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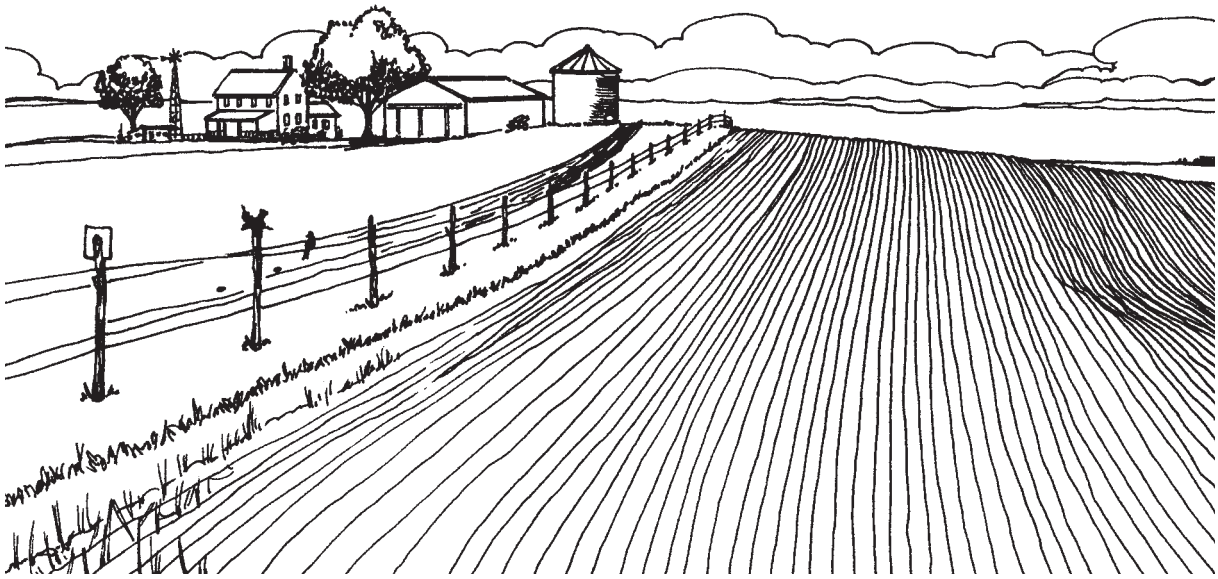
Agricultural Land and Water Use in Mississippi, 1982-1998



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Introduction

Reliable and accurate data are needed regularly to track trends in agriculture and forestry. Three national databases commonly used for this are the USDA-Forest Service's (FS) Forest Inventory and Analysis (FIA), USDA-National Agricultural Statistics Service's (NASS) Census of Agriculture, and the USDA-Natural Resources Conservation Service's (NRCS) National Resources Inventory (NRI). The purpose of this bulletin is to report trends in the uses of the soil and water resources for agriculture and forestry in Mississippi from 1982 to 1998 and evaluate factors affecting management of these resources.

Agriculture and forestry have played a major role in Mississippi's history. When the state was first settled, people relied upon the abundant natural resources for food and shelter. In 1999, it was estimated that one of every five employees in the state had a job related to agricultural or forestry products (USDA-ERS, 1999).

As people migrate from farms to factories, attention has been given to maintaining a reliable supply of food and clean water. Efforts to ensure a reliable food supply have been taken at the national, state, and local levels. The United States Congress has passed various legislation such as the 1985 Food Security Act, which paid landowners to remove highly erodible land (HEL) from production. Land-grant universities have conducted research focused on increasing production while reducing inputs and expenses. At the county level, extension agents and district conservationists provide technical assistance so that land managers may become more efficient and protect the land and water resource base.

Methodology

Forest Inventory and Analysis (FIA)

The USDA-FS Research and Development Division conducts the FIA. State forestry agencies and private landowners assist the FS with data collection. The purpose of the FIA is to collect data and report on the status and trends in forested areas and locations on all lands (federal, state, county, and private). Data are collected for tree species, size, health, growth, mortality, harvest, and land ownership.

Surveys consist of three phases. Phase 1 uses remote sensing to classify land as forested or nonforested areas. Advances such as satellite imagery are replacing aerial photography for determinations. In Phase 2, a plot is established every 6,000 acres across the landscape. Field crews visit each forested plot to collect inventory data. Nonforest sites are also visited to note land use changes. Phase 3 is conducted during the growing season in a subset of Phase 2 plots to collect data on vegetative inventory, tree condition, and soil.

For this report, only data for acres by ownership and type group were analyzed. Trends in timber production were not included.

Census of Agriculture

Since 1840, the Census of Agriculture has provided information on county, state, and national agricultural production. Uses of the data include implementing farm program policies by Congress, as well as allocating funding for extension service programs, agricultural research, and land-grant universities. Census data provides private industry with the information necessary to increase production and distribution.

Required by law, the census is conducted on a 5-year cycle for years ending in 2 and 7. It includes all 50

states, Puerto Rico, Guam, the U.S. Virgin Islands, and the Northern Mariana Islands.

