
Implements	acre	25.92	1.0000	25.92	_____
Tractors	acre	22.02	1.0000	22.02	_____
Self-Propelled	acre	73.72	1.0000	73.72	_____
Irrigation	acre	58.44	1.0000	58.44	_____

TOTAL FIXED EXPENSES				180.10	_____

TOTAL SPECIFIED EXPENSES				1858.59	_____
RETURNS ABOVE TOTAL SPECIFIED EXPENSES, 2nd YEAR				3338.91	_____

Notes: Brand names for crop protection chemicals are for budgeting purposes only, and do not constitute a brand recommendation by the LSU AgCenter.

The selling price is \$1.35 per yard. Since 2 years are required to get this output, costs for the planting year and the first harvest year are summed and included in the net return calculation (Table 3). Returns above Total Specified Expenses are estimated to be \$1925.01.

Table 3. Effects of Yield and Price Changes on Net Returns per Acre above Total Specified Expenses for Planting and First Harvest Year, Centipede Sod, Louisiana, 2006.

Yield (Square Yard)	-----Price Per Square Yard-----				
	\$1.15	\$1.25	\$1.35	\$1.45	\$1.55
	-----Net Returns Per Acre-----				
3250.00	510.01	835.01	1160.01	1485.01	1810.01
3550.00	832.51	1187.51	1542.51	1897.51	2252.51
3850.00	1155.01	1540.01	1925.01	2310.01	2695.01
4150.00	1477.51	1892.51	2307.51	2722.51	3137.51
4450.00	1800.01	2245.01	2690.01	3135.01	3580.01

As an indicator of the impact of possible changes in prices and yields on profit, net returns are calculated over a representative range of prices and yields. The ranges selected for prices and for yields are not intended to cover the entire range of possible levels.

The base price in Table 3, \$1.35 per square yard, is lower than market prices in 2006, reflecting the impacts of the 2004 and 2005 hurricanes in Louisiana and Florida. Significant renovation and restoration of landscapes in those areas support higher current prices. This situation might continue for some time. On the other hand, other unforeseen events might counter the hurricane damage, and drive price below our base level. Because of these considerations, we have chosen to base these planning budgets on conservative price estimates.

Third and subsequent years.

This level of production or higher is obtainable in the second year, but could be higher than a grower would average over several years. Expected production in following years is affected by several factors. The production cycle is assumed to average 14 months between

harvests of the same acre. Sod is harvested as sales are made, which occur mostly from April through August. An acre harvested in April could be sold again in the following year, but an acre harvested in September probably could not. This cycle of growth reduces potential sales in the 3rd and subsequent years. In addition, farmers want inventory available every year to maintain their customer base. Failing to have sod available could result in loss of customers. If every available acre of sod is harvested in a year, this 'out of stock' situation could occur. To compensate, many sod growers follow rules of thumb that may limit sales in any given year to some specified portion of total acreage.

Regardless of the grower's plans for sales, all acres of sod on the farm are maintained essentially the same from year to year. Thus, the budget for year 2 can be used for future years if we simply reduce the harvest activity costs and revenue by an amount based on the percentage to be harvested annually. This procedure provided the costs used in the net returns calculations in Table 4. Suppose the grower chooses to cut no more than 67% of his 100 acres. Yield for the budget would be $3850 \text{ yards} \times 0.67 = \text{about } 2600 \text{ yards}$. Harvest cost would be reduced to 67% of the full acre cost, so total specified costs declines to \$1472.33. Revenue per acre would be $\$1.35 \times 2600 \text{ yards}$, and subtracting costs from that revenue provides the estimate of \$2037.67 net returns per acre for the 3rd year. This estimate should apply to subsequent years.

Table 4. Effects of Yield and Price Changes on Net Returns per Acre above Total Specified Expenses, Third Harvest Year, 67% of Total Acres, Centipede Sod, Louisiana, 2006.

