

Guideline Switchgrass Establishment And Annual Production Budgets Over Three, Six and Ten Year Planning Horizons

October 10, 2007

These guideline switchgrass budgets do not take into consideration potential production incentive funds from the Biofuels Initiative.

E12-4115-00-001-07

SWITCHGRASS PLANNING BUDGETS

TRADE NAMES AND PESTICIDE CAUTION

Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others which may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product.

Pesticides recommended in the publication were registered for the prescribed uses when this manual was printed. Pesticide registrations are continuously being reviewed. Should registration of a recommended pesticide be canceled, it will no longer be recommended by The University of Tennessee.

In order to protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide.

According to laws regulating pesticides, they must be used only as directed by the label.

**THESE PRODUCTS ARE INTENDED AS A GUIDE ONLY.
ADJUSTMENTS CAN BE AND SHOULD BE MADE WHEN NEEDED.**

Each farm has a unique set of resources. Guideline budgets should be adjusted for each farm in terms of projected yields and costs.

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Table 1

**SWITCHGRASS NO-TILLAGE ESTABLISHMENT: 3, 6 AND 10 YEAR PLANNING HORIZON
ESTIMATED EXPENSES PER ACRE**

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>PRICE</u>	<u>AMOUNT</u>	<u>YOUR FARM</u>
REVENUE						
SWITCHGRASS	BIOMASS	TON	0	0	\$0.00	_____
VARIABLE EXPENSES (1)						
SEED (2)	PLS (PURE LIVE SEED)	LB.	6	\$20.00	\$120.00	_____
FERTILIZER (3) (4)	P2O5	LB.	40	\$0.32	\$12.80	_____
	K2O	LB.	80	\$0.22	\$17.60	_____
WEED CONTROL (5)						
FALL BURNDOWN	ROUNDUP ORIGINAL MAX	PT.	1.6	\$2.24	\$3.58	_____
SPRING BURNDOWN	ROUNDUP ORIGINAL MAX	PT.	1.6	\$2.24	\$3.58	_____
POST-EMERGE	CIMARRON	OZ.	0.1	\$19.00	\$1.90	_____
POST-EMERGE	GRASS HERBICIDE	ACRE	1	\$7.00	\$7.00	_____
POST-EMERGE	GRASS HERBICIDE	ACRE	1	\$7.00	\$7.00	_____
POST-EMERGE	GRASS HERBICIDE	ACRE	1	\$7.00	\$7.00	_____
MACHINERY REPAIR		AC.	1	\$6.80	\$6.80	_____
MACHINERY FUEL	DIESEL @ \$2.10/GALLON	AC.	1	\$8.76	\$8.76	_____
OPERATING CAPITAL	6 MONTHS	AC.	\$196.03	8.00%	\$7.84	_____
				TOTAL VARIABLE EXPENSES	\$203.87	_____
MACHINERY EXPENSES						
MACHINERY DEPRECIATION		AC.	1	\$7.92	\$7.92	_____
INTEREST EXPENSE	MACHINERY & EQUIP.	AC.	1	\$5.17	\$5.17	_____
				MACHINERY COST	\$13.09	_____
LABOR EXPENSES						
LABOR		HR.	0.62	\$8.50	\$5.29	_____
				LABOR COST	\$5.29	_____
TOTAL ESTABLISHMENT COST					\$222.25	_____
ESTABLISHMENT COST PRORATED OVER 3 YEARS		ANNUAL	\$222.25	8.00%	\$86.24	_____

FOOTNOTES

- (1) SWITCHGRASS ESTABLISHED USING SPRING SEEDING WITH A NO-TILL DRILL.
- (2) THERE IS A WIDE RANGE IN SEED PRICES. THE RECOMMENDED SEEDING RATE IS 8 POUNDS OF PURE LIVE SEED PER ACRE.
- (3) ASSUMES A SOIL TEST LOW IN P&K. **IF SOIL TEST VALUES ARE MEDIUM OR HIGH IN P&K, NO P2O5 OR K2O IS RECOMMENDED.** COST OF RENTING SPREADER IS INCLUDED IN THE FERTILIZER PRICE.
- (4) LIME IS NOT RECOMMENDED IF THE SOIL PH IS 5.0 OR ABOVE.
- (5) APPROPRIATE WEED CONTROL MEASURES VARY GREATLY ACCORDING TO PREVIOUS CROPPING HISTORY AND SPECIFIC WEED VARIETIES. CAREFULLY EVALUATE FIELDS AND ADJUST THE BUDGET ACCORDINGLY.