In 1988, 1994, and 1998, NASS conducted special irrigation surveys that provided more detailed information on irrigation than the 1987, 1992, and 1997 censuses.

National Resources Inventory (NRI)

The Rural Development Act of 1972 and the Soil and Water Resources Conservation Act of 1977 directed NRCS to collect natural resources data. The purpose of these and other acts was to assess the status, condition, and trends of soil and water, which includes land cover and use, soil erosion, prime farmland, habitat diversity, wetlands, selected conservation practices, and related resources on the nation's nonfederal lands. Information is collected at more than 800,000 statistically selected sites covering all 50 states, Puerto Rico, the U.S. Virgin Islands, and some Pacific Basin locations. Data are available from 1982-1997 at 5-year intervals for each sampling location. The NRI is designed to produce statistically reliable data at the national, regional, state, and multicounty levels.

Almost all information for the 1982 NRI was gathered by on-site visits. In 1987, remote sensing provided 30% of the data. As technical advances were made in data collection, the agency relied almost entirely upon remote sensing for the 1992 and 1997 data.

Soil erosion was calculated by using the Universal Soil Loss Equation (USLE) on cropland, pasture, and CRP. Cover factor (C-factor) in the USLE was determined by the 4-year rotation for each cropland or CRP NRI point.

Carbon Sequestration

Environmental Policy Integrated Climate (EPIC) (Version EPIC8120) (USDA-ARS, 1990) was used to estimate carbon sequestration by corn, cotton, and soybean grown with three tillage systems and CRP cover practices.

Queries from the NRI were made to determine the dominant soil within each Major Land Resource Area (MLRA) (USDA-SCS, 1981) with the most acres under cultivation. Average slope and slope length were also calculated for each MLRA. Erosion control factor (P) was 1.0 for all EPIC runs.

Weather stations for the MLRAs were located at Moorhead (Delta – MLRA 131), Canton (Brown Loam – MLRA 134; and Coastal Plain – MLRA 133A), and Starkville (Blackland Prairie – MLRA 135). Weather sequence was constant for each tillage system and CRP cover practice within each MLRA.

Table 1. Tillage operations for corn, cotton, and soybean to estimate carbon sequestration, by Major Land Resource Area and tillage system.

Crop	Delta	Brown Loam and Coastal Plain	Blackland Prairie
		Conventional Tillage	
Corn and cotton	Subsoil Hip Harrow Plant Cultivate twice	Chisel Disk twice Hip Harrow Plant Cultivate twice	Harrow Plant Cultivate twice Fall hip twice
Soybean	Chisel Disk twice Harrow Plant Cultivate twice	Chisel Disk twice Harrow Plant Cultivate twice	Chisel Disk twice Harrow Plant Cultivate twice
		Reduced Tillage	
Corn, cotton, and soybean	Harrow Plant Cultivate	Harrow Plant Cultivate	Harrow Plant Cultivate
		No-Till	
Corn, cotton, and soybean	Plant	Plant	Plant

Tillage systems for corn (*Zea mays* L.), cotton (*Gossypium hirsutum* L.), and soybean [*Glycine max* (L.) Merr.] in the Delta, Brown Loam, Coastal Plain, and Blackland Prairie were conventional, reduced, and no-till. Tillage operations by tillage system for each crop and MLRA are shown in Table 1. Automatic heat unit scheduling and fertilizer applications in EPIC were used to determine when operations were performed instead of specific dates. Simulation runs were for 6 years with the first year's data omitted in the analysis. Changes in soil organic carbon in the top layer were calculated as the difference between the second and sixth year.

Soil series, average slope and slope length within each MLRA with the most acres enrolled in the CRP were determined from the NRI. Plant species used in EPIC for the three recorded CRP cover practice were bermudagrass (*Cynodon dactylon* L. Pers.) (grass and legumes), pine (*Pinus* spp.) (trees), and switchgrass (*Panicum virgatum* L.) (wildlife and components). These were the predominant species planted during the latest signup periods.

Conventionally tilled soybean was grown for 2 years before establishing each CRP cover practice. Bermudagrass and switchgrass were planted into a prepared seedbed. Two scenarios were simulated for each grass cover practice: land cover and biofuel production. Amount of carbon sequestered by each cover practice was the difference in soil carbon between the last year planted in soybean and at the end of the 10-year period. To evaluate each cover as a biofuel source, grasses were harvested (July 6 and October 1 of each year). Fertilizer was applied annually on April 15 (500 pounds of 13-13-13 per acre) and July 7 (180 pounds of 34-0-0 per acre). Grasses for CRP cover were shredded July 1 of years 2 to 10. Pine trees were clear cut December 31 of the last year, and soil carbon sequestered was determine by the same method as the grasses.

