Potential Changes in Agricultural Land Use Triggered by Growing Bioenergy Dedicated Crops

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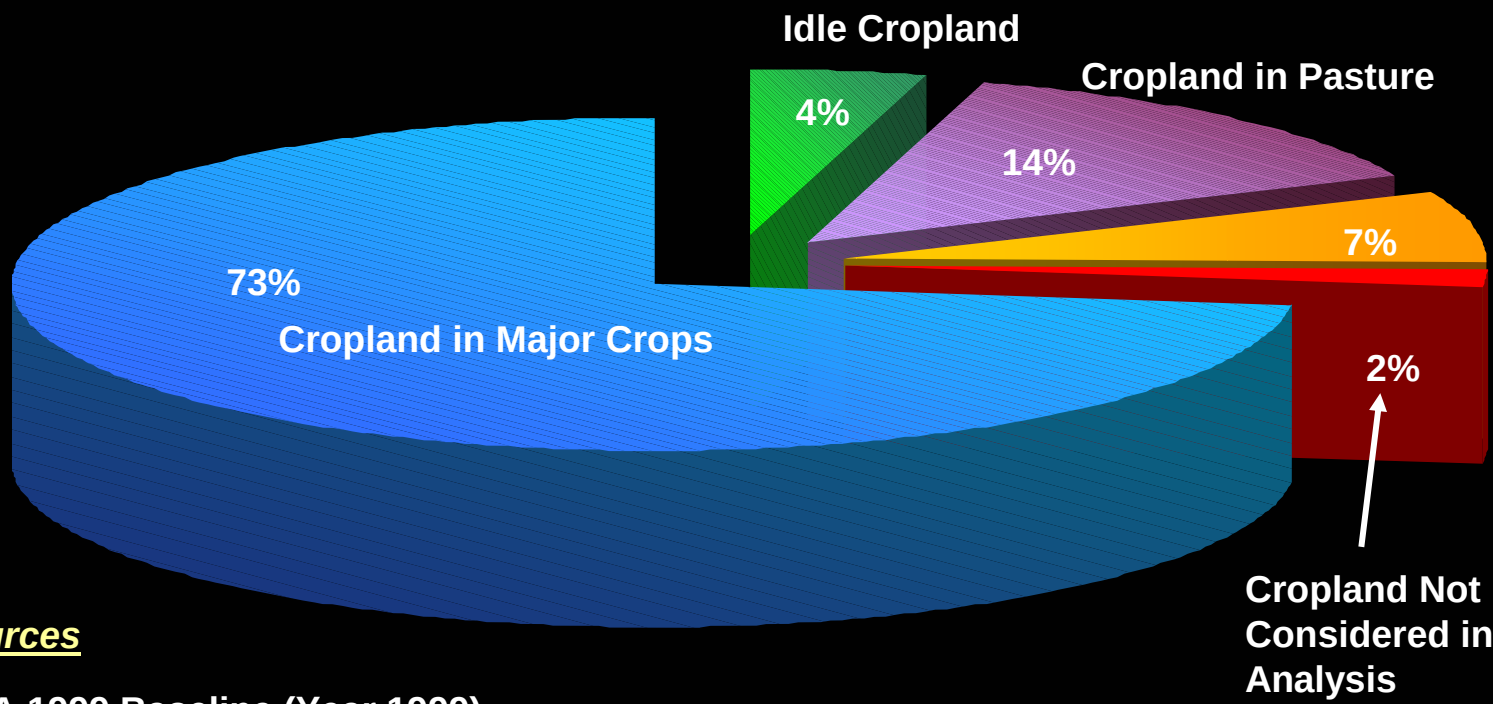
Project Supported by:

United States Department of Agriculture

United States Department of Energy

Sources: Daniel G. De La Torre Ugarte (UT/APAC), Marie E. Walsh (DOE/ORNL), Hosein Shapouri (USDA/OEPNU), and Stephen P. Slinsky (UT/APAC). "The Economic Impacts of Bioenergy Crop Production in U.S. Agriculture." (2000)

