2-1995

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Abstract
Researchers evaluate the profitability of planting flood-tolerant crops in flood plains relative to traditional row crops under different assumptions concerning flood frequency and the level of government crop subsidy. Short rotation woody crops and herbaceous energy crops are evaluated for two growing environments. Results suggest that row crops dominate the flood-tolerant crops until flood frequency approaches 50 percent.

Disciplines
Agricultural and Resource Economics | Agricultural Economics | Economics

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Working Paper 95-WP 132
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This study was funded under Cooperative Agreement CR 8220450-10 between the Center of Agricultural and Rural Development at Iowa State University and the U.S. Environmental Protection Agency, Office of Policy Analysis.

ABSTRACT

The profitability of planting flood tolerant crops in flood plains relative to traditional row crops is evaluated under different assumptions concerning flood frequency and the level of government crop subsidy. The alternative crops evaluated are short rotation woody crops and herbaceous energy crops. The analysis is conducted for two growing environments: Louisa County, Iowa, and Salina County, Missouri. The economic indicator used to value the alternative scenarios is annualized net return per acre. This indicator can account for the significant time lags between planting and harvesting of the two alternative crops. The results indicate that row crops dominate the flood tolerant crops until flood frequency approaches 50 percent. The positive environmental benefits that would occur from converting land to flood tolerant crops could justify additional government subsidies to offset, at least in part, the higher net returns of traditional crops.

NET RETURNS OF ALTERNATIVE CROPS ON FLOOD-PRONE LAND: LOUISA COUNTY, IOWA, AND SALINE COUNTY, MISSOURI

The 1993 floods in the Upper Midwest were a catalyst for focusing attention on how flood-prone agricultural land should be managed and how government policy affects farmer cropping decisions. Current federal commodity programs encourage the production of program crops on flood-prone land (as well as other land) through direct subsidies. And federal disaster relief has encouraged production in flood-prone areas because farmers could depend on payments if their land (and enough of their neighbors' land) was flooded. In addition, the construction and repair of levees has encouraged cultivation of flood-prone land by decreasing the probability of crop losses from floods. The net result of these subsidies is an increase in the production of high-value crops that are very susceptible to flood-damage.

Many argue that a change in federal policy would result in a net positive benefit for society because of large environmental gains that would accrue from alternative uses of flood-prone land. For example, letting natural vegetation return to flood-prone land or having farmers plant flood-tolerant perennial crops would result in a number of environmental benefits. Some of the key ones include a reduction the frequency and severity of role flood stages, greater recharging of groundwater supplies, increased provision of water-based recreational benefits, improvements in water quality, and enhanced and protected wetland ecosystems.

In a previous study, (Kruse, Bouzaher, and Smith 1994) the economic costs and benefits of alternatives to rebuilding levees to pre-1993 flood conditions and the impact of removing commodity program support were analyzed. The analysis indicates that, in both Louisa County, Iowa, and Saline County, Missouri, the net present value of direct economic benefits, a common indicator of financial performance, is higher when levees are rebuilt and government programs maintained than for any of the scenarios over the 1995-99 simulation period. The analysis indicates that lower returns from these program crops would have detrimental effects on local and state economies. However, this analysis did not consider the economic benefits that might accrue from production of flood-tolerant crops. Two such crops are short rotation woody crops (SRWC) and herbaceous energy crops (HEC) that are well adapted to flood conditions and the general soil and climate conditions in the Midwest. In addition, the previous analysis did not account for the environmental benefits that would accrue from alternative uses of flood-prone land.

This report estimates the net returns from these two alternative crops under various assumptions about the level of government subsidy and flood frequency for the same two counties as the previous study: Louisa County, Iowa, and Salina County, Missouri. Study results allow insight into the conditions under which alternative crops will be an attractive alternative to current cropping patterns. In addition, a qualitative analysis of the environmental benefits that accrue from alternative cropping patterns are summarized.

Alternative Cropping Systems

Interest in HEC and SRWC as alternative crops for flood-prone land has increased because of their potential commercial vaiable as biomass crops and because they offer increased environmental amenities when compared with traditional row crops. Biomass crops are perennials that require establishment times of at least one year for grasses and at least four years for trees. These crops can yield multiple harvests before requiring replanting.

Among HEC, switchgrass has been identified as one of the most promising energy crops (Iowa DNR 1994) and is one of the species recommended for cover on Conservation Reserve Program land. Switchgrass is a warm-season grass native to the Midwest and grows 3 to 6 feet tall in all parts of Iowa. It is a deeply rooted perennial, well adapted to hold erodible soil. Its resistance to drought makes it somewhat more vulnerable to flooding than reed canarygrass, but it has comparatively lower establishment cost and higher yields. Experience in Iowa suggests that switchgrass, when seeded in early May, achieves maximum growth from June through September and is harvested in the fall. It requires yearly phosphorus and potassium applications, and can use 100 pounds of nitrogen per acre each year except during establishment years because nitrogen may encourage weed growth. Because switchgrass is vulnerable to weed competition during establishment, typically atrazine (2 pounds per acre) and 2,4-D (0.5 pounds per acre) applications are recommended for the first year (Hallam 1994).

SRWC are typically a mixture of several species and require intensive management. Tree species well adapted to midwestern flood plain conditions were identified as the best for SRWC in the study areas. These species include cottonwood, hybrid poplars, willow, silver maple, and sycamore. SRWC are planted in densities of 800 to 1,600 trees per acre and require herbicide during establishment, but little or no fertilizer during standing years. Trees are typically grown in rotations of 4 to 10 years and will regrow from their root stock after harvesting two or three times before requiring replanting. Trees, once established, are very tolerant of the severest flood conditions and normally suffer no stock or yield loss due to flooding. SRWC are only vulnerable to flood damage during establishment years.

The economic indicator used to value the alternative scenarios is annualized net return per acre for each crop, including payments from the Conservation Reserve Program. For row crops, projected local prices and yields are used to project net returns per acre for 1995-99 and to calculate a five-year average. The biomass crops use a 20-year constant dollar cash flows with yearly budgets that differentiate between establishment years and standing years to calculate annualized net returns per acre. Net returns per acre are computed as cash receipts minus variable costs (including establishment cost, but not land rent). Net returns are calculated with and without government subsidies under various assumptions about the frequency of floods. Because investments in HEC and SWRC will yield returns only in future years, a time horizon of more than one year is required to analyze their net returns. We use a 20-year time horizon in this study because 20 years allows for two complete rotations of SRWC.

Switchgrass is assumed to have an average yield of 10 metric tons per hectare per year and a high yield of 11 metric tons per hectare per year. No harvest is assumed for establishment years and the stands are assumed to last until their 10th year, when re-seeding is needed. In the case of SRWC, an annual yield of 10 metric tons per hectare per year for the first harvest (in the 10th year) and 12.5 metric tons per hectare per year for the second harvest (in the 20th year) is assumed for the average yield scenario. For the high-yield scenario, an annual equivalent yield of 11 metric tons per hectare per year for the first harvest and 13.75 metric tons per hectare per year for the second harvest are assumed. In this analysis, prices received for biomass crops are $40.00 per metric ton for the average price and $50.00 per metric ton for the high price. Typical establishment and standing year budgets for switchgrass are given in Tables C.1 and C.2 and those for SRWC are given in Tables C.3 and C.4.

Flood Frequency, Timing, and Severity

Assumptions about flood frequency, timing, and severity are crucial to estimating crop damage. Ideally, a flood simulation model, calibrated to site-specific environmental conditions and historic records, would be used to guide the analysis. But the lack of such a simulation model forces a different method. We analyze net returns under the following set of flood probabilities: 0, 10, 20, 50, and 100 percent. Floods are also assumed to occur at seeding and/or during the active growing season. Severity is assumed to be a flood at least two weeks long with still waters and low oxygen.

For all row crops, total crop loss is assumed during a flood year. Thus, expected revenue in any given year is revenue that would accrue with no flood multiplied by the probability of a flood. Net returns are then found by subtracting variable costs from expected revenue cash. This method overstates the losses from floods because harvesting costs would not be incurred in flood years.

Flood losses for switchgrass are assumed to be a total stock loss during an establishment year and a 50 percent stock loss and 50 percent yield loss during a standing year. For SRWC, which have only one establishment year during the 20-year simulation period, stock loss during a seeding year depends on the probability of flooding.

Probability of Flood		Seedling Loss
	percent	
100		50
50		40
20		20
10		0

Results

Louisa County

Table A.1 presents Louisa County average net returns with and without government subsidies for wheat, soybeans, continuous corn, corn after soybeans, switchgrass, and hybrid poplars for the five flood frequencies. Tables A.2 through A.11 present the data from which the results in Table A.1 are obtained.