DISCUSSION

Farm Characteristics

The total number of farms in Mississippi has decreased by more than 11,000 since 1982 (Table 2). In 1982, 11 counties in the state had at least 751 farms each; however, by 1997, only Jones County had more than 750 farms. Only two counties (George and Jackson) showed an increase in farm number during this time. Most of the decrease in farm number for Yazoo and Holmes counties and the increase for George and Jackson counties occurred from 1992 to 1997. Percent of farms owned by individuals, families, or family corporations has remained above 90% since 1982. As the number of farms decreased since 1982, average age of farm operators increased from 52 to 56 years. In addition, percent of operators with farming as principal occupation decreased from 71.7% in 1982 to 40.7% in 1997.

In 1982, eight counties had total farm acreage of 275,000 or more (data not shown). By 1997, this number had decreased to five counties. In the 175,000 to 275,000 total farm acres range, the number of counties decreased from 14 to 10. Losses in 80 of the 82 counties led to the total decrease of more than 2 million acres in farms for the 1982-1997 period (Table 2). During 1982-1997, Jackson County gained 3,145 acres, while Hinds lost 114,099 acres of total farmland.

Although number of farms and land in farms decreased from 1982 to 1997, average farm size increased by 30 acres (Table 2). In 1997, counties in the Delta had the highest average farm size, while counties in the southeast tended to have the smallest. Tunica County had the highest average farm size (2,132 acres), while Harrison County had the smallest (65 acres). Tunica also had the highest increase in farm size from 1992 (792 acres), and Adams County had the largest decrease (-60 acres).

Table 2. Number of farms, total acres in farms, and average farm size in Mississippi, 1982-1997.[1]

Year	No. farms	Total acres	Avg. size
1982	42,415	12,421,651	293
1987	34,074	10,746,190	315
1992	31,998	10,188,362	318
1997	31,318	10,124,822	323

[1]Source: 1997 Census of Agriculture.

Table 3. Broadland use and ownership of land and water surfaces in Mississippi, 1982-1997 (thousands of acres).

Broadland use	Year	Ownership							Totals
		Private	Municipal	County	State	Federal	Tribal/Trust	Water	
Cultivated cropland	1982	7,092.3	5.0	50.5	48.2	—	—	—	7,196.0
	1987	6,420.4	2.0	46.8	39.4	—	—	—	6,508.6
	1992	5,406.6	0.9	43.5	30.7	—	—	—	5,481.7
	1997	4,857.7	0.9	46.0	26.9	—	—	—	4,931.5
Noncultivated cropland	1982	206.4	—	3.6	10.0	—	—	—	220.0
	1987	153.2	—	1.3	1.9	—	—	—	156.4
	1992	243.2	—	1.3	—	—	—	—	244.5
	1997	415.3	3.0	1.3	1.3	—	—	—	420.9
Pastureland	1982	3,904.7	—	34.4	50.2	—	—	—	3,989.3
	1987	3,810.3	—	35.2	45.2	—	—	—	3,890.7
	1992	3,854.3	—	34.3	43.5	—	—	—	3,932.1
	1997	3,607.1	—	29.9	42.3	—	—	—	3,679.3
Forestland	1982	14,822.1	11.0	207.7	259.2	—	19.0	—	15,319.0
	1987	15,165.7	16.0	217.1	276.7	—	18.8	—	15,694.3
	1992	15,376.4	14.2	227.1	279.7	—	18.4	—	15,915.8
	1997	15,637.7	14.4	243.4	295.1	—	18.2	—	16,208.8
Minor land	1982	271.6	—	8.3	47.8	—	—	—	327.7
	1987	270.0	—	8.6	48.8	—	—	—	327.4
	1992	268.6	—	8.4	48.8	—	—	—	325.8
	1997	331.3	—	7.4	50.6	—	—	—	389.3
Urban / built-up	1982	559.2	60.5	22.5	15.2	—	—	—	657.4
	1987	614.1	65.4	24.0	20.5	—	—	—	724.0
	1992	681.0	61.7	24.8	27.3	—	—	—	794.8
	1997	856.4	76.3	30.5	28.5	—	—	—	991.7
Rural transportation	1982	296.9	0.2	69.0	96.7	—	—	—	462.8
	1987	309.4	0.2	62.7	96.8	—	—	—	469.1
	1992	312.0	0.2	61.8	98.8	—	—	—	472.8
	1997	316.2	0.2	66.9	99.0	—	—	—	482.3
Small water	1982	—	—	—	—	—	—	379.9	379.9
	1987	—	—	—	—	—	—	435.9	435.9
	1992	—	—	—	—	—	—	473.0	473.0
	1997	—	—	—	—	—	—	498.2	498.2
Census water	1982	—	—	—	—	—	—	340.6	340.6
	1987	—	—	—	—	—	—	355.5	355.5
	1992	—	—	—	—	—	—	356.8	356.8
	1997	—	—	—	—	—	—	356.8	356.8
Federal land	1982	—	—	—	—	1,634.6	—	—	1,634.6
	1987	—	—	—	—	1,673.5	—	—	1,673.5
	1992	—	—	—	—	1,751.9	—	—	1,751.9
	1997	—	—	—	—	1,769.7	—	—	1,769.7
CRP land	1982	—	—	—	—	—	—	—	—
	1987	290.6	—	1.3	—	—	—	—	291.9
	1992	773.3	—	3.0	1.8	—	—	—	778.1
	1997	794.0	—	3.0	1.8	—	—	—	798.8
Totals	**1982**	**27,153.2**	**76.7**	**396.0**	**527.3**	**1,634.6**	**19.0**	**720.5**	**30,527.3**
	1987	**27,033.7**	**83.6**	**397.0**	**529.3**	**1,673.5**	**18.8**	**791.4**	**30,527.3**
	1992	**26,915.4**	**77.0**	**404.2**	**530.6**	**1,751.9**	**18.4**	**829.8**	**30,527.3**
	1997	**26,815.7**	**94.8**	**428.4**	**545.5**	**1,769.7**	**18.2**	**855.0**	**30,527.3**