Cropland Categories

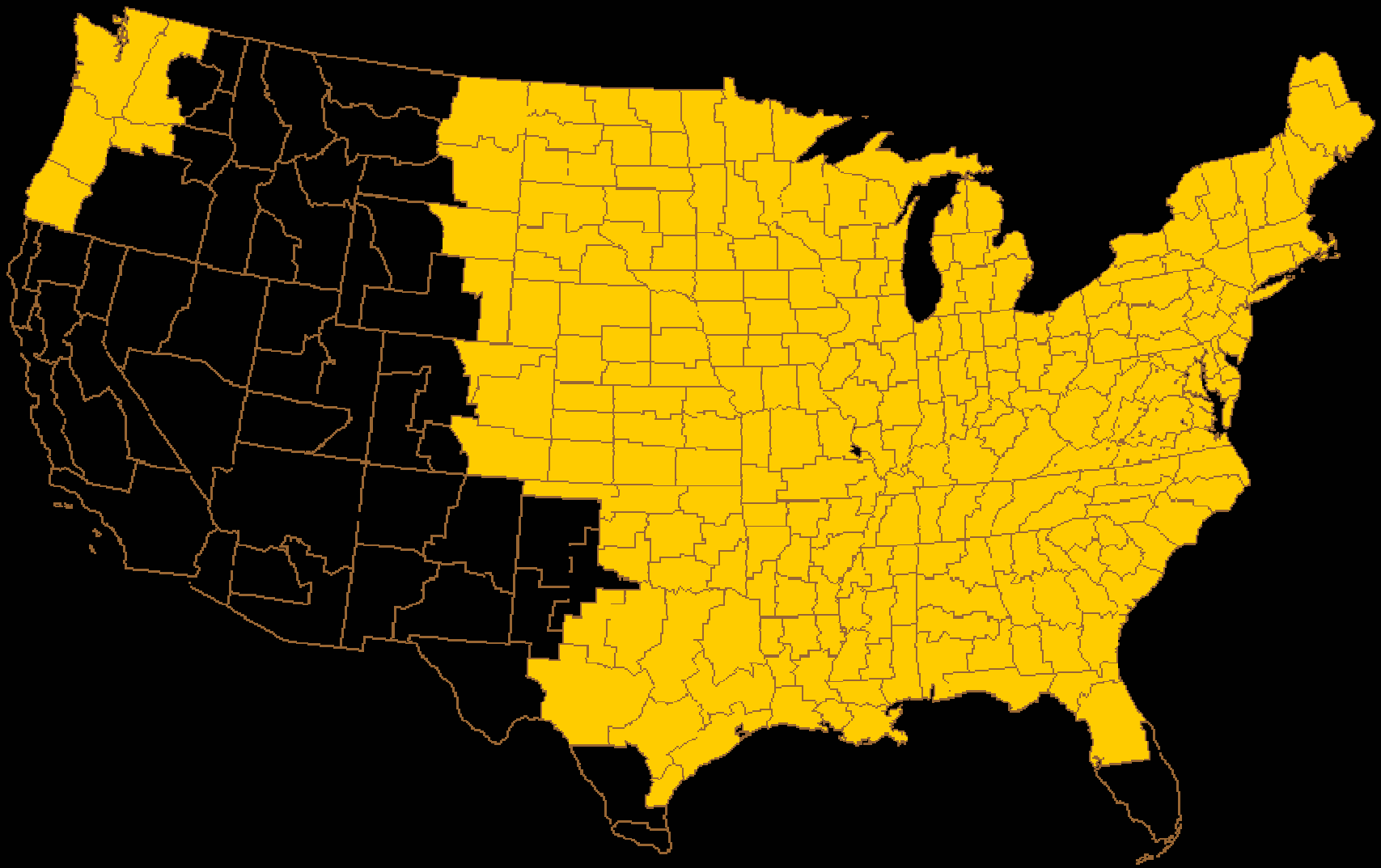


Data Sources

- USDA 1999 Baseline (Year 1999)
- 1997 Ag. Census (Idle Cropland)
- 1997 Ag. Census (Land in Pasture)
- Land Enrolled in CRP (through October 1998 – Farm Service Agency)
- Diff. Between Census U.S. Cropland & That Considered in Analysis

Sources: Daniel G. De La Torre Ugarte (UT/APAC), Marie E. Walsh (DOE/ORNL), Hosein Shapouri (USDA/OEPNU), and Stephen P. Slinsky (UT/APAC). "The Economic Impacts of Bioenergy Crop Production in U.S. Agriculture." (2000)

Bioenergy Crop Prod'n Regions



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Cropland Summary

Crop	Total Acreage in Analysis	Acres Assumed Suitable for Bioenergy Crop Production	
	(Mil. Acres)	(Mil. Acres)	(% of Total Acres)
Major Crops *	314.9	282.5	89.7%
CRP	29.8	16.9	56.7%
Idle	19.0	14.7	77.4%
Pasture	60.3	53.8	89.2%
TOTAL **	424.0	367.9	86.8%

* Includes corn, soybeans, sorghum, oats, barley, wheat, cotton, rice, alfalfa, and other hays.
** Excludes 7.4 million acres in other uses such as fruits, vegetables and other minor crops.