From Table A.1, with no chance of flooding and with government subsidies, corn is the most profitable crop. This dominance continues until the fllod frequency increases to 50 percent, at which time the biomass crops become competitive. Soybeans become the most profitable crop if government subsidies are removed under all flood frequency scenarios except the 100 percent scenario. The implication of these results is that row crop production will likely continue on flood-prone land without increased subsidies for the biomass crops or more productive biomass cultivars.

Saline County

Table B.1 presents Saline County average net returns with and without government subsidies for wheat, soybeans, corn, switchgrass, and hybrid poplars for the five flood frequencies. Tables B.2 through B.11 present the data from which the results in Table B.1 are obtained.

In general, soybeans are the most profitable crop for flood frequencies less than 50 percent Corn only outperforms soybeans in the 0 percent scenario with government support, and then only by $1.27 per acre. Wheat follows corn, then switchgrass is next, and SRWC are the least profitable crop under all three scenarios with average biomass yields and prices. Not until the 50 percent scenario do biomass crops with average yields and prices outperform row crops, but the actual returns per acre are far below those for the lower probability scenarios. By the 100 percent scenario, only SRWC are profitable.

High yields and high prices increase the viability of biomass crops substantially, particularly for switchgrass. Even in the 0 percent scenario, switchgrass compares favorably with corn and soybeans. As flood probability increases, the returns per acre for switchgrass surpass all row crops, as long as government subsidies are maintained. In the 10, 20, and 50 percent scenarios, with high biomass yields and prices and government support, switchgrass is the most profitable crop, then soybeans and corn; wheat and SRWC are the least profitable. Without government support, soybeans remain the most profitable crop until the 50 percent scenario.

As in Louisa County, biomass crops require high yields and high prices and increased flooding to be economically preferential to row crops. In the 0, 10, and 20 percent scenarios, the viability of biomass crops must depend on environmental criteria and/or a substantial increase in government subsidies. Currently available government subsidies for land rent are not included in this analysis.

Qualitative Environmental Analysis of Biomass Production

The net returns analysis does not account for changes in environmental benefits from converting land to biomass production. Biomass crops create agro-ecosystems that provide habitat significantly different from natural ecosystems, but they still benefit plant and animal species. Both biomass crop types create additional wildlife habitat. For instance, HEC benefit grassland bird, rodent, and snake species, while SRWC benefit comparable forest species. Furthermore, SRWC include tree species that are usually found in flood plains of this region (silver maple, cottonwood, willow, and sycamore). The planting of SRWC can thus be considered the return of native species to their natural habitat, albeit in an artificial and highly controlled manner.

Biomass crops in areas not subject to frequent flooding generally provide more significant environmental benefits in ways other than providing habitat. The production and burning of biomass crops recycles atmospheric CO_2, while burning fossil fuels releases CO_2 from long-term storage and results in a net increase in atmospheric CO_2. Biomass fuels are cleaner burning than fossil fuels and release minimum SO_2 and NO_2. Both gases contribute to acid precipitation and nitrous oxides are also greenhouse gases (Iowa DNR 1994).

Perennial biomass crops also significantly benefit soil. The lack of annual tillage reduces soil compaction and thus increases soil porosity. Their deeper and more extensive root systems create substantially greater below-ground biomass, which increases the soil porosity and organic matter to levels above those found in soil dedicated to typical row crops and pasture. This enhances the soil's quality and increases its water holding capacity. This soil/root system can also more effectively immobilize nitrogen and other agricultural chemicals passing through the area in the surface water and root zone. Furthermore, water infiltration rates are substantially higher for this soil, which increases the flood storage capacity of the flood plain. Additional benefits include a larger transpiring surface, particularly for SRWC, which optimizes water and agricultural chemical uptake from the root zone and results in less nonpoint source pollution (Schultz et al. 1993). This greater rate of evapotranspiration also lowers the water table more quickly (especially significant for SRWC from mid-April to early October) and increases the flood storage capacity of the flood plain.

Other environmental benefits of biomass production include reduced agricultural chemical use. Herbicides are usually only needed in establishment years and SRWC require little or no fertilization, although HEC typically require annual fertilizer applications. These reduced requirements, coupled with the greater efficiency of biomass crops in agricultural chemical uptake, result in lower nonpoint source pollution from these fields. Finally, soil loss due to erosion by wind and water is greatly reduced.

If toppable levees (Louisa County) or set-back levees (Saline County) were built, these levees would create areas more prone to flooding. These areas might be economically viable for biomass production, as well as providing additional environmental benefits. In Louisa County the existing oxbow lakes and wetlands, which under the original levee design were usually seasonal wetlands, would increase in area and depth, as well as duration. Areas in Saline County (such as those enrolled in the EWRP/WRP) would develop in a similar manner as the Missouri River became reconnected with a part of its flood plain. This expansion and quality enhancement of moist soil and wetland habitat would have numerous positive impacts on plants and wildlife in these flood plains.

In Louisa County, the existing wetlands already serve as habitat for many plant and animal species, but their potential would expand. They could be used as off-channel nursery areas for a wide variety of fish species, including game species such as largemouth bass and bluegill. These seasonal wetlands already support moist soil plant species, such as wild millet and smartweed, as well as numerous grasses and sedges. These are an important source of food for water fowl and other migratory bird species using the Mississippi Flyway. A wide variety of water fowl currently use the area during migration, and wood ducks and hooded mergansers commonly breed in the area. Other migratory bird species such as mourning dove, woodcock, and passerine birds use the area for migratory habitat, while wading and shore birds use it for both migratory and breeding habitat. Saline County is similar and would develop in a similar manner in response to increased flooding. In general, as the frequency of flooding increases, the size and quality of these habitats increase, and they are used more by both plants and wildlife.

If flood-prone crop land were converted to biomass production, the loss of corn and soybean products would decrease the overall volume of migratory bird food available, but the quality would increase. HEC would provide food and habitat for migrating song birds, while SRWC would supply migrating water fowl with invertebrates in wet leaf litter as food. Habitat for Canada geese, however, would actually decrease. The enhancement of wildlife habitat would increase the potential for recreation in the area, such as hunting, trapping, fishing, bird watching, photography, wildlife observation, and spiritual renewal.

The toppable levees and the set-back levees would both expand the flood storage capacity of the flood plain without severely damaging the biomass crops subject to flooding. Biomass crops, especially SRWC, would reduce stream velocity from increased frictional interference, and thereby reduce flood stages. Furthermore, perennial soil cover and reduced current velocity both increase the retention of sediment and nutrients on the flood plain. The wetlands also help to retain sediment and nutrients, as well as process and remove some of the pollutants in flood water.

Concluding Remarks

The conversion of flood-prone lands from row crop production to biomass crop production is not likely to occur voluntarily unless (1) government subsidies to biomass crops are increased significantly above the level assumed in this analysis; or (2) market returns to biomass crops increase relative to row crops. Relative market returns could increase if new high-yielding biomass varieties are developed, the demand for biomass crops increase, or the demand for row crops decrease.

The positive environmental benefits that would occur from converting land to biomass crops could partly offset the lower market value placed on these crops. That is, it is possible that social welfare could be increased by withdrawing subsidies to row crops while maintaining or increasing subsidies to biomass crops on flood-prone land. Setting a value for the environmental amenities from biomass crops is critical to a judgment of whether or not this policy is justified. Efforts to conduct this valuation are the focus of future research.