Yield (Square Yard)	-----Price Per Square Yard-----				
	\$1.15	\$1.25	\$1.35	\$1.45	\$1.55
	-----Net Returns Per Acre, dollars-----				
2000.00	872.67	1072.67	1272.67	1472.67	1672.67
2300.00	1195.17	1425.17	1655.17	1885.17	2115.17
2600.00	1517.67	1777.67	2037.67	2297.67	2557.67
2900.00	1840.17	2130.17	2420.17	2710.17	3000.17
3200.00	2162.67	2482.67	2802.67	3122.67	3442.67

Finally, cash flow tables indicate cash requirements by month over these years (Tables 5 and 6).

Table 5. Estimated monthly income and expense flows per acre Centipede Sod production, Planting Year, Louisiana, 2006.

ITEM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
-----dollars-----												
TOTAL INCOME	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DIRECT EXPENSES												
CUSTOM	0.00	0.00	0.00	205.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00
FERTILIZERS	0.00	0.00	0.00	31.00	0.00	16.00	0.00	31.00	0.00	0.00	0.00	0.00
HERBICIDES	0.00	0.00	30.00	0.00	0.00	52.06	118.40	41.40	0.00	5.16	0.00	0.00
INSECTICIDES	0.00	0.00	0.00	0.00	69.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SEEDS	0.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LABOR	0.00	1.91	7.65	28.69	13.58	25.51	21.68	17.85	14.02	16.26	0.00	0.00
LEASE *	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FUEL	0.00	0.65	2.58	17.63	12.57	19.77	18.48	17.19	15.90	13.86	0.00	0.00
REPAIR & MAINTENANCE	0.00	1.22	2.46	9.25	15.70	9.04	7.81	6.58	5.35	6.46	0.00	0.00
INTEREST ON OP. CAP.	0.00	0.24	2.49	31.05	5.17	5.19	5.82	3.48	0.82	0.72	0.00	0.00
TOTAL DIRECT EXPENSES	0.00	4.02	45.18	622.62	116.32	132.57	172.19	122.50	36.09	42.46	0.00	0.00
NET INCOME	0.00	-4.02	-45.18	-622.62	-116.32	-132.57	-172.19	-122.50	-36.09	-42.46	0.00	0.00
NET INCOME TO DATE	0.00	-4.02	-49.20	-671.82	-788.14	-920.71	-1092.90	-1215.40	-1251.49	-1293.95	-1293.95	-1293.95

Note: Lease costs are based on hourly usage costs.

Table 6. Estimated monthly income and expense flows per acre Centipede Sod Production, Year 2 Louisiana, 2006

ITEM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
-----dollars-----												
TOTAL INCOME	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DIRECT EXPENSES												
CUSTOM	0.00	0.00	0.00	205.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00
FERTILIZERS	0.00	0.00	0.00	31.00	0.00	16.00	0.00	31.00	0.00	0.00	0.00	0.00
HERBICIDES	0.00	0.00	30.00	0.00	0.00	52.06	118.40	41.40	0.00	5.16	0.00	0.00
INSECTICIDES	0.00	0.00	0.00	0.00	69.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SEEDS	0.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LABOR	0.00	1.91	7.65	28.69	13.58	25.51	21.68	17.85	14.02	16.26	0.00	0.00
LEASE *	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FUEL	0.00	0.65	2.58	17.63	12.57	19.77	18.48	17.19	15.90	13.86	0.00	0.00
REPAIR & MAINTENANCE	0.00	1.22	2.46	9.25	15.70	9.04	7.81	6.58	5.35	6.46	0.00	0.00
INTEREST ON OP. CAP.	0.00	0.24	2.49	31.05	5.17	5.19	5.82	3.48	0.82	0.72	0.00	0.00
TOTAL DIRECT EXPENSES	0.00	4.02	45.18	622.62	116.32	132.57	172.19	122.50	36.09	42.46	0.00	0.00
NET INCOME	0.00	-4.02	-45.18	-622.62	-116.32	-132.57	-172.19	-122.50	-36.09	-42.46	0.00	0.00
NET INCOME TO DATE	0.00	-4.02	-49.20	-671.82	-788.14	-920.71	-1092.90	-1215.40	-1251.49	-1293.95	-1293.95	-1293.95

Note: Lease costs are based on hourly usage costs.