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Comparison Between Scenarios

Wildlife Management Scenario		Production Management Scenario	
Farmgate Crop Price	$1.94/MBtu	Farmgate Crop Price	$2.58/MBtu
• Switchgrass	$30.00/dt	• Switchgrass	$40.00/dt
• Willow	$31.74/dt	• Willow	$42.32/dt
• Hybrid Poplar	$32.90/dt	• Hybrid Poplar	$43.87/dt
Management Practices on CRP land		Management Practices on CRP land	
• Fewer fertilizer & chemical inputs		• Standard fertilizer & chemical inputs	
• Annual switchgrass harvest is limited to alternating halves each year		• Annual switchgrass harvest of whole field	
Retain 75% CRP rental rate		Retain 75% CRP rental rate	

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Plantings in Bioenergy Crops 2008

Crop	Million Acres				
	Wildlife Management Scenario				
	Cropland	*Major Crops*	*CRP*	*Idle*	*Pasture*
Switchgrass	12.32	10.44	1.1	0.23	0.55
Poplars	7.1	0	7.1	0	0
All Bioenergy	19.42	10.44	8.2	0.23	0.55
	Production Management Scenario				
	Cropland	*Major Crops*	*CRP*	*Idle*	*Pasture*
Switchgrass	41.87	23.37	12.91	2.09	3.49
Poplars	0	0	0	0	0
All Bioenergy	41.87	23.37	12.91	2.09	3.19

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Change In Total Plantings 2008

Crop	Million Acres		
	USDA Baseline (Feb. 1999)	Wildlife Management Scenario	Production Management Scenario
	Acres	*Difference*	*Difference*
Corn	82.00	-1.40	-3.70
Sorghum	10.60	0.00	-0.40
Oats	4.70	-0.10	-0.10
Barley	7.00	0.00	0.00
Wheat	73.10	-1.40	-6.20
Soybeans	71.80	-1.90	-3.40
Cotton	12.80	-0.50	-0.70
Rice	3.20	-0.10	-0.10
Alfalfa	27.10	-1.00	-2.20
Other Hay	33.10	-2.50	-3.70
Bioenergy	0.00	19.40	41.90
Total Planted	325.40	10.50	21.40
Total CRP	29.79	-8.20	-12.90

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Price Changes in 2008

Crop	Baseline	Value		Difference	
		Wildlife	Production	Wildlife	Production
Corn/ bu.	2.55	2.65	2.79	0.10	0.24
Sorghum/ bu.	2.44	2.57	2.77	0.13	0.33
Oats/ bu.	1.50	1.58	1.67	0.08	0.17
Barley/ bu.	2.35	2.43	2.55	0.08	0.20
Wheat/ bu.	4.25	4.40	4.74	0.15	0.49
Soybeans/ bu.	6.10	6.42	6.71	0.32	0.61
Cotton/ lb.	0.68	0.74	0.77	0.06	0.09
Rice/ cwt.	10.37	11.23	11.37	0.86	1.00

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Changes in Net Farm Income 2008

	Billions of $		
	USDA Baseline (Feb. 1999)	Wildlife Management Scenario	Production Management Scenario
Crops $ Livestock	50.5	52.6	54.2
Bioenergy Crops	0	0.7	2.3
Total Net Farm Income	50.5	53.3	56.5