APPENDIX A. LOUISA COUNTY RESULTS

Table A1: Average Net Returns by Crop and Levee Type for Louisa County, Excluding Levee Costs

	Wheat	Soybeans	Corn following Corn	Corn following Soybeans	Switchgrass	Hybrid Poplars
0% Probability of Flooding			dollars per acre			
With Government Support						
Average Yield, Average Price	88.84	126.34	142.87	156.16	54.67	31.25
High Yield, High Price	88.84	126.34	142.87	156.16	107.16	75.29
No Government Support						
Average Yield, Average Price	53.92	126.34	87.27	93.43	37.22	0.55
High Yield, High Price	53.92	126.34	87.27	93.43	89.71	44.59
10% Probability of Flooding						
With Government Support						
Average Yield, Average Price	76.40	103.72	118.23	131.51	52.18	31.25
High Yield, High Price	76.40	103.72	118.23	131.51	102.58	75.29
No Government Support						
Average Yield, Average Price	40.82	103.72	66.79	81.15	31.78	0.55
High Yield, High Price	40.82	103.72	66.79	81.15	82.18	44.59
20% Probability of Flooding						
With Government Support						
Average Yield, Average Price	63.95	81.09	93.58	106.87	48.92	28.87
High Yield, High Price	63.95	81.09	93.58	106.87	96.43	72.06
No Government Support						
Average Yield, Average Price	27.73	81.09	40.15	54.51	25.34	-5.56
High Yield, High Price	27.73	81.09	40.15	54.51	72.85	37.63
50% Probability of Flooding						
With Government Support						
Average Yield, Average Price	26.62	13.22	19.65	32.93	39.08	24.35
High Yield, High Price	26.62	13.22	19.65	32.93	77.85	66.05
No Government Support						
Average Yield, Average Price	-11.57	13.22	-39.78	-25.42	5.88	-17.21
High Yield, High Price	-11.57	13.22	-39.78	-25.42	44.65	24.49
100% Probability of Flooding						
With Government Support						
Average Yield, Average Price	-35.60	-99.90	-103.58	-90.29	-30.66	20.72
High Yield, High Price	-35.60	-99.90	-103.58	-90.29	-30.66	60.94
No Government Support						
Average Yield, Average Price	-77.07	-99.90	-173.00	-158.64	-106.43	-26.82
High Yield, High Price	-77.07	-99.90	-173.00	-158.64	-106.43	13.40

Table A2: No Flooding, Average Yield, Average Price for Louisa County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.2	44.5	44.7	44.9	45.2	44.7
Soybeans	39.4	39.6	39.8	40.0	40.2	39.8
Corn	121.7	122.3	122.9	123.6	124.2	122.9
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	3.12	3.07	2.87	2.82	2.77	2.93
Soybeans	5.60	5.78	5.69	5.68	5.69	5.69
Corn	2.15	2.20	2.11	2.18	2.20	2.17
Biomass	40.00	40.00	40.00	40.00	40.00	40.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	72.45	74.41	76.82	79.39	82.27	77.07
Soybeans	95.48	97.34	99.96	102.18	104.55	99.90
Corn following Corn	162.50	167.32	172.61	178.30	184.28	173.00
Corn following Soybeans	149.01	153.43	158.28	163.50	168.98	158.64
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	65.40	62.17	51.67	47.36	43.01	53.92
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	98.73	101.49	87.14	90.72	89.08	93.43
Corn following Soybeans	112.22	115.38	101.47	105.52	104.37	107.79
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	65.40	62.17	51.67	47.36	43.01	53.92
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	98.73	101.49	87.14	90.72	89.08	93.43
Corn following Soybeans	112.22	115.38	101.47	105.52	104.37	107.79
Switchgrass	37.22	37.22	37.22	37.22	37.22	37.22
Hybrid Poplars	0.55	0.55	0.55	0.55	0.55	0.55
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	31.13	32.70	39.61	41.49	43.14	37.61
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	58.43	53.49	61.70	55.47	53.15	56.45
Cost Share Assistance						
Switchgrass (Total)	17.45	17.45	17.45	17.45	17.45	17.45
75% of Establishment	9.36	9.36	9.36	9.36	9.36	9.36
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	30.70	30.70	30.70	30.70	30.70	30.70
75% of Establishment	22.61	22.61	22.61	22.61	22.61	22.61
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	93.27	91.76	88.70	86.49	84.00	88.84
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	149.76	147.37	142.31	139.39	135.55	142.87
Corn following Soybeans	162.23	160.21	155.56	153.08	149.70	156.16
Switchgrass	54.67	54.67	54.67	54.67	54.67	54.67
Hybrid Poplars	31.25	31.25	31.25	31.25	31.25	31.25

Table A3: No Flooding, High Yield, High Price for Louisa County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.2	44.5	44.7	44.9	45.2	44.7
Soybeans	39.4	39.6	39.8	40.0	40.2	39.8
Corn	121.7	122.3	122.9	123.6	124.2	122.9
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	3.12	3.07	2.87	2.82	2.77	2.93
Soybeans	5.60	5.78	5.69	5.68	5.69	5.69
Corn	2.15	2.20	2.11	2.18	2.20	2.17
Biomass	50.00	50.00	50.00	50.00	50.00	50.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	72.4	74.4	76.8	79.4	82.3	77.07
Soybeans	95.5	97.3	100.0	102.2	104.5	99.90
Corn following Corn	162.5	167.3	172.6	178.3	184.3	173.00
Corn following Soybeans	149.0	153.4	158.3	163.5	169.0	158.64
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	65.40	62.17	51.67	47.36	43.01	53.92
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	98.73	101.49	87.14	90.72	89.08	93.43
Corn following Soybeans	112.22	115.38	101.47	105.52	104.37	107.79
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	65.40	62.17	51.67	47.36	43.01	53.92
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	98.73	101.49	87.14	90.72	89.08	93.43
Corn following Soybeans	112.22	115.38	101.47	105.52	104.37	107.79
Switchgrass	89.71	89.71	89.71	89.71	89.71	89.71
Hybrid Poplars	44.59	44.59	44.59	44.59	44.59	44.59
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	31.13	32.70	39.61	41.49	43.14	37.61
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	58.43	53.49	61.70	55.47	53.15	56.45
Cost Share Assistance						
Switchgrass (Total)	17.45	17.45	17.45	17.45	17.45	17.45
75% of Establishment	9.36	9.36	9.36	9.36	9.36	9.36
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	30.70	30.70	30.70	30.70	30.70	30.70
75% of Establishment	22.61	22.61	22.61	22.61	22.61	22.61
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	93.27	91.76	88.70	86.49	84.00	88.84
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	149.76	147.37	142.31	139.39	135.55	142.87
Corn following Soybeans	162.23	160.21	155.56	153.08	149.70	156.16
Switchgrass	107.16	107.16	107.16	107.16	107.16	107.16
Hybrid Poplars	75.29	75.29	75.29	75.29	75.29	75.29

Table A4: 10% Probability of Flooding, Average Yield, Average Price for Louisa County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.2	44.5	44.7	44.9	45.2	44.7
Soybeans	39.4	39.6	39.8	40.0	40.2	39.8
Corn	121.7	122.3	122.9	123.6	124.2	122.9
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	3.12	3.07	2.87	2.82	2.77	2.93
Soybeans	5.60	5.78	5.69	5.68	5.69	5.69
Corn	2.15	2.20	2.11	2.18	2.20	2.17
Biomass	40.00	40.00	40.00	40.00	40.00	40.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	72.45	74.41	76.82	79.39	82.27	77.07
Soybeans	95.48	97.34	99.96	102.18	104.55	99.90
Corn following Corn	162.50	167.32	172.61	178.30	184.28	173.00
Corn following Soybeans	149.01	153.43	158.28	163.50	168.98	158.64
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	65.40	62.17	51.67	47.36	43.01	53.92
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	98.73	101.49	87.14	90.72	89.08	93.43
Corn following Soybeans	112.22	115.38	101.47	105.52	104.37	107.79
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	51.62	48.51	38.82	34.69	30.48	40.82
Soybeans	102.90	108.54	103.64	102.29	101.22	103.72
Corn following Corn	72.61	74.61	61.17	63.82	61.74	66.79
Corn following Soybeans	86.10	88.50	75.50	78.62	77.04	81.15
Switchgrass	31.78	31.78	31.78	31.78	31.78	31.78
Hybrid Poplars	0.55	0.55	0.55	0.55	0.55	0.55
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	31.13	32.70	39.61	41.49	43.14	37.61
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	58.43	53.49	61.70	55.47	53.15	56.45
Cost Share Assistance						
Switchgrass (Total)	20.40	20.40	20.40	20.40	20.40	20.40
75% of Establishment	12.31	12.31	12.31	12.31	12.31	12.31
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	30.70	30.70	30.70	30.70	30.70	30.70
75% of Establishment	22.61	22.61	22.61	22.61	22.61	22.61
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	80.17	78.79	76.50	74.44	72.09	76.40
Soybeans	102.90	108.54	103.64	102.29	101.22	103.72
Corn following Corn	125.59	122.50	118.28	114.50	110.26	118.23
Corn following Soybeans	138.07	135.35	131.53	128.20	124.41	131.51
Switchgrass	52.18	52.18	52.18	52.18	52.18	52.18
Hybrid Poplars	31.25	31.25	31.25	31.25	31.25	31.25