Establishment cost prorated over six years \$48.08

Establishment cost prorated over ten years \$33.12

Table 2

**SWITCHGRASS NO-TILLAGE ESTABLISHMENT: 3, 6 AND 10 YEAR PLANNING HORIZON
ESTIMATED LABOR, POWER AND MACHINERY INPUTS**

MONTH	OPERATION	EQUIPMENT	HOURS PER ACRE	
			MACHINE	LABOR
AUGUST	BURNDOWN/PRE-EMERGE	Sprayer, 60' boom	0.03	0.03
SEPTEMBER	BURNDOWN/PRE-EMERGE	Sprayer, 60' boom	0.03	0.03
MAY	PLANT	No-till drill, 16 row @ 7.5" spacing	0.24	0.29
	BURNDOWN/PRE-EMERGE	Sprayer, 60' boom	0.03	0.03
	BURNDOWN/PRE-EMERGE	Sprayer, 60' boom	0.03	0.03
	SPREAD FERTILIZER	Tractor, 150H.P.,W/Cab, Air	0.07	0.08
	POST-EMERGE SPRAY(3X)	Sprayer, 60' boom	0.08	<u>0.10</u>
		TOTAL		0.62

MACHINE	HOURS	----INTEREST COST----		---COST PER HOUR---		-----COST PER ACRE-----			
	PER ACRE	PER HOUR	PER ACRE	F.C.	V.C.	FIXED	REPAIR	FUEL	VAR
Tractor, 150 HP	0.50	\$5.84	\$2.91	\$8.21	\$25.69	\$4.09	\$4.04	\$8.76	\$12.79
No-till Drill	0.24	\$6.80	\$1.60	\$11.49	\$8.50	\$2.71	\$2.00	\$0.00	\$2.00
Sprayer, 60' boom	0.20	\$3.36	\$0.66	\$5.78	\$3.92	\$1.13	\$0.77	\$0.00	\$0.77
TOTAL			\$5.17			\$7.92	\$6.80	\$8.76	\$15.56

--- PLEASE NOTE: TOTALS MAY BE DIFFERENT DUE TO ROUNDING. ---

Table 3

**SWITCHGRASS NO-TILLAGE RESEEDING: YEAR 2 OF 3, 6 AND 10 YEAR PLANNING HORIZON
ESTIMATED EXPENSES PER ACRE**

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>PRICE</u>	<u>AMOUNT</u>	<u>YOUR FARM</u>
REVENUE						
SWITCHGRASS	BIOMASS	TON	0	0	\$0.00	_____
VARIABLE EXPENSES (1)						
SEED (2)	PLS (PURE LIVE SEED)	LB.	6	\$20.00	\$120.00	_____
FERTILIZER (3) (4)	P2O5	LB.	40	\$0.32	\$12.80	_____
	K2O	LB.	80	\$0.22	\$17.60	_____
WEED CONTROL						
FALL BURNDOWN	ROUNDUP ORIGINAL MAX	PT.	1.6	\$2.24	\$3.58	_____
SPRING BURNDOWN	ROUNDUP ORIGINAL MAX	PT.	1.6	\$2.24	\$3.58	_____
POST-EMERGE	CIMARRON	OZ.	0.1	\$19.00	\$1.90	_____
POST-EMERGE	GRASS HERBICIDE	ACRE	1	\$7.00	\$7.00	_____
POST-EMERGE	GRASS HERBICIDE	ACRE	1	\$7.00	\$7.00	_____
POST-EMERGE	GRASS HERBICIDE	ACRE	1	\$7.00	\$7.00	_____
MACHINERY REPAIR		AC.	1	\$6.26	\$6.26	_____
MACHINERY FUEL	DIESEL @ \$2.10/GALLON	AC.	1	\$7.58	\$7.58	_____
OPERATING CAPITAL	6 MONTHS	AC.	\$194.31	8.00%	\$7.77	_____
					TOTAL VARIABLE EXPENSES	\$202.08 _____
MACHINERY EXPENSES						
MACHINERY DEPRECIATION		AC.	1	\$7.37	\$7.37	_____
INTEREST EXPENSE	MACHINERY & EQUIP.	AC.	1	\$4.78	\$4.78	_____
					MACHINERY COST	\$12.15 _____
LABOR EXPENSES						
LABOR		HR.	0.54	\$8.50	\$4.58	_____
					LABOR COST	\$4.58 _____
TOTAL ESTABLISHMENT COST					\$218.81	_____
RESEEDING COST PRORATED OVER 2 YEARS		ANNUAL	\$43.76	8.00%	\$24.54	_____