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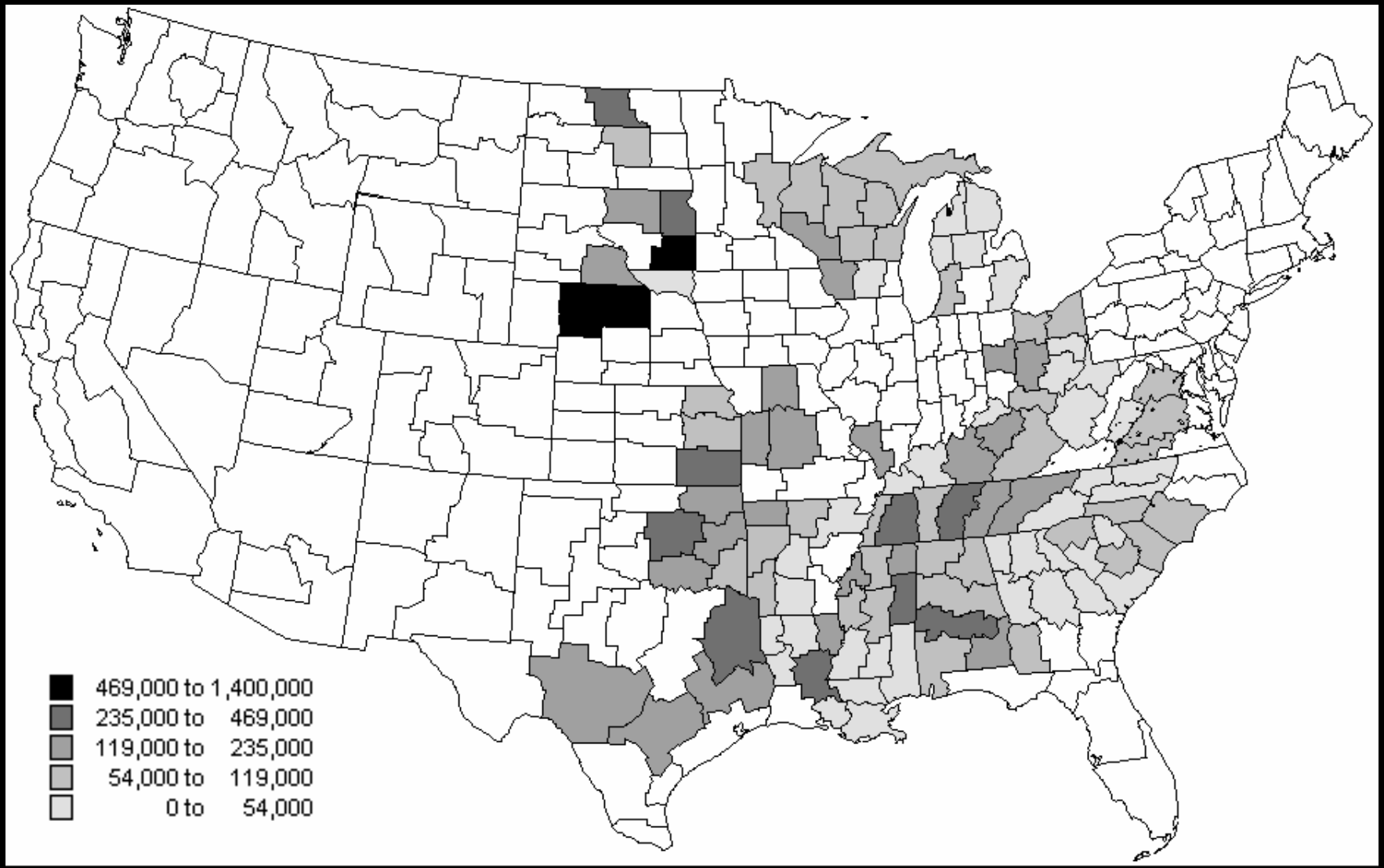
Wildlife Management Scenario
Acres Planted to Switchgrass, 2008



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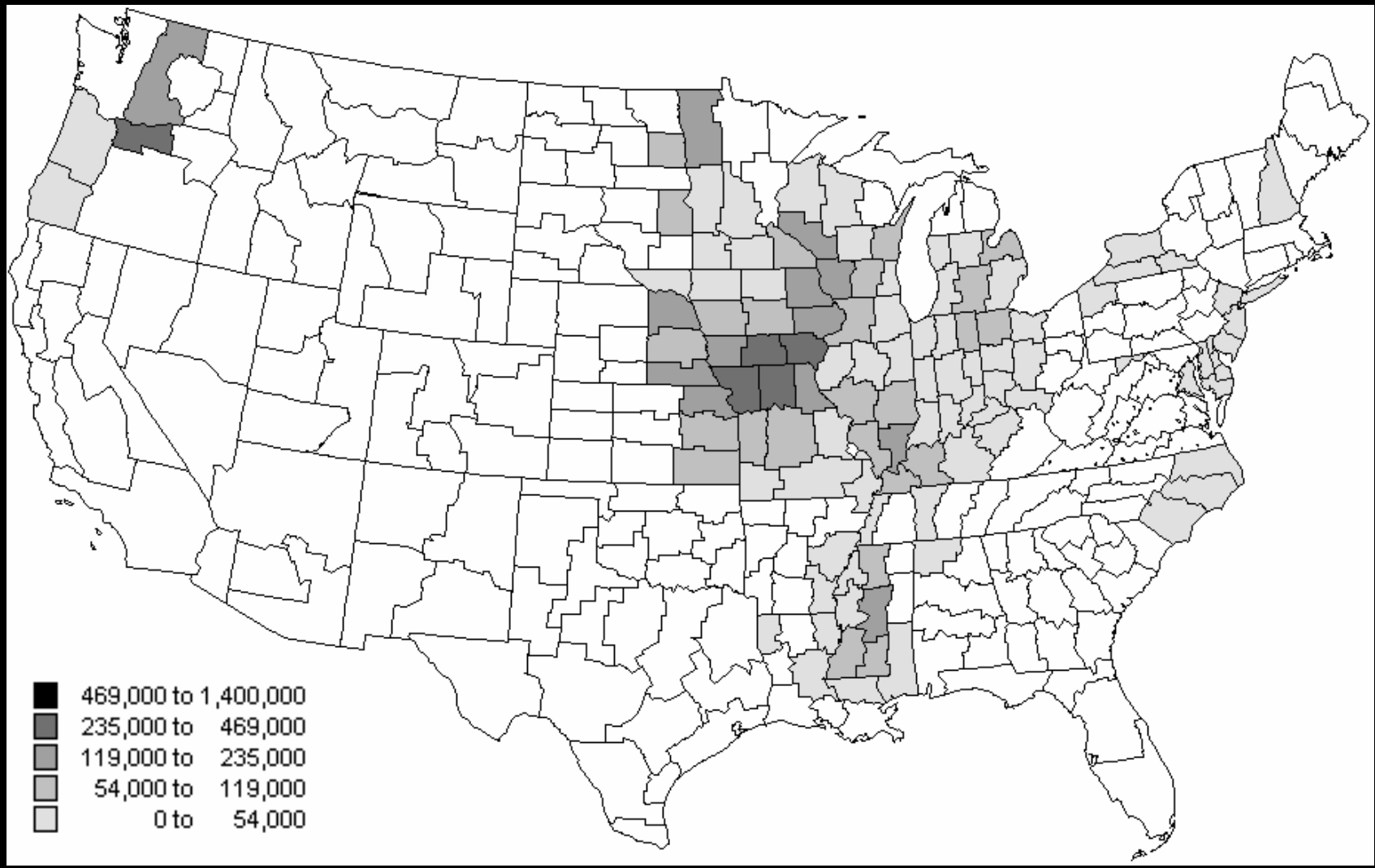
Wildlife Management Scenario
Acres Planted to Poplars, 2008