Table A5: 10% Probability of Flooding, High Yield, High Price for Louisa County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.2	44.5	44.7	44.9	45.2	44.7
Soybeans	39.4	39.6	39.8	40.0	40.2	39.8
Corn	121.7	122.3	122.9	123.6	124.2	122.9
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	3.12	3.07	2.87	2.82	2.77	2.93
Soybeans	5.60	5.78	5.69	5.68	5.69	5.69
Corn	2.15	2.20	2.11	2.18	2.20	2.17
Biomass	50.00	50.00	50.00	50.00	50.00	50.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	72.4	74.4	76.8	79.4	82.3	77.07
Soybeans	95.5	97.3	100.0	102.2	104.5	99.90
Corn following Corn	162.5	167.3	172.6	178.3	184.3	173.00
Corn following Soybeans	149.0	153.4	158.3	163.5	169.0	158.64
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	65.40	62.17	51.67	47.36	43.01	53.92
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	98.73	101.49	87.14	90.72	89.08	93.43
Corn following Soybeans	112.22	115.38	101.47	105.52	104.37	107.79
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	51.62	48.51	38.82	34.69	30.48	40.82
Soybeans	102.90	108.54	103.64	102.29	101.22	103.72
Corn following Corn	72.61	74.61	61.17	63.82	61.74	66.79
Corn following Soybeans	86.10	88.50	75.50	78.62	77.04	81.15
Switchgrass	82.18	82.18	82.18	82.18	82.18	82.18
Hybrid Poplars	44.59	44.59	44.59	44.59	44.59	44.59
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	31.13	32.70	39.61	41.49	43.14	37.61
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	58.43	53.49	61.70	55.47	53.15	56.45
Cost Share Assistance						
Switchgrass (Total)	20.40	20.40	20.40	20.40	20.40	20.40
75% of Establishment	12.31	12.31	12.31	12.31	12.31	12.31
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	30.70	30.70	30.70	30.70	30.70	30.70
75% of Establishment	22.61	22.61	22.61	22.61	22.61	22.61
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	80.17	78.79	76.50	74.44	72.09	76.40
Soybeans	102.90	108.54	103.64	102.29	101.22	103.72
Corn following Corn	125.59	122.50	118.28	114.50	110.26	118.23
Corn following Soybeans	138.07	135.35	131.53	128.20	124.41	131.51
Switchgrass	102.58	102.58	102.58	102.58	102.58	102.58
Hybrid Poplars	75.29	75.29	75.29	75.29	75.29	75.29

Table A6: 20% Probability of Flooding, Average Yield, Average Price for Louisa County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.2	44.5	44.7	44.9	45.2	44.7
Soybeans	39.4	39.6	39.8	40.0	40.2	39.8
Corn	121.7	122.3	122.9	123.6	124.2	122.9
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	3.12	3.07	2.87	2.82	2.77	2.93
Soybeans	5.60	5.78	5.69	5.68	5.69	5.69
Corn	2.15	2.20	2.11	2.18	2.20	2.17
Biomass	40.00	40.00	40.00	40.00	40.00	40.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	72.45	74.41	76.82	79.39	82.27	77.07
Soybeans	95.48	97.34	99.96	102.18	104.55	99.90
Corn following Corn	162.50	167.32	172.61	178.30	184.28	173.00
Corn following Soybeans	149.01	153.43	158.28	163.50	168.98	158.64
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	65.40	62.17	51.67	47.36	43.01	53.92
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	98.73	101.49	87.14	90.72	89.08	93.43
Corn following Soybeans	112.22	115.38	101.47	105.52	104.37	107.79
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	37.83	34.85	25.97	22.01	17.95	27.73
Soybeans	80.86	85.67	81.02	79.57	78.35	81.09
Corn following Corn	46.49	47.73	35.19	36.92	34.41	40.15
Corn following Soybeans	59.98	61.62	49.52	51.72	49.70	54.51
Switchgrass	25.34	25.34	25.34	25.34	25.34	25.34
Hybrid Poplars	-5.56	-5.56	-5.56	-5.56	-5.56	-5.56
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	31.13	32.70	39.61	41.49	43.14	37.61
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	58.43	53.49	61.70	55.47	53.15	56.45
Cost Share Assistance						
Switchgrass (Total)	23.58	23.58	23.58	23.58	23.58	23.58
75% of Establishment	15.49	15.49	15.49	15.49	15.49	15.49
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	34.43	34.43	34.43	34.43	34.43	34.43
75% of Establishment	26.34	26.34	26.34	26.34	26.34	26.34
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	67.07	65.81	64.29	62.40	60.19	63.95
Soybeans	80.86	85.67	81.02	79.57	78.35	81.09
Corn following Corn	101.43	97.64	94.25	89.62	84.98	93.58
Corn following Soybeans	113.91	110.49	107.51	103.31	99.13	106.87
Switchgrass	48.92	48.92	48.92	48.92	48.92	48.92
Hybrid Poplars	28.87	28.87	28.87	28.87	28.87	28.87

Table A7: 20% Probability of Flooding, High Yield, High Price for Louisa County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.2	44.5	44.7	44.9	45.2	44.7
Soybeans	39.4	39.6	39.8	40.0	40.2	39.8
Corn	121.7	122.3	122.9	123.6	124.2	122.9
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	3.12	3.07	2.87	2.82	2.77	2.93
Soybeans	5.60	5.78	5.69	5.68	5.69	5.69
Corn	2.15	2.20	2.11	2.18	2.20	2.17
Biomass	50.00	50.00	50.00	50.00	50.00	50.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	72.4	74.4	76.8	79.4	82.3	77.07
Soybeans	95.5	97.3	100.0	102.2	104.5	99.90
Corn following Corn	162.5	167.3	172.6	178.3	184.3	173.00
Corn following Soybeans	149.0	153.4	158.3	163.5	169.0	158.64
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	65.40	62.17	51.67	47.36	43.01	53.92
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	98.73	101.49	87.14	90.72	89.08	93.43
Corn following Soybeans	112.22	115.38	101.47	105.52	104.37	107.79
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	37.83	34.85	25.97	22.01	17.95	27.73
Soybeans	80.86	85.67	81.02	79.57	78.35	81.09
Corn following Corn	46.49	47.73	35.19	36.92	34.41	40.15
Corn following Soybeans	59.98	61.62	49.52	51.72	49.70	54.51
Switchgrass	72.85	72.85	72.85	72.85	72.85	72.85
Hybrid Poplars	37.63	37.63	37.63	37.63	37.63	37.63
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	31.13	32.70	39.61	41.49	43.14	37.61
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	58.43	53.49	61.70	55.47	53.15	56.45
Cost Share Assistance						
Switchgrass (Total)	23.58	23.58	23.58	23.58	23.58	23.58
75% of Establishment	15.49	15.49	15.49	15.49	15.49	15.49
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	34.43	34.43	34.43	34.43	34.43	34.43
75% of Establishment	26.34	26.34	26.34	26.34	26.34	26.34
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	67.07	65.81	64.29	62.40	60.19	63.95
Soybeans	80.86	85.67	81.02	79.57	78.35	81.09
Corn following Corn	101.43	97.64	94.25	89.62	84.98	93.58
Corn following Soybeans	113.91	110.49	107.51	103.31	99.13	106.87
Switchgrass	96.43	96.43	96.43	96.43	96.43	96.43
Hybrid Poplars	72.06	72.06	72.06	72.06	72.06	72.06

Table A8: 50% Probability of Flooding, Average Yield, Average Price for Louisa County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.2	44.5	44.7	44.9	45.2	44.7
Soybeans	39.4	39.6	39.8	40.0	40.2	39.8
Corn	121.7	122.3	122.9	123.6	124.2	122.9
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	3.12	3.07	2.87	2.82	2.77	2.93
Soybeans	5.60	5.78	5.69	5.68	5.69	5.69
Corn	2.15	2.20	2.11	2.18	2.20	2.17
Biomass	40.00	40.00	40.00	40.00	40.00	40.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	72.45	74.41	76.82	79.39	82.27	77.07
Soybeans	95.48	97.34	99.96	102.18	104.55	99.90
Corn following Corn	162.50	167.32	172.61	178.30	184.28	173.00
Corn following Soybeans	149.01	153.43	158.28	163.50	168.98	158.64
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	65.40	62.17	51.67	47.36	43.01	53.92
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	98.73	101.49	87.14	90.72	89.08	93.43
Corn following Soybeans	112.22	115.38	101.47	105.52	104.37	107.79
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	-3.52	-6.12	-12.57	-16.01	-19.63	-11.57
Soybeans	14.73	17.04	13.15	11.42	9.77	13.22
Corn following Corn	-31.88	-32.91	-42.74	-43.79	-47.60	-39.78
Corn following Soybeans	-18.39	-19.02	-28.41	-28.99	-32.30	-25.42
Switchgrass	5.88	5.88	5.88	5.88	5.88	5.88
Hybrid Poplars	-17.21	-17.21	-17.21	-17.21	-17.21	-17.21
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	31.13	32.70	39.61	41.49	43.14	37.61
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	58.43	53.49	61.70	55.47	53.15	56.45
Cost Share Assistance						
Switchgrass (Total)	33.20	33.20	33.20	33.20	33.20	33.20
75% of Establishment	25.11	25.11	25.11	25.11	25.11	25.11
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	41.56	41.56	41.56	41.56	41.56	41.56
75% of Establishment	33.47	33.47	33.47	33.47	33.47	33.47
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	27.79	26.89	27.67	26.28	24.49	26.62
Soybeans	14.73	17.04	13.15	11.42	9.77	13.22
Corn following Corn	28.94	23.04	22.17	14.97	9.12	19.65
Corn following Soybeans	41.42	35.89	35.42	28.66	23.27	32.93
Switchgrass	39.08	39.08	39.08	39.08	39.08	39.08
Hybrid Poplars	24.35	24.35	24.35	24.35	24.35	24.35