Broadland Use

Broadland use is defined as the general use of land and water surfaces. For the 1997 NRI, 12 categories used were cultivated cropland, uncultivated cropland, pasture, rangeland, forestland, minor land, urban land, rural transportation, small water areas, census water, federal land, and Conservation Reserve Program (CRP).

Forestland – Dominant broadland use in Mississippi is forestland, with more than 16 million acres in 1997 (Table 3). This is an increase of 889,800 acres from 1982. Since the NRI tracks broadland use only on nonfederal lands, forestland owned by the federal government is not separated from that in the federal broadland use. Therefore, the FIA provides more forestland data than the NRI. The FIA estimated that 1.534 million acres in the state were federal forestland in 1997 (Table 4). Since the FIA and NRI use different methods of estimating acreage, total figures from both are not expected to be equal.

Most of forestland was owned by the private sector (Tables 3 and 4). In 1997, nonindustrial private entities owned 80% and the forest industry owned 20% of the private forestland (Table 4). Of the eight states in the South Central Region of the U.S. Forest Service, Mississippi had the third highest acreage, behind Texas and Tennessee, of privately owned forestland in 1997. Excluding the oak-pine (*Quercus spp. - Pinus spp.*)

Table 4. Forestland acres by ownership and forest type group in Mississippi, 1987-1997 (thousands of acres).[1]

Forest type group	Year	Public ownership			Private ownership		All owners
		Federal	State	County and municipal	Forest industry	Nonindustrial	
Longleaf-slash pine	1987	213	20	22	301	496	1,052
	1992	187	25	5	261	351	829
	1997	195	31	11	226	402	865
Loblolly-shortleaf pine	1987	484	42	24	867	2,794	4,211
	1992	349	67	13	1,059	2,439	3,927
	1997	371	87	6	1,314	3,107	4,885
Oak-pine	1987	333	4	31	621	2,462	3,451
	1992	355	47	37	701	2,334	3,474
	1997	359	35	39	510	2,278	3,221
Oak-hickory	1987	198	11	21	468	3,666	4,364
	1992	301	65	23	747	4,388	5,524
	1997	263	61	15	581	4,916	5,836
Oak-gum-cypress	1987	249	23	22	552	2,605	3,451
	1992	272	49	36	468	2,228	3,053
	1997	307	91	22	575	2,568	3,563
Elm-ash-cottonwood	1987	20	0	11	43	73	147
	1992	15	5	0	10	108	138
	1997	14	5	0	21	110	150
Nonstocked [2]	1987	0	0	0	12	6	18
	1992	18	0	0	21	11	50
	1997	25	0	5	12	31	73
Unknown	1987	0	0	0	0	0	0
	1992	3	0	0	0	0	3
	1997	1	0	0	0	0	1
Totals	**1987**	**1,496**	**100**	**132**	**2,864**	**12,102**	**16,694**
	1992	**1,501**	**258**	**115**	**3,267**	**11,859**	**17,000**
	1997	**1,534**	**311**	**100**	**3,241**	**13,411**	**18,597**

[1]Source: U.S. Forest Service 1997 Forest Inventory and Analysis. Some totals may not add exactly due to rounding.
[2]Nonstocked: timberland less than 10% stocked with all live trees.

type group, Mississippi has more acres of hardwoods than pine. Number of acres of loblolly (*Pinus taeda*) and shortleaf (*Pinus echinata*) pine increased on private lands and decreased on federal lands from 1987 to 1997. Daniels (2000) reported that the annual value of timber harvested in Mississippi increased from $737 million in 1990 to $1.3 billion in 1999.

Cropland – Cropland, cultivated and noncultivated, comprised more than 5 million acres in the state in 1997 (Table 3). Acres of noncultivated cropland almost doubled from 1982, while acres of cultivated cropland decreased 31.5% (2,264,500 acres). Part of this decrease (11%) was attributed to the CRP.