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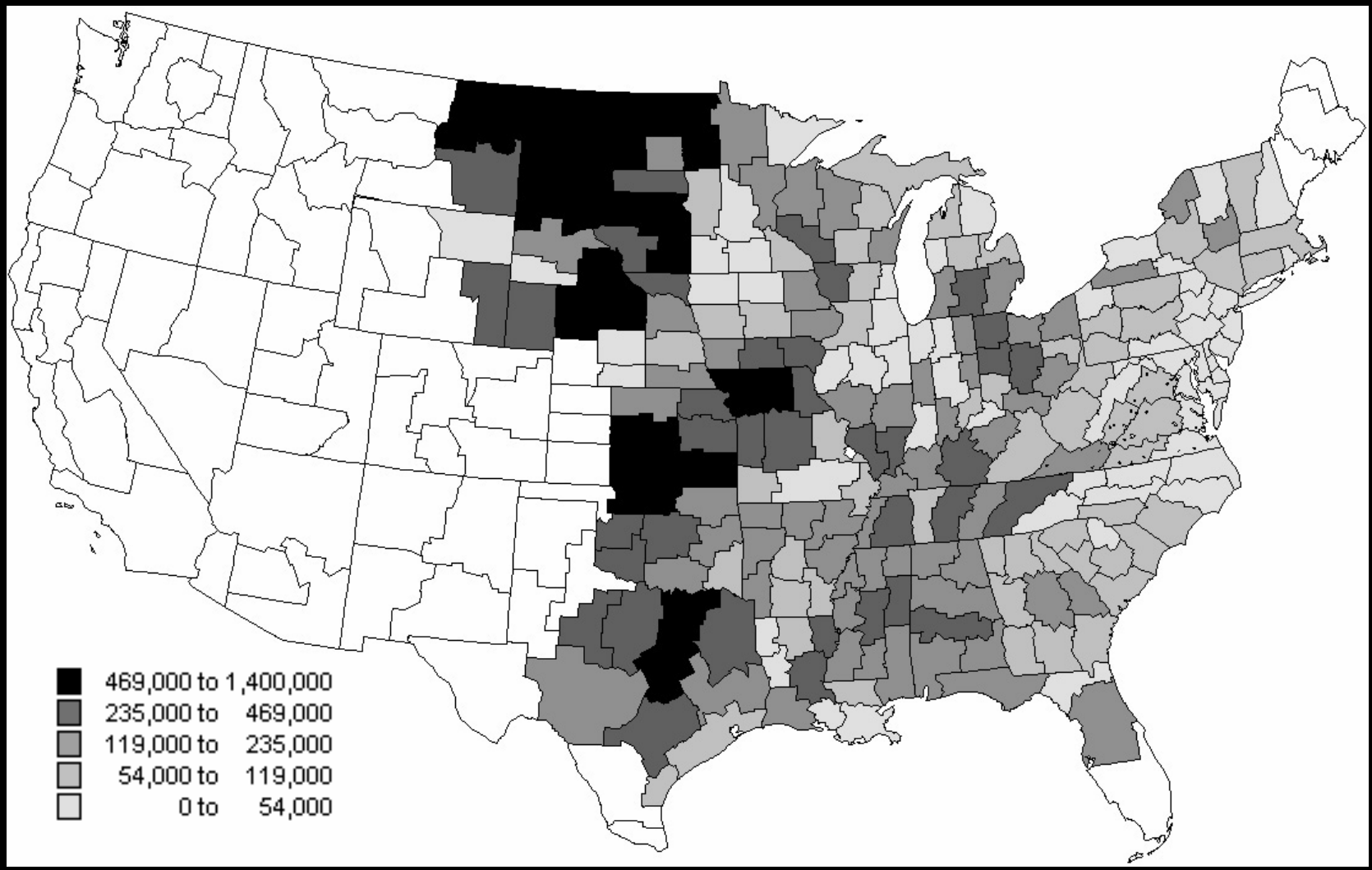
Production Management Scenario
Acres Planted to Switchgrass, 2008