FOOTNOTES

- (1) SWITCHGRASS ESTABLISHED USING SPRING SEEDING WITH A NO-TILL DRILL. THE PROBABILITY OF RESEEDING SPRING SEEDED SWITCHGRASS IS ESTIMATED TO BE 20%.
- (2) THERE IS A WIDE RANGE IN SEED PRICES. THE RECOMMENDED SEEDING RATE IS 8 POUNDS OF PURE LIVE SEED PER ACRE.
- (3) ASSUMES A SOIL TEST LOW IN P&K. **IF SOIL TEST VALUES ARE MEDIUM OR HIGH IN P&K, NO P2O5 OR K2O IS RECOMMENDED.** COST OF RENTING SPREADER IS INCLUDED IN THE FERTILIZER PRICE. RESEEDING ASSUMES NO HARVEST OF SWITCHGRASS AND NO LOSS OF SOIL NUTRIENTS. THEREFORE NO P2O5 OR K2O APPLICATIONS ARE NECESSARY.
- (4) LIME IS NOT RECOMMENDED IF THE SOIL PH IS 5.0 OR ABOVE.

Reseeding prorated over five years \$10.96

Reseeding prorated over nine years \$7.01

Table 4

**SWITCHGRASS NO-TILLAGE RESEEDING: YEAR 2 OF 3, 6 AND 10 YEAR PLANNING HORIZON
ESTIMATED LABOR, POWER AND MACHINERY INPUTS**

MONTH	OPERATION	EQUIPMENT	HOURS PER ACRE	
			MACHINE	LABOR
AUGUST	BURNDOWN/PRE-EMERGE	Sprayer, 60' boom	0.03	0.03
SEPTEMBER	BURNDOWN/PRE-EMERGE	Sprayer, 60' boom	0.03	0.03
MAY	PLANT	No-till drill, 16 row @ 7.5" spacing	0.24	0.29
	BURNDOWN/PRE-EMERGE	Sprayer, 60' boom	0.03	0.03
	BURNDOWN/PRE-EMERGE	Sprayer, 60' boom	0.03	0.03
	POST-EMERGE SPRAY (3X)	Sprayer, 60' boom	0.08	<u>0.10</u>
			TOTAL	0.54

MACHINE	HOURS PER ACRE	----INTEREST COST----		---COST PER HOUR---		-----COST PER ACRE-----			
		PER HOUR	PER ACRE	F.C.	V.C.	FIXED	REPAIR	FUEL	VAR
Tractor, 150 HP	0.43	\$5.84	\$2.52	\$8.21	\$25.69	\$3.54	\$3.49	\$7.58	\$11.07
No-till Drill	0.24	\$6.80	\$1.60	\$11.49	\$8.50	\$2.71	\$2.00	\$0.00	\$2.00
Sprayer, 60' boom	0.20	\$3.36	\$0.66	\$5.78	\$3.92	\$1.13	\$0.77	\$0.00	\$0.77
TOTAL			\$4.78			\$7.37	\$6.26	\$7.58	\$13.84