Urbanization – Urban and built-up land acreage increased by 196,900 acres from 1992 to 1997 (Table 3). Nationally, Mississippi ranked 22nd for acres developed during this period and 27th from 1982 to 1997. Most of this amount was from pasture (37,500 acres) and soybean (13,100 acres) (Table 5). Cropland under irrigation in 1992 and developed by 1997 totaled 4,500 acres, with most of this from cotton (2,000 acres) (Table 5).

Since 1982, privately owned land has averaged 88% of the total acres. However, privately owned land has decreased slightly since 1982, while that owned by the federal government (from 5.4% to 5.8%) and that classified as water has increased slightly. Because determining ownership of water is often difficult, the NRI does not determine ownership of water bodies. Therefore, the broadland use for water was created.

Land Use

Acres by selected land use are presented in Table 6. Top five land use categories were ungrazed forestland, pasture, hay land, soybean, grazed forestland, and cotton.

Catfish (*Ictalurus punctatus*) pond acreage increased from 26,800 in 1982 to 76,100 in 1997 (data not shown). In 1997, Mississippi ranked first in catfish production in number of farms, pounds produced, and total sales. Total sales ($256.2 million) were more than half of the national total.

Soybean, cotton, hay (all types), and corn were the major cultivated cropland in Mississippi for 1997 (Table 6). Hay land-grass showed a 70.5% increase in acreage, while sorghum [*Sorghum bicolor* (L.) Moench] showed a 58.7% decrease from 1992 to 1997. Nationally, Mississippi ranked fourth in 1997 for cotton acreage and bales produced. Washington, Coahoma, Leflore, and Tallahatchie counties were in the top 30 counties nationally for bales produced and in the top 50 counties for acres harvested. For soybean, Mississippi

Table 5. Total and irrigated acres developed by 1997 in Mississippi from agriculture and forestry production in 1982, 1987, and 1992 (thousands of acres).[1]

Land use	1982		1987		1992		1982-1992	
	Total	Irrigated	Total	Irrigated	Total	Irrigated	Total	Irrigated
Nut	0.6	—	0.6	—	0.4	—	1.6	—
Corn	6.9	—	3.7	—	2.5	—	13.1	—
Sorghum	0.8	—	1.4	—	0.2	—	2.4	—
Soybean	43.5	0.4	23.9	2.1	13.1	0.9	80.5	3.4
Cotton	12.3	0.3	9.3	2.1	8.3	2.0	29.9	4.4
Potato [2]	0.1	—	0.1	—	—	—	0.2	—
Other vegetables [2]	2.6	—	0.9	—	0.8	—	4.3	—
Wheat	2.0	—	3.2	—	1.2	—	6.4	—
Rice	1.9	1.9	0.4	0.4	0.7	0.7	3.0	3.0
Other close grown [2]	1.3	—	—	—	0.4	—	1.7	—
Hay land - grass	4.7	—	5.7	—	1.1	—	11.5	—
Hay land - legume	0.1	—	—	—	0.1	—	0.2	—
Hay land - grass & legume	0.2	—	—	—	0.1	—	0.3	—
Other - not planted	11.2	—	11.3	—	8.1	0.9	30.6	0.9
Pasture - grass	69.1	—	54.4	—	37.5	—	161.0	—
Pasture - grass, forbs, & legume	13.7	—	12.7	—	7.8	—	34.2	—
Forestland - grazed	27.0	—	21.6	—	11.0	—	59.6	—
Forestland - ungrazed	167.3	—	142.4	—	110.9	—	420.6	—
CRP land	—	—	0.3	—	0.3	—	0.6	—
Totals	**365.3**	**2.6**	**291.9**	**4.6**	**204.5**	**4.5**	**861.7**	**11.7**

[1]Source: 1997 NRI.
[2]Potato – does not include sweetpotato; other vegetables – melons, carrots, celery, etc.; other close grown – castorbean, kenaf, sugar cane, etc.

ranked 12th for bushels produced and 11th for acres harvested. Bolivar County ranked 15th and ninth for production and acreage, respectively. For rice (*Oryza sativa* L.), the state ranked fifth in total acres and production, with Bolivar in the top 15 counties nationally.

With advances in technology and the need to decrease production expenses, farm operators have changed chemical and fertilizer practices. Percent of cropland acres treated with chemicals remained steady at approximately 80% (data not shown); however, percent of cropland receiving commercial fertilizer decreased since 1982 by 7% to 39.9%. Number of acres treated for control of insects, diseases, and weeds decreased, while the number of acres treated for nematodes increased. As pasture acreage decreased since 1982, acreage fertilized increased from 51.8% to 60.4% (data not shown).

From 1982 to 1997, total soil erosion was estimated to decrease from 61,377,989 tons to 31,871,347 tons. Average soil erosion per acre decreased from 5.2 tons per acre in 1982 to 3.1 tons per acre in 1997. Reduction in total soil erosion was attributed to the decrease in cropland acres. Multiple tillage trips usually associated with sweetpotato (*Solanum* spp.) (the NRI lists sweetpotato [*Ipomoea batatas* (L.) Lam.] in the other vegetables category) and vegetable production were attributed to the high soil erosion rates for these crops (Table 6).