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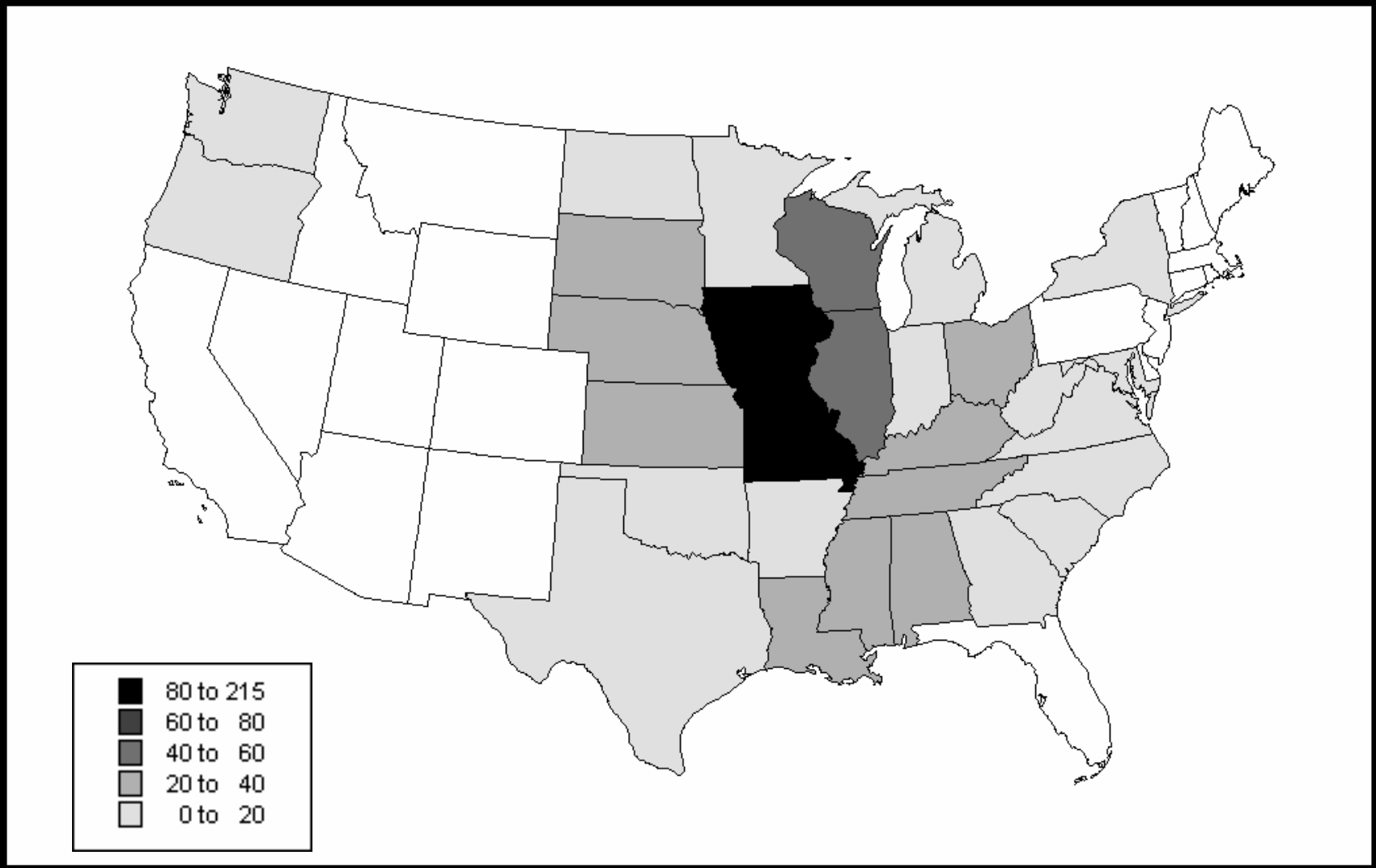
Wildlife Management Scenario
Change in Income, 2008