Appendix Tables.

Appendix Table 1. Powered Equipment: estimated useful life, annual use, purchase price, repair cost, fuel consumption rate, and direct and fixed cost per hour Louisiana, 2006.

Item Name	Size	Purchase Price	Annual Use	Useful Life	Fuel Use	Labor	Fuel	R&M	Total Direct	Fixed	Total Cost
		dollars	hours	years	gal/hr	-----\$/hour-----					
Tractor (60-89HP)sod	2WD 75 hp	30,557	800	10	3.86	15.30	8.60	3.81	27.72	4.88	32.61
Tractor (40-59hp)sod	2WD 50hp	26,306	800	10	2.57	15.30	5.73	3.28	24.32	4.20	28.53
Fork Lift	35 HP	21,000	400	10	1.50	61.20	13.38	21.00	95.58	26.09	121.67
Turfgrass harvester	50 hp	45,000	900	15	2.00	310.50	40.14	30.00	380.64	47.61	428.25

Labor includes allocated labor from power unit. Total Direct does not include interest on operating capital.

Appendix Table 2. Implements: estimated performance rate, useful life, annual use, purchase price, repair cost, and direct and fixed cost per hour and per acre Louisiana, 2006.

Item Name	Size	Power Unit	Purchase Price	Annual Use	Useful Life	Perf Rate	Labor	Fuel	---R&M---	Total Imp. P.U. Direct	--Fixed-- Imp. P.U.	Total Cost		
			dollars	hours	years	hr/ac	-----\$/acre-----							
Aerifier	10'	2WD 75 hp	8,500	200	10	0.172	2.63	1.48	0.65	0.65	5.44	0.99	0.84	7.27
Disk	4-Row	2WD 75 hp	4,743	160	10	0.140	2.15	1.21	0.25	0.52	4.14	0.50	0.67	5.32
Grain Drill	12'	2WD 75 hp	11,487	150	8	0.158	3.18	1.36	1.13	0.59	6.27	1.67	0.75	8.70
Mower Rotary Finish	15.5 ft	2WD 50hp	13,000	300	10	0.125	1.91	0.71	0.81	0.41	3.85	0.73	0.52	5.11
Roller 32"	32"	2WD 50hp	4,000	100	12	0.250	3.82	1.43	0.33	0.82	6.41	1.14	1.05	8.61
Sprayer Turfgrass	20 ft	2WD 50hp	3,500	150	10	0.250	3.82	1.43	0.40	0.82	6.49	0.78	1.05	8.32

Notes: Labor: Includes labor from Power unit plus additional labor from the implement.
Total Direct: Does not include interest on operating capital.

Appendix Table 3. Operating inputs: estimated prices Louisiana, 2006.

ITEM NAME	UNIT	PRICE	UNIT	PRICE	
		dollars	dollars		
CUSTOM					
Fert App Custom	acre	5.00	Land Level Custom	acre	200.00
FERTILIZERS					
Amm Nitrate (34%)	cwt	16.00	Fert 13-13-13	cwt	15.50
HERBICIDES					
Weedmaster	qt	5.50	Atrazine 4L	pt	1.29
Glyphosate	gal	20.00	Sedgehammer	oz	77.00
Vantage	pt	18.40			
SEEDS			INSECTICIDES		
Centipede seeds	lb	25.00	Talstar	gal	210.00

Appendix Table 4. Single durable inputs: estimated purchase price, annual use, useful life, fuel consumption rate, labor, fuel, R&M, total direct, fixed and total cost per year, Louisiana, 2006

Item Name	Unit of Measure	Purchase Price	Annual Use	Useful Life	Fuel Use	Operation Time	Labor	Fuel	R&M	Total Direct	Fixed	Total Cost
		dollars	hours	years	gal/hr	units/hr	\$/yr	\$/yr	\$/yr	\$/yr	\$/yr	\$/yr
Engine, ¼ CP, 65	ac-in	7,000	2300	20	3.30	0.4525	0.00	0.00	262.50	262.50	660.75	923.25
Pivot ¼ CP	1320'	44,000	0	20	0.00	0.0000	0.00	0.00	880.00	880.00	4153.28	5033.28
Well & Pump, ¼ CP	each	12,000	0	25	0.00	0.0000	0.00	0.00	288.00	288.00	1029.72	1317.72

Notes: Labor: Includes allocated labor from the durable input.
Total Direct: Does not include interest on operating capital.