Table A9: 50% Probability of Flooding, High Yield, High Price for Louisa County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.2	44.5	44.7	44.9	45.2	44.7
Soybeans	39.4	39.6	39.8	40.0	40.2	39.8
Corn	121.7	122.3	122.9	123.6	124.2	122.9
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	3.12	3.07	2.87	2.82	2.77	2.93
Soybeans	5.60	5.78	5.69	5.68	5.69	5.69
Corn	2.15	2.20	2.11	2.18	2.20	2.17
Biomass	50.00	50.00	50.00	50.00	50.00	50.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	72.4	74.4	76.8	79.4	82.3	77.07
Soybeans	95.5	97.3	100.0	102.2	104.5	99.90
Corn following Corn	162.5	167.3	172.6	178.3	184.3	173.00
Corn following Soybeans	149.0	153.4	158.3	163.5	169.0	158.64
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	65.40	62.17	51.67	47.36	43.01	53.92
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	98.73	101.49	87.14	90.72	89.08	93.43
Corn following Soybeans	112.22	115.38	101.47	105.52	104.37	107.79
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	-3.52	-6.12	-12.57	-16.01	-19.63	-11.57
Soybeans	14.73	17.04	13.15	11.42	9.77	13.22
Corn following Corn	-31.88	-32.91	-42.74	-43.79	-47.60	-39.78
Corn following Soybeans	-18.39	-19.02	-28.41	-28.99	-32.30	-25.42
Switchgrass	44.65	44.65	44.65	44.65	44.65	44.65
Hybrid Poplars	24.49	24.49	24.49	24.49	24.49	24.49
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	31.13	32.70	39.61	41.49	43.14	37.61
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	58.43	53.49	61.70	55.47	53.15	56.45
Cost Share Assistance						
Switchgrass (Total)	33.20	33.20	33.20	33.20	33.20	33.20
75% of Establishment	25.11	25.11	25.11	25.11	25.11	25.11
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	41.56	41.56	41.56	41.56	41.56	41.56
75% of Establishment	33.47	33.47	33.47	33.47	33.47	33.47
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	27.79	26.89	27.67	26.28	24.49	26.62
Soybeans	14.73	17.04	13.15	11.42	9.77	13.22
Corn following Corn	28.94	23.04	22.17	14.97	9.12	19.65
Corn following Soybeans	41.42	35.89	35.42	28.66	23.27	32.93
Switchgrass	77.85	77.85	77.85	77.85	77.85	77.85
Hybrid Poplars	66.05	66.05	66.05	66.05	66.05	66.05

Table A10: 100% Probability of Flooding, Average Yield, Average Price for Louisa County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.2	44.5	44.7	44.9	45.2	44.7
Soybeans	39.4	39.6	39.8	40.0	40.2	39.8
Corn	121.7	122.3	122.9	123.6	124.2	122.9
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	3.12	3.07	2.87	2.82	2.77	2.93
Soybeans	5.60	5.78	5.69	5.68	5.69	5.69
Corn	2.15	2.20	2.11	2.18	2.20	2.17
Biomass	40.00	40.00	40.00	40.00	40.00	40.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	72.45	74.41	76.82	79.39	82.27	77.07
Soybeans	95.48	97.34	99.96	102.18	104.55	99.90
Corn following Corn	162.50	167.32	172.61	178.30	184.28	173.00
Corn following Soybeans	149.01	153.43	158.28	163.50	168.98	158.64
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	65.40	62.17	51.67	47.36	43.01	53.92
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	98.73	101.49	87.14	90.72	89.08	93.43
Corn following Soybeans	112.22	115.38	101.47	105.52	104.37	107.79
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	-72.45	-74.41	-76.82	-79.39	-82.27	-77.07
Soybeans	-95.48	-97.34	-99.96	-102.18	-104.55	-99.90
Corn following Corn	-162.50	-167.32	-172.61	-178.30	-184.28	-173.00
Corn following Soybeans	-149.01	-153.43	-158.28	-163.50	-168.98	-158.64
Switchgrass	-106.43	-106.43	-106.43	-106.43	-106.43	-106.43
Hybrid Poplars	-26.82	-26.82	-26.82	-26.82	-26.82	-26.82
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	31.13	32.70	39.61	41.49	43.14	37.61
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	58.43	53.49	61.70	55.47	53.15	56.45
Cost Share Assistance						
Switchgrass (Total)	75.77	75.77	75.77	75.77	75.77	75.77
75% of Establishment	67.68	67.68	67.68	67.68	67.68	67.68
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	47.54	47.54	47.54	47.54	47.54	47.54
75% of Establishment	39.45	39.45	39.45	39.45	39.45	39.45
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	-37.69	-37.99	-33.37	-33.93	-35.02	-35.60
Soybeans	-95.48	-97.34	-99.96	-102.18	-104.55	-99.90
Corn following Corn	-91.88	-101.28	-97.97	-109.45	-117.30	-103.58
Corn following Soybeans	-79.40	-88.43	-84.71	-95.76	-103.15	-90.29
Switchgrass	-30.66	-30.66	-30.66	-30.66	-30.66	-30.66
Hybrid Poplars	20.72	20.72	20.72	20.72	20.72	20.72

Table A11: 100% Probability of Flooding, High Yield, High Price for Louisa County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.2	44.5	44.7	44.9	45.2	44.7
Soybeans	39.4	39.6	39.8	40.0	40.2	39.8
Corn	121.7	122.3	122.9	123.6	124.2	122.9
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	3.12	3.07	2.87	2.82	2.77	2.93
Soybeans	5.60	5.78	5.69	5.68	5.69	5.69
Corn	2.15	2.20	2.11	2.18	2.20	2.17
Biomass	50.00	50.00	50.00	50.00	50.00	50.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	72.4	74.4	76.8	79.4	82.3	77.07
Soybeans	95.5	97.3	100.0	102.2	104.5	99.90
Corn following Corn	162.5	167.3	172.6	178.3	184.3	173.00
Corn following Soybeans	149.0	153.4	158.3	163.5	169.0	158.64
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	65.40	62.17	51.67	47.36	43.01	53.92
Soybeans	124.94	131.42	126.26	125.01	124.08	126.34
Corn following Corn	98.73	101.49	87.14	90.72	89.08	93.43
Corn following Soybeans	112.22	115.38	101.47	105.52	104.37	107.79
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	-72.45	-74.41	-76.82	-79.39	-82.27	-77.07
Soybeans	-95.48	-97.34	-99.96	-102.18	-104.55	-99.90
Corn following Corn	-162.50	-167.32	-172.61	-178.30	-184.28	-173.00
Corn following Soybeans	-149.01	-153.43	-158.28	-163.50	-168.98	-158.64
Switchgrass	-106.43	-106.43	-106.43	-106.43	-106.43	-106.43
Hybrid Poplars	13.40	13.40	13.40	13.40	13.40	13.40
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	31.13	32.70	39.61	41.49	43.14	37.61
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	58.43	53.49	61.70	55.47	53.15	56.45
Cost Share Assistance						
Switchgrass (Total)	75.77	75.77	75.77	75.77	75.77	75.77
75% of Establishment	67.68	67.68	67.68	67.68	67.68	67.68
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	47.54	47.54	47.54	47.54	47.54	47.54
75% of Establishment	39.45	39.45	39.45	39.45	39.45	39.45
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	-37.69	-37.99	-33.37	-33.93	-35.02	-35.60
Soybeans	-95.48	-97.34	-99.96	-102.18	-104.55	-99.90
Corn following Corn	-91.88	-101.28	-97.97	-109.45	-117.30	-103.58
Corn following Soybeans	-79.40	-88.43	-84.71	-95.76	-103.15	-90.29
Switchgrass	-30.66	-30.66	-30.66	-30.66	-30.66	-30.66
Hybrid Poplars	60.94	60.94	60.94	60.94	60.94	60.94