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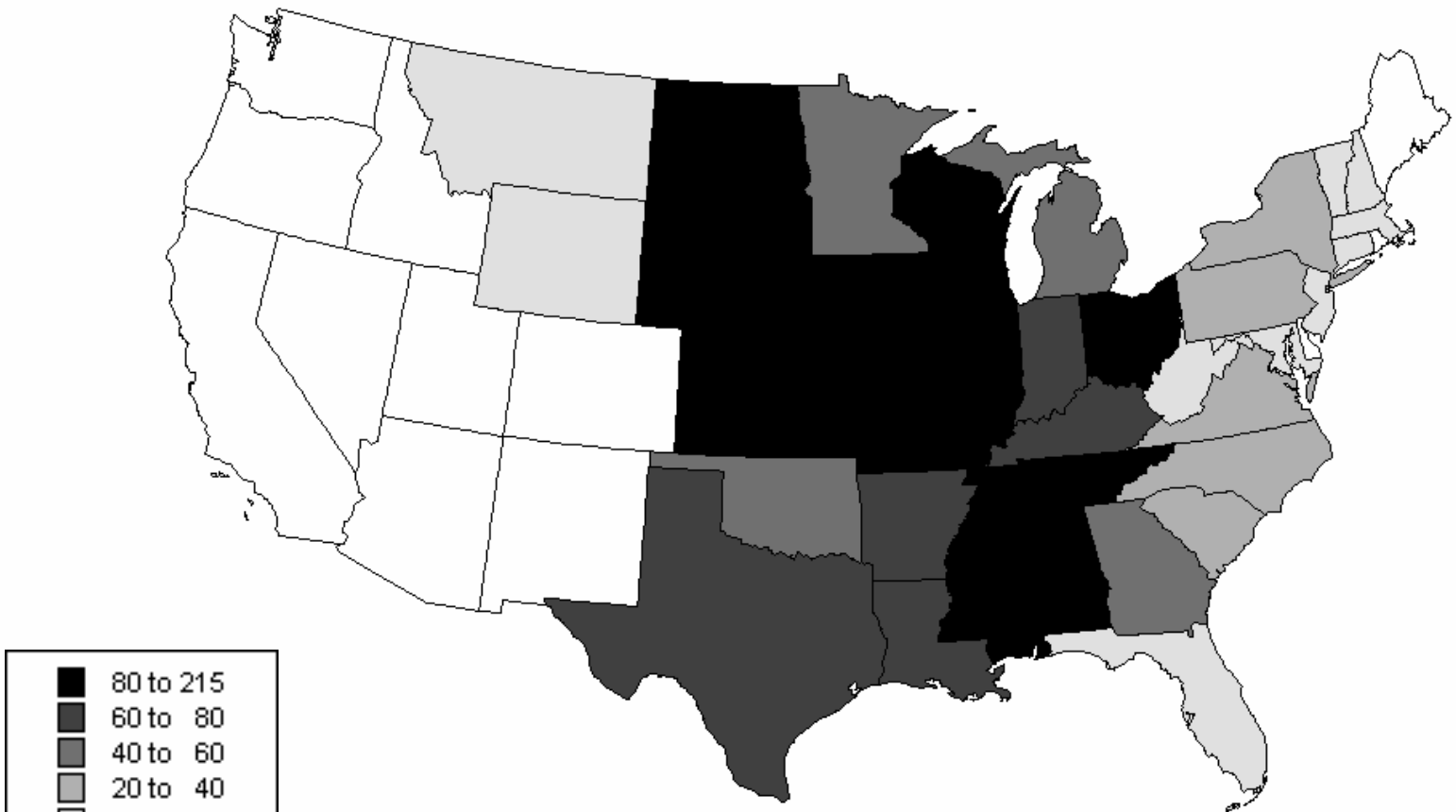
Production Management Scenario
Change in Income, 2008



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What If …

- Bioenergy dedicated crops were in wide spread production since 1996

- What would have been the impact in crop returns

-What would have been the impact in government expenditures

-Use $30 and $40 x dton of switchgrass as farm gate price.