Appendix Table 5A. Estimated costs for field operations, per acre Center pivot irrigation system, 1/4 mile applying 24 inches in twenty four applications, Louisiana, 2006.

OPERATION/ OPERATING INPUT	SIZE/ UNIT	-----DIRECT COST-----						FIXED COST	TOTAL COST	
		OP INPUT	FUEL	R&M	LABOR	LEASE	INTER			
-----dollars-----										
Setup Engine										
Hired Labor	hour				2.84		0.15	2.99	2.99	
Apply Water										
Hired Labor	hour				3.19		0.17	3.36	3.36	
Apply Water										
Hired Labor	hour				4.78		0.22	5.00	5.00	
Maintenance										
Hired Labor	hour				1.14		0.05	1.19	1.19	
Apply Water										
Hired Labor	hour				6.37		0.26	6.63	6.63	
Apply Water										
Hired Labor	hour				6.37		0.22	6.59	6.59	
Apply Water										
Hired Labor	hour				6.37		0.19	6.56	6.56	
Apply Water										
Hired Labor	hour				6.37		0.15	6.52	6.52	
Apply Water										
Hired Labor	hour				4.78		0.08	4.86	4.86	
Pivot ¼ CP	each			8.80			0.41	9.21	41.53	
Well & Pump, ¼ CP	each			2.88			0.13	3.01	10.30	
Engine, ¼ CP, 65	each								6.61	
Application 1	ac-in		6.66	0.23			0.36	7.25	7.25	
Application 2	ac-in		9.99	0.34			0.48	10.81	10.81	
Application 3	ac-in		13.32	0.46			0.56	14.34	14.34	
Application 4	ac-in		13.32	0.46			0.48	14.26	14.26	
Application 5	ac-in		13.32	0.46			0.40	14.18	14.18	
Application 6	ac-in		13.32	0.46			0.32	14.10	14.10	
Application 7	ac-in		9.99	0.34			0.18	10.51	10.51	
TOTALS		0.00	79.92	14.43	42.21	0.00	4.81	141.37	58.44	199.81

Appendix Table 5B. Estimated costs and returns per acre
Center pivot irrigation system, 1/4 mile applying
24 inches in twenty four applications, Louisiana, 2006.

ITEM	UNIT	PRICE	QUANTITY	AMOUNT	YOUR FARM
		dollars		dollars	
DIRECT EXPENSES					
Hired Labor					
Special Labor	hour	9.60	4.3988	42.21	_____
DIESEL FUEL					
Engine, ¼ CP, 65	gal	2.23	35.8436	79.92	_____
REPAIR & MAINTENANCE					
Well & Pump, ¼ CP	each	288.00	0.0100	2.88	_____
Pivot ¼ CP	1320'	880.00	0.0100	8.80	_____
Engine, ¼ CP, 65	ac-in	0.11	24.0000	2.75	_____
INTEREST ON OP. CAP.	acre	4.81	1.0000	4.81	_____

TOTAL DIRECT EXPENSES				141.37	_____
RETURNS ABOVE DIRECT EXPENSES				-141.37	_____
FIXED EXPENSES					
Well & Pump, ¼ CP	each	1029.72	0.0100	10.30	_____
Pivot ¼ CP	each	4153.28	0.0100	41.53	_____
Engine, ¼ CP, 65	each	660.75	0.0100	6.61	_____

TOTAL FIXED EXPENSES				58.44	_____

TOTAL SPECIFIED EXPENSES				199.81	_____
RETURNS ABOVE TOTAL SPECIFIED EXPENSES				-199.81	_____