APPENDIX B. SALINE COUNTY RESULTS

Table B1: Average Net Returns by Crop and Levee Type for Saline County, Excluding Levee Costs

	Wheat	Soybeans	Corn	Switchgrass	Hybrid Poplars
0% Probability of Flooding			dollars per acre		
With Government Support					
Average Yield, Average Price	87.02	113.96	115.23	54.67	31.25
High Yield, High Price	87.02	113.96	115.23	107.16	75.29
No Government Support					
Average Yield, Average Price	53.85	113.96	87.27	37.22	0.55
High Yield, High Price	53.85	113.96	87.27	89.71	44.59
10% Probability of Flooding					
With Government Support					
Average Yield, Average Price	74.44	94.65	92.80	52.18	31.25
High Yield, High Price	74.44	94.65	92.80	102.58	75.29
No Government Support					
Average Yield, Average Price	40.61	94.65	63.02	31.78	0.55
High Yield, High Price	40.61	94.65	63.02	82.18	44.59
20% Probability of Flooding					
With Government Support					
Average Yield, Average Price	61.85	75.33	70.37	48.92	28.87
High Yield, High Price	61.85	75.33	70.37	96.43	72.06
No Government Support					
Average Yield, Average Price	27.36	75.33	38.77	25.34	-5.56
High Yield, High Price	27.36	75.33	38.77	72.85	37.63
50% Probability of Flooding					
With Government Support					
Average Yield, Average Price	24.10	17.40	3.08	39.08	24.35
High Yield, High Price	24.10	17.40	3.08	77.85	66.05
No Government Support					
Average Yield, Average Price	-12.38	17.40	-33.97	5.88	-17.21
High Yield, High Price	-12.38	17.40	-33.97	44.65	24.49
100% Probability of Flooding					
With Government Support					
Average Yield, Average Price	-38.82	-79.16	-109.07	-30.66	20.72
High Yield, High Price	-38.82	-79.16	-109.07	-30.66	60.94
No Government Support					
Average Yield, Average Price	-78.62	-79.16	-155.21	-106.43	-26.82
High Yield, High Price	-78.62	-79.16	-155.21	-106.43	13.40

Table B2: No Flooding, Average Yield, Average Price for Saline County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.3	44.6	44.8	45.1	45.3	44.8
Soybeans	33.8	33.9	34.0	34.1	34.2	34.0
Corn	103.6	104.3	105.0	105.7	106.3	105.0
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	2.92	2.88	2.92	2.93	3.13	2.96
Soybeans	5.58	5.77	5.67	5.67	5.68	5.67
Corn	2.28	2.35	2.25	2.32	2.35	2.31
Biomass	40.00	40.00	40.00	40.00	40.00	40.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	73.22	75.57	78.44	81.38	84.48	78.62
Soybeans	76.54	77.60	79.07	80.57	82.00	79.16
Corn	146.45	150.22	155.03	159.86	164.49	155.21
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	56.12	52.85	52.34	50.71	57.25	53.85
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	89.72	94.82	81.14	85.26	85.42	87.27
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	56.12	52.85	52.34	50.71	57.25	53.85
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	89.72	94.82	81.14	85.26	85.42	87.27
Switchgrass	37.22	37.22	37.22	37.22	37.22	37.22
Hybrid Poplars	0.55	0.55	0.55	0.55	0.55	0.55
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	37.10	38.47	37.10	36.76	29.89	35.86
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	36.85	31.36	39.20	33.72	31.36	34.50
Cost Share Assistance						
Switchgrass (Total)	17.45	17.45	17.45	17.45	17.45	17.45
75% of Establishment	9.36	9.36	9.36	9.36	9.36	9.36
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	30.70	30.70	30.70	30.70	30.70	30.70
75% of Establishment	22.61	22.61	22.61	22.61	22.61	22.61
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	90.41	88.68	86.82	84.93	84.27	87.02
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	119.84	119.07	114.26	112.58	110.38	115.23
Switchgrass	54.67	54.67	54.67	54.67	54.67	54.67
Hybrid Poplars	31.25	31.25	31.25	31.25	31.25	31.25

Table B3: No Flooding, High Yield, High Price for Saline County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.3	44.6	44.8	45.1	45.3	44.8
Soybeans	33.8	33.9	34.0	34.1	34.2	34.0
Corn	103.6	104.3	105.0	105.7	106.3	105.0
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	2.92	2.88	2.92	2.93	3.13	2.96
Soybeans	5.58	5.77	5.67	5.67	5.68	5.67
Corn	2.28	2.35	2.25	2.32	2.35	2.31
Biomass	50.00	50.00	50.00	50.00	50.00	50.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	73.22	75.57	78.44	81.38	84.48	78.62
Soybeans	76.54	77.60	79.07	80.57	82.00	79.16
Corn	146.45	150.22	155.03	159.86	164.49	155.21
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	56.12	52.85	52.34	50.71	57.25	53.85
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	89.72	94.82	81.14	85.26	85.42	87.27
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	56.12	52.85	52.34	50.71	57.25	53.85
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	89.72	94.82	81.14	85.26	85.42	87.27
Switchgrass	89.71	89.71	89.71	89.71	89.71	89.71
Hybrid Poplars	44.59	44.59	44.59	44.59	44.59	44.59
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	37.10	38.47	37.10	36.76	29.89	35.86
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	36.85	31.36	39.20	33.72	31.36	34.50
Cost Share Assistance						
Switchgrass (Total)	17.45	17.45	17.45	17.45	17.45	17.45
75% of Establishment	9.36	9.36	9.36	9.36	9.36	9.36
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	30.70	30.70	30.70	30.70	30.70	30.70
75% of Establishment	22.61	22.61	22.61	22.61	22.61	22.61
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	90.41	88.68	86.82	84.93	84.27	87.02
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	119.84	119.07	114.26	112.58	110.38	115.23
Switchgrass	107.16	107.16	107.16	107.16	107.16	107.16
Hybrid Poplars	75.29	75.29	75.29	75.29	75.29	75.29

Table B4: 10% Probability of Flooding, Average Yield, Average Price for Saline County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.3	44.6	44.8	45.1	45.3	44.8
Soybeans	33.8	33.9	34.0	34.1	34.2	34.0
Corn	103.6	104.3	105.0	105.7	106.3	105.0
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	2.92	2.88	2.92	2.93	3.13	2.96
Soybeans	5.58	5.77	5.67	5.67	5.68	5.67
Corn	2.28	2.35	2.25	2.32	2.35	2.31
Biomass	40.00	40.00	40.00	40.00	40.00	40.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	73.22	75.57	78.44	81.38	84.48	78.62
Soybeans	76.54	77.60	79.07	80.57	82.00	79.16
Corn	146.45	150.22	155.03	159.86	164.49	155 21
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	56.12	52.85	52.34	50.71	57.25	53.85
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	89.72	94.82	81.14	85.26	85.42	87.27
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	43.18	40.01	39.26	37.50	43.07	40.61
Soybeans	93.39	98.63	94.61	93.61	92.99	94.65
Corn	66.10	70.32	57.52	60.75	60.43	63.02
Switchgrass	31.78	31.78	31.78	31.78	31.78	31.78
Hybrid Poplars	0.55	0.55	0.55	0.55	0.55	0.55
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	37.10	38.47	37.10	36.76	29.89	35.86
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	36.85	31.36	39.20	33.72	31.36	34.50
Cost Share Assistance						
Switchgrass (Total)	20.40	20.40	20.40	20.40	20.40	20.40
75% of Establishment	12.31	12.31	12.31	12.31	12.31	12.31
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	30.70	30.70	30.70	30.70	30.70	30.70
75% of Establishment	22.61	22.61	22.61	22.61	22.61	22.61
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	78.12	76.48	74.40	72.38	70.81	74.44
Soybeans	93.39	98.63	94.61	93.61	92.99	94.65
Corn	98.00	96.41	92.41	89.91	87.26	92.80
Switchgrass	52.18	52.18	52.18	52.18	52.18	52.18
Hybrid Poplars	31.25	31.25	31.25	31.25	31.25	31.25