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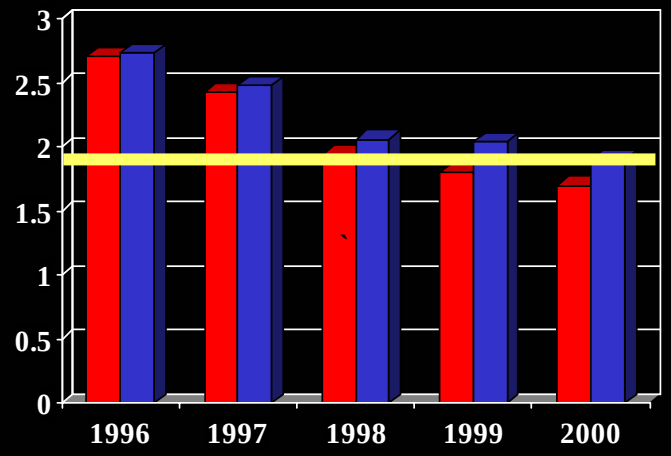
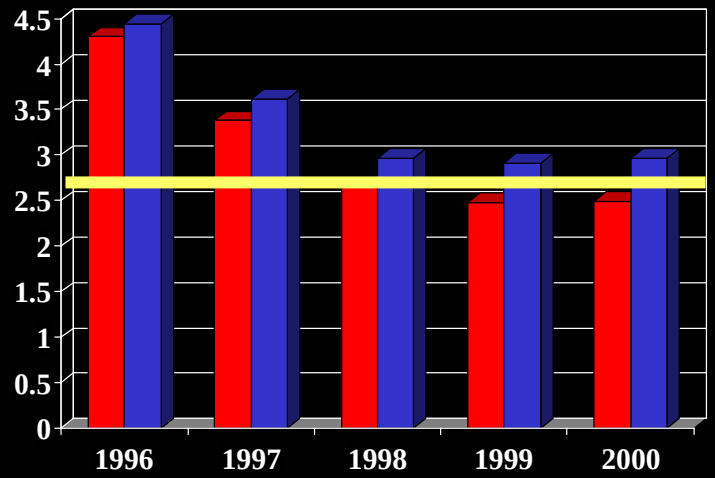
Changes in Crop Prices

Using history and $40 switchgrass

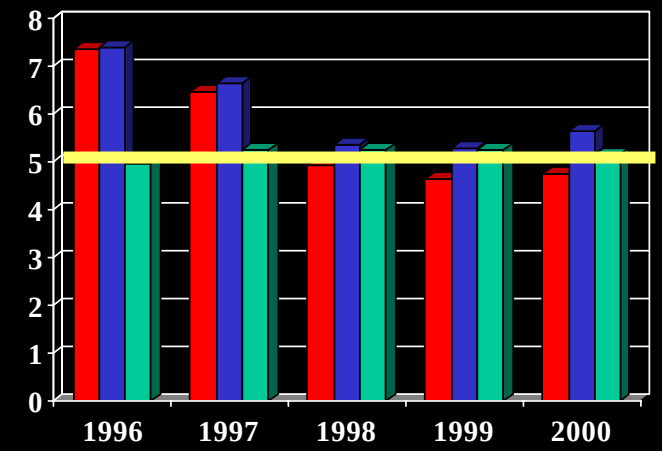
corn



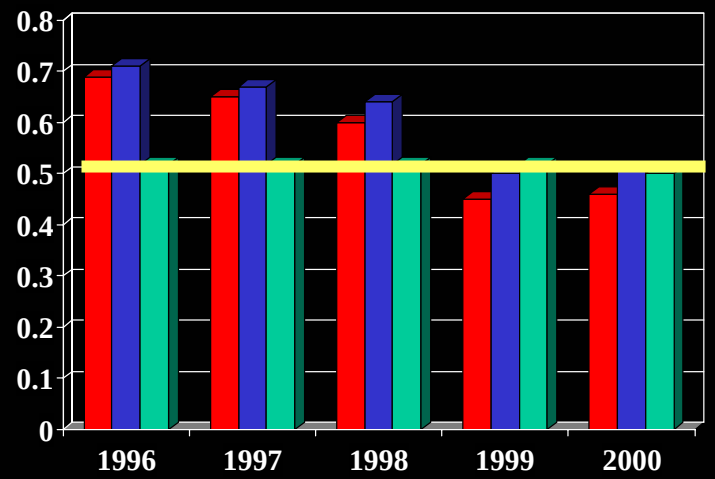
wheat



soybeans



cotton



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Comparing Actual vs What If
Annual Average 1996-2000

		Actual	Bioenergy Scenario	
			$30xdton	$40xdton
Switchgrass Acreage	mil. acres	-	9.42	22.23
Market Returns	mil. $	21,547	22,579	25,102
Loan Defficiency Payments	mil. $	1,888	759	39
Emergency Payments	mil. $	3,903	3,903	3,903
Returns from Bioenergy Crops	mil. $	-	66	657
Total Returns	mil. $	27,338	27,307	29,701

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Bottom Line

Annual Average 1996-2000

	Bioenergy Scenario	
	$30xdt	$40xdt
Government Savings (mil $)	1,129	1,849
Change in Total Returns (mil $)	(30)	2,363
Potential SubsidySwitchgrass ($/dt)	23	45

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Closing

- Production of bioenergy dedicated crops would have wide regional impacts in agricultural sector.

- Ample opportunities for synergism between energy and agricultural policies.

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