Conservation Practices

Conservation practices such as terraces, filter strips, and grassed waterways help improve water quality by reducing the amount of sediment and attached pesticides reaching water bodies. Average use of fluometuron and norflurazon in Mississippi is among the highest in the nation (USGS, 1998). Research in the state has shown that filter strips can reduce loss of these compounds by at least 63% (Rankins et al., unpublished data). In another study, loss of metribuzin and metolachlor from runoff was less than 3% of the total

Table 6. Land use and annual soil erosion, by selected land use, in Mississippi, 1982-1997.[1]

Land use	1982		1987		1992		1997	
	Acres	Soil erosion	Acres	Soil erosion	Acres	Soil erosion	Acres	Soil erosion
	x1,000	*tons/A/yr*	*x1,000*	*tons/A/yr*	*x1,000*	*tons/A/yr*	*x1,000*	*tons/A/yr*
Fruit	—	—	1.7	0.0	1.7	1.4	—	—
Nut	32.3	0.42	40.8	0.4	38.9	0.4	46.0	0.7
Vineyard	5.1	10.93	—	—	5.1	0.9	5.1	0.9
Berries	—	—	1.2	0.2	1.2	0.2	—	—
Other horticultural crops [2]	10.7	6.71	4.5	0.1	4.5	2.3	4.3	0.1
Corn	251.5	10.35	205.3	11.1	301.9	8.3	419.3	6.1
Sorghum	77.5	12.35	157.1	8.0	81.5	6.7	33.6	5.7
Soybean	4,320.4	7.96	2,880.8	6.8	2,129.8	4.7	2,295.9	4.3
Cotton	1,368.2	7.77	1,404.9	8.1	1,581.7	8.2	1,280.4	7.9
Peanut	1.4	26.34	5.6	4.2	10.3	9.7	6.0	8.5
Potato [2]	7	5.32	1.4	14.9	—	—	21.9	7.4
Other vegetables [2]	52.8	20.34	32.9	17.9	39.8	13.4	28.8	13.0
Other row crops [2]	14	6.95	2.3	14.6	1.3	6.1	3.3	5.3
Sunflower	—	—	3.9	5.7	3.0	3.1	—	—
Wheat	300.7	6.62	212.1	5.4	149.6	4.7	106.6	4.3
Oats	10.7	6.65	5.2	0.8	4.1	4.5	—	—
Rice	315.4	1.92	233.9	2.9	345.8	2.3	239.1	2.3
Other close grown	19.8	16.11	13.2	13.1	32.1	9.7	34.8	9.3
Hay land - grass	173.3	3.07	187.8	2.9	228.6	1.8	389.8	1.4
Hay land - legume	8.4	13.8	7.3	10.6	11.0	4.1	3.1	2.7
Hay land - grass & legume	28.4	0.95	7.9	1.7	10.2	0.7	8.2	1.4
Summer fallow	22.8	6.48	13.0	3.4	3.9	5.3	14.8	3.5
Other - not planted	323	6.95	1,029.2	5.0	655.7	3.4	374.3	3.9
Pasture - grass	3,494	1.39	3,575.0	1.3	3,509.5	1.3	3,347.7	1.2
Pasture - legume	2.7	0.1	1.4	0.2	1.4	0.2	1.4	0.2
Pasture - grass, forbs, & legume	565.2	0.94	527.3	1.1	505.7	1.1	362.4	1.1
Forestland/grazed	1,879.3	—	1,564.6	—	1,433.4	—	1,149.4	—
Forestland/ungrazed	13,439.7	—	14,129.7	—	14,482.4	—	15,059.4	—
CRP land	—	—	291.9	4.4	778.1	2.6	798.8	1.1

[1]Source: 1997 NRI.
[2]Potato – does not include sweetpotato; other vegetables – melons, carrots, celery, etc.; other close grown – castorbean, kenaf, sugar cane, etc.

amount applied, or half that of the unfiltered check, when tall fescue (*Festuca arundinacea* Schreb.) was used as a filter strip (Tingle et al., 1998).

For the 1997 NRI, only those conservation practices identifiable by remote sensing were recorded. Acres treated with these practices in 1997 are shown in Table 7. Total acres cannot be summed by crop because more than one practice could be recorded at each point. In 1997, contour farming, terrace, and surface drainage-field ditch were the three practices that treated the most acres.

Conservation tillage – Conservation tillage (CT) (more than 30% residue after planting) has been shown to have agronomic, economic, and environmental benefits. However, land operators in Mississippi have planted only approximately 25% of cropland acres with CT from 1992 to 1997 (CTIC, 1997). Mississippi ranked 31st nationally in percentage of acres planted using CT and sixth in the Southeast.