--- PLEASE NOTE: TOTALS MAY BE DIFFERENT DUE TO ROUNDING. ---

Table 5

**SWITCHGRASS ANNUAL PRODUCTION BUDGET: 3 YEAR PLANNING HORIZON
ESTIMATED EXPENSES PER ACRE**

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>PRICE</u>	<u>AMOUNT</u>	<u>YOUR FARM</u>
REVENUE						
SWITCHGRASS	BIOMASS	TON	0	0	\$0.00	_____
VARIABLE EXPENSES						
FERTILIZER (1) (2)	NITROGEN	LB.	60	\$0.42	\$25.20	_____
	P2O5	LB.	40	\$0.32	\$12.80	_____
	K2O	LB.	80	\$0.22	\$17.60	_____
TRIPLE TIE	TWINE, 1500 LB. BALE	BALE	5.9	\$1.19	\$7.02	_____
WEED CONTROL						
POST-EMERGE	CIMARRON	OZ.	0.1	\$19.00	\$1.90	_____
POST-EMERGE	GRASS HERBICIDE	ACRE	1	\$7.00	\$7.00	_____
MACHINERY REPAIR		AC.	1	\$30.29	\$30.29	_____
MACHINERY FUEL	DIESEL @ \$2.10/GALLON	AC.	1	\$35.26	\$35.26	_____
OPERATING CAPITAL	6 MONTHS	AC.	\$137.07	8.00%	\$5.48	_____
					TOTAL VARIABLE EXPENSES	\$142.55 _____
MACHINERY EXPENSES						
MACHINERY DEPRECIATION		AC.	1	\$33.99	\$33.99	_____
INTEREST EXPENSE	MACHINERY & EQUIP.	AC.	1	\$17.96	\$17.96	_____
				MACHINERY COST	\$51.94	_____
LABOR EXPENSES						
LABOR		HR.	2.51	\$8.50	\$21.30	_____
				LABOR COST	\$21.30	_____
PRORATED ESTABLISHMENT COST (3)					\$86.24	_____
PRORATED RESEEDING COST (4)					\$24.54	_____
PRODUCTION COST, EXCLUDING LAND AND MANAGEMENT CHARGES					\$326.58	_____

FOOTNOTES

- (1) ASSUMES A SOIL TEST LOW IN P&K. **IF SOIL TEST VALUES ARE MEDIUM OR HIGH IN P&K, NO P2O5 OR K2O IS RECOMMENDED.** COST OF RENTING SPREADER IS INCLUDED IN THE FERTILIZER PRICE.
- (2) LIME IS NOT RECOMMENDED IF THE SOIL PH IS 5.0 OR ABOVE.
- (3) SEE SWITCHGRASS ESTABLISHMENT BUDGET.
- (4) SEE SWITCHGRASS RESEEDING BUDGET.

Table 7

SWITCHGRASS ANNUAL PRODUCTION BUDGET: 6 YEAR PLANNING HORIZON
ESTIMATED EXPENSES PER ACRE

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>PRICE</u>	<u>AMOUNT</u>	<u>YOUR FARM</u>
REVENUE						
SWITCHGRASS	BIOMASS	TON	0	0	\$0.00	_____
VARIABLE EXPENSES						
FERTILIZER (1) (2)	NITROGEN	LB.	60	\$0.42	\$25.20	_____
	P2O5	LB.	40	\$0.32	\$12.80	_____
	K2O	LB.	80	\$0.22	\$17.60	_____
TRIPLE TIE	TWINE, 1500 LB. BALE	BALE	7.8	\$1.19	\$9.28	_____
WEED CONTROL						
POST-EMERGE	CIMARRON	OZ.	0.1	\$19.00	\$1.90	_____
POST-EMERGE	GRASS HERBICIDE	ACRE	1	\$7.00	\$7.00	_____
MACHINERY REPAIR		AC.	1	\$42.66	\$42.66	_____
MACHINERY FUEL	DIESEL @ \$2.10/GALLON	AC.	1	\$48.97	\$48.97	_____
OPERATING CAPITAL	6 MONTHS	AC.	\$165.42	8.00%	\$6.62	_____
					TOTAL VARIABLE EXPENSES	\$172.04 _____
MACHINERY EXPENSES						
MACHINERY DEPRECIATION		AC.	1	\$47.61	\$47.61	_____
INTEREST EXPENSE	MACHINERY & EQUIP.	AC.	1	\$25.04	\$25.04	_____
					MACHINERY COST	\$72.65 _____
LABOR EXPENSES						
LABOR		HR.	3.48	\$8.50	\$29.59	_____
					LABOR COST	\$29.59 _____
PRORATED ESTABLISHMENT COST (3)					\$48.08	_____
PRORATED RESEEDING COST (4)					\$10.96	_____
PRODUCTION COST, EXCLUDING LAND AND MANAGEMENT CHARGES					\$333.31	_____

FOOTNOTES

- (1) ASSUMES A SOIL TEST LOW IN P&K. **IF SOIL TEST VALUES ARE MEDIUM OR HIGH IN P&K, NO P2O5 OR K2O IS RECOMMENDED.** COST OF RENTING SPREADER IS INCLUDED IN THE FERTILIZER PRICE.
- (2) LIME IS NOT RECOMMENDED IF THE SOIL PH IS 5.0 OR ABOVE.
- (3) SEE SWITCHGRASS ESTABLISHMENT BUDGET.
- (4) SEE SWITCHGRASS RESEEDING BUDGET.