Table B5: 10% Probability of Flooding, High Yield, High Price for Saline County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.3	44.6	44.8	45.1	45.3	44.8
Soybeans	33.8	33.9	34.0	34.1	34.2	34.0
Corn	103.6	104.3	105.0	105.7	106.3	105.0
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	2.92	2.88	2.92	2.93	3.13	2.96
Soybeans	5.58	5.77	5.67	5.67	5.68	5.67
Corn	2.28	2.35	2.25	2.32	2.35	2.31
Biomass	50.00	50.00	50.00	50.00	50.00	50.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	73.22	75.57	78.44	81.38	84.48	78.62
Soybeans	76.54	77.60	79.07	80.57	82.00	79.16
Corn	146.45	150.22	155.03	159.86	164.49	155.21
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	56.12	52.85	52.34	50.71	57.25	53.85
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	89.72	94.82	81.14	85.26	85.42	87.27
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	43.18	40.01	39.26	37.50	43.07	40.61
Soybeans	93.39	98.63	94.61	93.61	92.99	94.65
Corn	66.10	70.32	57.52	60.75	60.43	63.02
Switchgrass	82.18	82.18	82.18	82.18	82.18	82.18
Hybrid Poplars	44.59	44.59	44.59	44.59	44.59	44.59
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	37.10	38.47	37.10	36.76	29.89	35.86
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	36.85	31.36	39.20	33.72	31.36	34.50
Cost Share Assistance						
Switchgrass (Total)	20.40	20.40	20.40	20.40	20.40	20.40
75% of Establishment	12.31	12.31	12.31	12.31	12.31	12.31
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	30.70	30.70	30.70	30.70	30.70	30.70
75% of Establishment	22.61	22.61	22.61	22.61	22.61	22.61
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	78.12	76.48	74.40	72.38	70.81	74.44
Soybeans	93.39	98.63	94.61	93.61	92.99	94.65
Corn	98.00	96.41	92.41	89.91	87.26	92.80
Switchgrass	102.58	102.58	102.58	102.58	102.58	102.58
Hybrid Poplars	75.29	75.29	75.29	75.29	75.29	75.29

Table B6: 20% Probability of Flooding, Average Yield, Average Price for Saline County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.3	44.6	44.8	45.1	45.3	44.8
Soybeans	33.8	33.9	34.0	34.1	34.2	34.0
Corn	103.6	104.3	105.0	105.7	106.3	105.0
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	2.92	2.88	2.92	2.93	3.13	2.96
Soybeans	5.58	5.77	5.67	5.67	5.68	5.67
Corn	2.28	2.35	2.25	2.32	2.35	2.31
Biomass	40.00	40.00	40.00	40.00	40.00	40.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	73.22	75.57	78.44	81.38	84.48	78.62
Soybeans	76.54	77.60	79.07	80.57	82.00	79.16
Corn	146.45	150.22	155.03	159.86	164.49	155.21
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	56.12	52.85	52.34	50.71	57.25	53.85
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	89.72	94.82	81.14	85.26	85.42	87.27
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	30.25	27.16	26.18	24.29	28.90	27.36
Soybeans	74.51	79.05	75.31	74.26	73.55	75.33
Corn	42.48	45.81	33.90	36.23	35.44	38.77
Switchgrass	25.34	25.34	25.34	25.34	25.34	25.34
Hybrid Poplars	-5.56	-5.56	-5.56	-5.56	-5.56	-5.56
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	37.10	38.47	37.10	36.76	29.89	35.86
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	36.85	31.36	39.20	33.72	31.36	34.50
Cost Share Assistance						
Switchgrass (Total)	23.58	23.58	23.58	23.58	23.58	23.58
75% of Establishment	15.49	15.49	15.49	15.49	15.49	15.49
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	34.43	34.43	34.43	34.43	34.43	34.43
75% of Establishment	26.34	26.34	26.34	26.34	26.34	26.34
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	65.84	64.28	61.97	59.84	57.34	61.85
Soybeans	74.51	79.05	75.31	74.26	73.55	75.33
Corn	76.15	73.74	70.57	67.23	64.14	70.37
Switchgrass	48.92	48.92	48.92	48.92	48.92	48.92
Hybrid Poplars	28.87	28.87	28.87	28.87	28.87	28.87

Table B7: 20% Probability of Flooding, High Yield, High Price for Saline County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.3	44.6	44.8	45.1	45.3	44.8
Soybeans	33.8	33.9	34.0	34.1	34.2	34.0
Corn	103.6	104.3	105.0	105.7	106.3	105.0
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	2.92	2.88	2.92	2.93	3.13	2.96
Soybeans	5.58	5.77	5.67	5.67	5.68	5.67
Corn	2.28	2.35	2.25	2.32	2.35	2.31
Biomass	50.00	50.00	50.00	50.00	50.00	50.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	73.22	75.57	78.44	81.38	84.48	78.62
Soybeans	76.54	77.60	79.07	80.57	82.00	79.16
Corn	146.45	150.22	155.03	159.86	164.49	155.21
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	56.12	52.85	52.34	50.71	57.25	53.85
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	89.72	94.82	81.14	85.26	85.42	87.27
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	30.25	27.16	26.18	24.29	28.90	27.36
Soybeans	74.51	79.05	75.31	74.26	73.55	75.33
Corn	42.48	45.81	33.90	36.23	35.44	38.77
Switchgrass	72.85	72.85	72.85	72.85	72.85	72.85
Hybrid Poplars	37.63	37.63	37.63	37.63	37.63	37.63
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	37.10	38.47	37.10	36.76	29.89	35.86
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	36.85	31.36	39.20	33.72	31.36	34.50
Cost Share Assistance						
Switchgrass (Total)	23.58	23.58	23.58	23.58	23.58	23.58
75% of Establishment	15.49	15.49	15.49	15.49	15.49	15.49
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	34.43	34.43	34.43	34.43	34.43	34.43
75% of Establishment	26.34	26.34	26.34	26.34	26.34	26.34
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	65.84	64.28	61.97	59.84	57.34	61.85
Soybeans	74.51	79.05	75.31	74.26	73.55	75.33
Corn	76.15	73.74	70.57	67.23	64.14	70.37
Switchgrass	96.43	96.43	96.43	96.43	96.43	96.43
Hybrid Poplars	72.06	72.06	72.06	72.06	72.06	72.06

Table B8: 50% Probability of Flooding, Average Yield, Average Price for Saline County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.3	44.6	44.8	45.1	45.3	44.8
Soybeans	33.8	33.9	34.0	34.1	34.2	34.0
Corn	103.6	104.3	105.0	105.7	106.3	105.0
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	2.92	2.88	2.92	2.93	3.13	2.96
Soybeans	5.58	5.77	5.67	5.67	5.68	5.67
Corn	2.28	2.35	2.25	2.32	2.35	2.31
Biomass	40.00	40.00	40.00	40.00	40.00	40.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	73.22	75.57	78.44	81.38	84.48	78.62
Soybeans	76.54	77.60	79.07	80.57	82.00	79.16
Corn	146.45	150.22	155.03	159.82	164.49	155.21
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	56.12	52.85	52.34	50.71	57.25	53.85
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	89.72	94.82	81.14	85.26	85.42	87.27
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	-8.55	-11.36	-13.05	-15.33	-13.62	-12.38
Soybeans	17.87	20.30	17.42	16.20	15.22	17.40
Corn	-28.37	-27.70	-36.95	-37.30	-39.53	-33.97
Switchgrass	5.88	5.88	5.88	5.88	5.88	5.88
Hybrid Poplars	-17.21	-17.21	-17.21	-17.21	-17.21	-17.21
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	37.10	38.47	37.10	36.76	29.89	35.86
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	36.85	31.36	39.20	33.72	31.36	34.50
Cost Share Assistance						
Switchgrass (Total)	33.20	33.20	33.20	33.20	33.20	33.20
75% of Establishment	25.11	25.11	25.11	25.11	25.11	25.11
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	41.56	41.56	41.56	41.56	41.56	41.56
75% of Establishment	33.47	33.47	33.47	33.47	33.47	33.47
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	28.98	27.68	24.70	22.19	16.95	24.10
Soybeans	17.87	20.30	17.42	16.20	15.22	17.40
Corn	10.61	5.74	5.03	-0.79	-5.21	3.08
Switchgrass	39.08	39.08	39.08	39.08	39.08	39.08
Hybrid Poplars	24.35	24.35	24.35	24.35	24.35	24.35