More than half of double-cropped soybean crops were planted using CT from 1992 to 1997 (CTIC, 1997). Conservation tillage acres for corn, one of the crops easiest to grow with CT, were less than 30%. Research in the state has shown that highly erosive crops such as cotton (Stevens et al., 1992; Bloodworth and Johnson, 1995), peanut (*Arachis hypogea* L.) (Bloodworth and Lane, 1994), and sweetpotato (Bloodworth and Lane, 1994) can be successfully grown with CT. However, less than 9% of acres for these crops are planted using CT.

Carbon sequestration – Using the EPIC model to estimate carbon (C) sequestration, soybean in each MLRA sequestered the most C when compared with corn and cotton (Table 8). Low C-sequestration levels for corn and cotton were attributed to their high C:N ratio. Although a net gain in soil organic carbon (SOC) was not obtained with conservation tillage in all MLRAs, there was a trend toward a reduction in CO_2 release into the atmosphere. Data from Bloodworth and Johnson (1995) tend to support the EPIC results for cotton.

Table 7. Land managed with conservation practices in Mississippi, 1997 (thousands of acres).[1]

Crop	Contour farming	Field border	Filter strip	Grassed waterway	Strip cropping, contour	Strip cropping, field	Surface drainage, field ditch	Terrace
Corn	16.0	1.6	3.5	7.4	—	—	2.6	9.2
Sorghum	1.9	—	—	—	—	—	—	1.9
Soybeans	9.2	2.2	—	—	1.7	—	14.5	9.6
Cotton	11.4	—	—	4.8	1.3	4.8	15.3	15.6
Peanut	3.4	—	—	—	—	1.3	—	—
Other vegetables [2]	4.3	2.6	2.6	2.6	—	2.6	—	4.0
Wheat	11.2	—	—	1.4	—	—	—	1.0
Other close grown [2]	10.2	—	1.1	—	—	2.5	—	—
Grass - hay land	8.2	—	3.9	1.3	—	—	—	1.2
Summer fallow	—	—	—	—	—	—	—	1.5
Other - not planted	1.4	—	—	—	—	—	8.4	4.9
Grass - pasture	—	6.8	1.3	2.5	—	—	—	18.0
CRP land	—	—	1.7	—	—	—	—	—
Totals	**77.2**	**13.2**	**14.1**	**20.0**	**3.0**	**11.2**	**40.8**	**66.9**

[1]Source: 1997 NRI.
[2]Other vegetables – melons, carrots, celery, etc.; other close grown – castorbean, kenaf, and sugar cane, etc.

Table 8. Estimated amount of carbon sequestered for corn, cotton, and soybean grown with conventional, reduced, and no-till tillage systems after 5 years of EPIC simulations.[1]

Resource area	Soil	Soil depth	Corn			Cotton			Soybean		
			Conv.	Reduced	No-till	Conv.	Reduced	No-till	Conv.	Reduced	No-till
		ft	*tons/A*	*tons/A*	*tons/A*	*tons/A*	*tons/A*	*tons/A*	*tons/A*	*tons/A*	*tons/A*
Delta	Sharkey	0.26	0.47	0.58	0.60	-0.19	0.45	0.55	0.86	1.78	1.90
Brown Loam	Memphis	0.39	-0.15	-0.02	-0.08	-0.72	-0.15	-0.16	1.03	1.52	1.53
Coastal Plain	Smithdale	0.33	-0.21	0.20	0.19	-1.22	0.08	0.19	0.54	1.51	1.63
Blackland Prairie	Leeper	0.46	-0.10	0.11	-0.08	-0.20	0.01	-0.08	1.10	1.28	1.34

[1]EPIC: Environmental Policy Integrated Climate (USDA-ARS, 1990).

Crop Rotation

Crops are commonly grown in a rotation in order to reduce pest competition, improve soil conditions, and reduce soil erosion. To date, the NRI is the only statistically reliable national survey that records cropping history. For each inventory year, land cover use is recorded for the preceding 3 years, thus providing data for 4 years. A query was conducted from the 1997 NRI to determine acres in either a monoculture or a crop rotation cropping practice.

Acres and average soil erosion for each crop and cropping practice are presented in Table 9. Essentially all rice in Mississippi was in a 4-year crop rotation, while 78% of cotton was grown in a monoculture practice. Soybean acres were evenly split between the two practices. Soil erosion for each cultivated crop in a rotation tended to decrease except for rice (Table 9).

Land uses for corn, cotton, rice, sorghum, soybean, and wheat (*Triticum aestivum* L.) in a crop rotation for 1994 to 1997 are presented in Table 10. Corn is a popular rotation crop because it can be easily grown with CT, increase soil organic matter, and decrease soil erosion. Acreage of corn in 1997 rotated with either cotton, rice, or soybean tended to increase from 1994 to 1996. Acres classified as land not planted decreased during the 3 years before 1997 except for corn and sorghum. Soybean was the crop most commonly used in a rotation.

Conservation Reserve Program

In 1985, the U.S. Congress passed the Food Security Act, which contained provisions for the Conservation Reserve Program (CRP). The main purpose of the CRP was to encourage landowners to take HEL out of production in return for annual cash payments for 10 years. Land enrolled in CRP could have herbaceous, tree, or wildlife cover.