Table 8

**SWITCHGRASS ANNUAL PRODUCTION BUDGET: 6 YEAR PLANNING HORIZON
ESTIMATED LABOR, POWER AND MACHINERY INPUTS**

MONTH	OPERATION	EQUIPMENT	HOURS PER ACRE	
			MACHINE	LABOR
MAY	HERBICIDE SPRAY	Sprayer, 60' boom	0.03	0.03
	SPREAD FERTILIZER	Tractor, 150H.P.,W/Cab, Air	0.07	0.08
NOV/DEC	MOW	Mower	0.38	0.48
	RAKE	Rake	0.25	0.31
	BALE	Round Baler, PTO, Large Round	1.09	1.36
	STAGE/LOAD	Front End Loader	0.97	<u>1.21</u>
		TOTAL	3.48	

MACHINE	HOURS PER ACRE	-----INTEREST COST-----		-COST PER HOUR-		-----COST PER ACRE-----			
		PER HOUR	PER ACRE	F.C.	V.C.	FIXED	REPAIR	FUEL	VAR
Tractor, 150 HP	2.78	\$5.84	\$16.27	\$8.21	\$25.69	\$22.87	\$22.57	\$48.97	\$71.54
Sprayer	0.03	\$3.36	\$0.09	\$5.78	\$3.92	\$0.16	\$0.11	\$0.00	\$0.11
Mower	0.38	\$1.95	\$0.74	\$3.30	\$4.88	\$1.25	\$1.85	\$0.00	\$1.85
Rake	0.25	\$1.00	\$0.25	\$1.37	\$0.72	\$0.34	\$0.18	\$0.00	\$0.18
Baler	1.09	\$4.38	\$4.78	\$14.62	\$13.80	\$15.94	\$15.04	\$0.00	\$15.04
Loader	0.97	\$3.00	\$2.91	\$7.27	\$3.00	\$7.05	\$2.91	\$0.00	\$2.91

TOTAL		\$25.04		\$47.61	\$42.66	\$48.97	\$91.64
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--- PLEASE NOTE: TOTALS MAY BE DIFFERENT DUE TO ROUNDING. ---

Table 9

SWITCHGRASS ANNUAL PRODUCTION BUDGET: 10 YEAR PLANNING HORIZON
ESTIMATED EXPENSES PER ACRE

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>PRICE</u>	<u>AMOUNT</u>	<u>YOUR FARM</u>
REVENUE						
SWITCHGRASS	BIOMASS	TON	0	0	\$0.00	_____
VARIABLE EXPENSES						
FERTILIZER (1) (2)	NITROGEN	LB.	60	\$0.42	\$25.20	_____
	P2O5	LB.	40	\$0.32	\$12.80	_____
	K2O	LB.	80	\$0.22	\$17.60	_____
TRIPLE TIE	TWINE, 1500 LB. BALE	BALE	8.6	\$1.19	\$10.23	_____
WEED CONTROL						
POST-EMERGE	CIMARRON	OZ.	0.1	\$19.00	\$1.90	_____
POST-EMERGE	GRASS HERBICIDE	ACRE	1	\$7.00	\$7.00	_____
MACHINERY REPAIR		AC.	1	\$48.41	\$48.41	_____
MACHINERY FUEL	DIESEL @ \$2.10/GALLON	AC.	1	\$55.30	\$55.30	_____
OPERATING CAPITAL	6 MONTHS	AC.	\$178.45	8.00%	\$7.14	_____
					TOTAL VARIABLE EXPENSES	\$185.59 _____
MACHINERY EXPENSES						
MACHINERY DEPRECIATION		AC.	1	\$53.89	\$53.89	_____
INTEREST EXPENSE	MACHINERY & EQUIP.	AC.	1	\$28.30	\$28.30	_____
				MACHINERY COST	\$82.19	_____
LABOR EXPENSES						
LABOR		HR.	3.93	\$8.50	\$33.41	_____
				LABOR COST	\$33.41	_____
PRORATED ESTABLISHMENT COST (3)					\$33.12	_____
PRORATED RESEEDING COST (4)					\$7.01	_____
PRODUCTION COST, EXCLUDING LAND AND MANAGEMENT CHARGES					\$341.31	_____

FOOTNOTES

- (1) ASSUMES A SOIL TEST LOW IN P&K. **IF SOIL TEST VALUES ARE MEDIUM OR HIGH IN P&K, NO P2O5 OR K2O IS RECOMMENDED.** COST OF RENTING SPREADER IS INCLUDED IN THE FERTILIZER PRICE.
- (2) LIME IS NOT RECOMMENDED IF THE SOIL PH IS 5.0 OR ABOVE.
- (3) SEE SWITCHGRASS ESTABLISHMENT BUDGET.
- (4) SEE SWITCHGRASS RESEEDING BUDGET.