Table B9: 50% Probability of Flooding, High Yield, High Price for Saline County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.3	44.6	44.8	45.1	45.3	44.8
Soybeans	33.8	33.9	34.0	34.1	34.2	34.0
Corn	103.6	104.3	105.0	105.7	106.3	105.0
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	2.92	2.88	2.92	2.93	3.13	2.96
Soybeans	5.58	5.77	5.67	5.67	5.68	5.67
Corn	2.28	2.35	2.25	2.32	2.35	2.31
Biomass	50.00	50.00	50.00	50.00	50.00	50.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	73.22	75.57	78.44	81.38	84.48	78.62
Soybeans	76.54	77.60	79.07	80.57	82.00	79.16
Corn	146.45	150.22	155.03	159.86	164.49	155.21
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	56.12	52.85	52.34	50.71	57.25	53.85
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	89.72	94.82	81.14	85.26	85.42	87.27
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	-8.55	-11.36	-13.05	-15.33	-13.62	-12.38
Soybeans	17.87	20.30	17.42	16.20	15.22	17.40
Corn	-28.37	-27.70	-36.95	-37.30	-39.53	-33.97
Switchgrass	44.65	44.65	44.65	44.65	44.65	44.65
Hybrid Poplars	24.49	24.49	24.49	24.49	24.49	24.49
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	37.10	38.47	37.10	36.76	29.89	35.86
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	36.85	31.36	39.20	33.72	31.36	34.50
Cost Share Assistance						
Switchgrass (Total)	33.20	33.20	33.20	33.20	33.20	33.20
75% of Establishment	25.11	25.11	25.11	25.11	25.11	25.11
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	41.56	41.56	41.56	41.56	41.56	41.56
75% of Establishment	33.47	33.47	33.47	33.47	33.47	33.47
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	28.98	27.68	24.70	22.19	16.95	24.10
Soybeans	17.87	20.30	17.42	16.20	15.22	17.40
Corn	10.61	5.74	5.03	-0.79	-5.21	3.08
Switchgrass	77.85	77.85	77.85	77.85	77.85	77.85
Hybrid Poplars	66.05	66.05	66.05	66.05	66.05	66.05

Table B10: 100% Probability of Flooding, Average Yield, Average Price for Saline County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.3	44.6	44.8	45.1	45.3	44.8
Soybeans	33.8	33.9	34.0	34.1	34.2	34.0
Corn	103.6	104.3	105.0	105.7	106.3	105.0
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	2.92	2.88	2.92	2.93	3.13	2.96
Soybeans	5.58	5.77	5.67	5.67	5.68	5.67
Corn	2.28	2.35	2.25	2.32	2.35	2.31
Biomass	40.00	40.00	40.00	40.00	40.00	40.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	73.22	75.57	78.44	81.38	84.48	78.62
Soybeans	76.54	77.60	79.07	80.57	82.00	79.16
Corn	146.45	150.22	155.03	159.86	164.49	155.21
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	56.12	52.85	52.34	50.71	57.25	53.85
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	89.72	94.82	81.14	85.26	85.42	87.27
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	-73.22	-75.57	-78.44	-81.38	-84.48	-78.62
Soybeans	-76.54	-77.60	-79.07	-80.57	-82.00	-79.16
Corn	-146.45	-150.22	-155.03	-159.86	-164.49	-155.21
Switchgrass	-106.43	-106.43	-106.43	-106.43	-106.43	-106.43
Hybrid Poplars	-26.82	-26.82	-26.82	-26.82	-26.82	-26.82
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	37.10	38.47	37.10	36.76	29.89	35.86
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	36.85	31.36	39.20	33.72	31.36	34.50
Cost Share Assistance						
Switchgrass (Total)	75.77	75.77	75.77	75.77	75.77	75.77
75% of Establishment	67.68	67.68	67.68	67.68	67.68	67.68
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	47.54	47.54	47.54	47.54	47.54	47.54
75% of Establishment	39.45	39.45	39.45	39.45	39.45	39.45
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	-32.46	-33.32	-37.42	-40.56	-50.37	-38.82
Soybeans	-76.54	-77.60	-79.07	-80.57	-82.00	-79.16
Corn	-98.61	-107.59	-104.20	-114.15	-120.79	-109.07
Switchgrass	-30.66	-30.66	-30.66	-30.66	-30.66	-30.66
Hybrid Poplars	20.72	20.72	20.72	20.72	20.72	20.72

Table B11: 100% Probability of Flooding, High Yield, High Price for Saline County

	1995	1996	1997	1998	1999	Average
Yield Per Harvested Acre, No Government Programs						
			bushels per acre			
Wheat	44.3	44.6	44.8	45.1	45.3	44.8
Soybeans	33.8	33.9	34.0	34.1	34.2	34.0
Corn	103.6	104.3	105.0	105.7	106.3	105.0
Baseline Crop Prices, No Government Programs						
			dollars per bushel or metric ton			
Wheat	2.92	2.88	2.92	2.93	3.13	2.96
Soybeans	5.58	5.77	5.67	5.67	5.68	5.67
Corn	2.28	2.35	2.25	2.32	2.35	2.31
Biomass	50.00	50.00	50.00	50.00	50.00	50.00
Variable Costs of Production, No Government Programs, No Tax						
			dollars per planted acre			
Wheat	73.22	75.57	78.44	81.38	84.48	78.62
Soybeans	76.54	77.60	79.07	80.57	82.00	79.16
Corn	146.45	150.22	155.03	159.86	164.49	155.21
Harvested Net Returns Over Variable Costs, No Government Programs						
			dollars per harvested acre			
Wheat	56.12	52.85	52.34	50.71	57.25	53.85
Soybeans	112.27	118.21	113.90	112.96	112.44	113.96
Corn	89.72	94.82	81.14	85.26	85.42	87.27
Net Returns Over Variable Costs, No Government Programs						
			dollars per planted and considered planted acre			
Wheat	-73.22	-75.57	-78.44	-81.38	-84.48	-78.62
Soybeans	-76.54	-77.60	-79.07	-80.57	-82.00	-79.16
Corn	-146.45	-150.22	-155.03	-159.86	-164.49	-155.21
Switchgrass	-106.43	-106.43	-106.43	-106.43	-106.43	-106.43
Hybrid Poplars	13.40	13.40	13.40	13.40	13.40	13.40
Government Support						
Deficiency Payments			dollars per planted and considered planted acre			
Wheat	37.10	38.47	37.10	36.76	29.89	35.86
Soybeans	0.00	0.00	0.00	0.00	0.00	0.00
Corn	36.85	31.36	39.20	33.72	31.36	34.50
Cost Share Assistance						
Switchgrass (Total)	75.77	75.77	75.77	75.77	75.77	75.77
75% of Establishment	67.68	67.68	67.68	67.68	67.68	67.68
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Hybrid Poplars (Total)	47.54	47.54	47.54	47.54	47.54	47.54
75% of Establishment	39.45	39.45	39.45	39.45	39.45	39.45
50% of Management	8.09	8.09	8.09	8.09	8.09	8.09
Net Returns Over Variable Costs, With Government Programs						
			dollars per planted and considered planted acre			
Wheat	-32.46	-33.32	-37.42	-40.56	-50.37	-38.82
Soybeans	-76.54	-77.60	-79.07	-80.57	-82.00	-79.16
Corn	-98.61	-107.59	-104.20	-114.15	-120.79	-109.07
Switchgrass	-30.66	-30.66	-30.66	-30.66	-30.66	-30.66
Hybrid Poplars	60.94	60.94	60.94	60.94	60.94	60.94

APPENDIX C. ADDITIONAL DATA

Typical Establishment and Standing Year Budgets For Switchgrass

Table C1: Establishment Year Budget for Switchgrass

No Flooding, Average Yield, Average Price, No Subsidies

ACTIVITY		$/ACRE
Site Preparation		$11.01
Seed and Planting		$37.31
Fertilizer (P&K)		$28.27
Herbicide (Atrazine & 2,4-D)		$6.95
	Total Cost	$83.54

Table C2: Standing Year Budget for Switchgrass

No Flooding, Average Yield, Average Price, No Subsidies

ACTIVITY		$/ACRE
Fertilizer (N P K)		$53.54
Annual Management		$16.19
Harvest Cost		$18.07
Transportation		$18.69
	Total Cost	$106.49
INCOME		$161.80
	Net Return	$55.31

Typical Establishment and Standing Year Budgets For Short Rotation Woody Crops

Table C3: Establishment Year Budget for SRWC

No Flooding, Average Yield, Average Price, No Subsidies

ACTIVITY		$/ACRE
Site Preparation		$50.18
Planting		$276.41
Herbicide		$48.97
	Total Cost	$375.56

Table C4: Harvest Year Budget for SRWC

No Flooding, Average Yield, Average Price, No Subsidies

ACTIVITY		$/ACRE
Annual Management		$16.19
Harvest & Transportation		$450.54
	Total Cost	$466.73
INCOME		$1,618.75
	Net Return	$1,152.02

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