Table 10

SWITCHGRASS ANNUAL PRODUCTION BUDGET: 10 YEAR PLANNING HORIZON
ESTIMATED LABOR, POWER AND MACHINERY INPUTS

MONTH	OPERATION	EQUIPMENT	HOURS PER ACRE	
			MACHINE	LABOR
MAY	HERBICIDE SPRAY	Sprayer, 60' boom	0.03	0.03
	SPREAD FERTILIZER	Tractor, 150H.P., W/Cab, Air	0.07	0.08
NOV/DEC	MOW	Mower	0.44	0.55
	RAKE	Rake	0.29	0.36
	BALE	Round Baler, PTO, Large Round	1.25	1.56
	STAGE/LOAD	Front End Loader	1.07	1.34
TOTAL				3.93

MACHINE	HOURS PER ACRE	-----INTEREST COST-----		-COST PER HOUR-		-----COST PER ACRE-----			
		PER HOUR	PER ACRE	F.C.	V.C.	FIXED	REPAIR	FUEL	VAR
Tractor, 150 HP	3.14	\$5.84	\$18.37	\$8.21	\$25.69	\$25.82	\$25.49	\$55.30	\$80.79
Sprayer	0.03	\$3.36	\$0.09	\$5.78	\$3.92	\$0.16	\$0.11	\$0.00	\$0.11
Mower	0.44	\$1.95	\$0.86	\$3.30	\$4.88	\$1.45	\$2.15	\$0.00	\$2.15
Rake	0.29	\$1.00	\$0.29	\$1.37	\$0.72	\$0.40	\$0.21	\$0.00	\$0.21
Baler	1.25	\$4.38	\$5.48	\$14.62	\$13.80	\$18.27	\$17.25	\$0.00	\$17.25
Loader	1.07	\$3.00	\$3.21	\$7.27	\$3.00	\$7.78	\$3.21	\$0.00	\$3.21

TOTAL		\$28.30		\$53.89	\$48.41	\$55.30	\$103.71
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--- PLEASE NOTE: TOTALS MAY BE DIFFERENT DUE TO ROUNDING. ---

Chart 1
Switchgrass Yields by Production Year
with Reseeding 20% the First Year

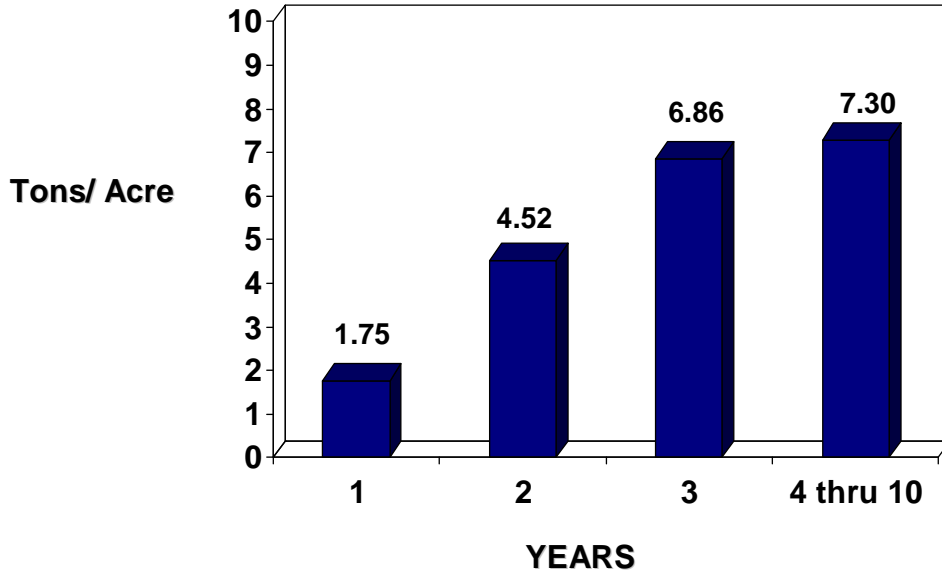


Chart 2
Average Annual Switchgrass Yields by
Different Planning Periods