Highest acreage enrolled in CRP occurred in 1997 with 798,800 acres (Table 11). Mississippi ranked 16th nationally with acres in CRP and the Wetland Reserve Program. Trees were the most common cover in all inventory years.

Table 12 lists acres and soil erosion for each cropland use converted to CRP by 1997. From 1982 to 1992, more soybean acres were converted to CRP than any other crop.

Soil organic carbon – As estimated by EPIC, switchgrass increased SOC in all four MLRAs as compared with bermudagrass or pine (Table 13). This was attributed to a higher annual biomass yield (data not shown). Baer et al. (2000) found that total C (2 to 4 inch depth) did not increase after 10 years in CRP. They stated that 10 years was not long enough to restore total C to precultivation levels.

When land was managed for biofuel production, changes in SOC varied between land cover and MLRA (Table 13). Bermudagrass produced a higher simulated yield than pine or switchgrass. Edwards et al. (1999) reported similar results for bermudagrass and switchgrass. Economic data from EPIC estimated that total cost was 8.7 times higher for biofuel land management than for CRP (data not shown).

Land operators could void the CRP contract or when the contract expired use the acres for production. Table 14 shows the acres taken out of CRP, land use, and soil erosion.

Table 9. Acres and average annual soil loss for crops in a monoculture or 4-year crop rotation cropping practice in Mississippi, 1997.[1]

Crop	Monoculture		Crop rotation	
	Acres	Soil loss	Acres	Soil loss
	x1,000	*tons/A/yr*	*x1,000*	*tons/A/yr*
Corn	89.7	6.6	329.6	6.0
Sorghum	9.5	6.6	24.1	5.4
Soybean	1,151.4	4.5	1,144.5	4.0
Cotton	1,002.3	8.3	278.1	6.4
Wheat	21.2	6.8	85.4	3.6
Rice	3.7	1.8	235.4	2.3
Hay land	339.1	1.2	62	2.2
Summer fallow	4.4	3.7	10.4	3.5
Other cropland not planted	245.5	3.6	128.8	4.4
Pasture (all types)	3,617.2	1.2	94.3	1.4

[1]Source: 1997 NRI.

Table 10. Land area and average annual soil erosion for corn, cotton, rice, sorghum, soybean, and wheat in a 4-year rotation, 1994-1997.[1]

Rotation crop	Year	Corn in 1997		Sorghum in 1997		Soybean in 1997		Cotton in 1997		Wheat in 1997		Rice in 1997	
		Acres	Erosion	Acres	Erosion	Acres	Erosion	Acres	Erosion	Acres	Erosion	Acres	Erosion
		x1,000	*tons/A/yr*	*x1,000*	*tons/A/yr*	*x1,000*	*tons/A/yr*	*x1,000*	*tons/A/yr*	*x1,000*	*tons/A/yr*	*x1,000*	*tons/A/yr*
Corn	1994	120.2	6.2	3.7	5.8	126.0	6.7	122.6	5.6	6.5	4.3	4.3	3.8
	1995	150.3	7.9	—	—	112.3	4.7	117.3	5.6	13.9	4.5	5.1	2.8
	1996	213.5	5.8	—	—	100.3	7.4	79.2	5.6	7.5	3.9	—	—
Sorghum	1994	—	—	10.8	6.6	13.3	3.5	5.2	9.4	1.3	5.4	—	—
	1995	—	—	16.3	5.6	7.9	3.7	7.9	7.9	1.5	5.2	—	—
	1996	—	—	12.3	5.9	12.0	3.7	6.5	8.9	1.3	5.4	—	—
Soybean	1994	68.2	5.0	25.2	3.6	1,583.5	4.3	200.8	5.2	35.2	3.7	202.2	2.9
	1995	75.2	4.9	20.2	5.2	1,642.0	4.2	240.0	5.2	35.1	3.1	135.6	3.1
	1996	150.2	4.7	31.9	5.2	1,688.2	4.3	153.0	4.9	37.4	4.4	182.3	2.8
Cotton	1994	23.3	6.2	8.3	8.7	145.7	5.4	1,067.0	8.3	5.0	6.9	10.8	4.7
	1995	27.5	8.2	4.8	6.6	76.8	5.3	1,151.2	8.1	2.6	3.0	4.3	3.7
	1996	45.5	8.8	1.2	10.3	64.0	6.8	1,154.9	7.9	7.9	4.9	5.2	5.3
Wheat	1994	9.3	5.2	—	—	42.0	3.6	5.9	3.5	29	5.8	8.9	2.8
	1995	1.9	4.7	—	—	53.5	3.8	3.4	3.1	33	5.4	7.8	3.1
	1996	4.9	4.9	2.6	4.4	52.8	3.7	2.1	3.9	36	5.2	2.6	3.9
Rice	1994	2.5	2.0	—	—	146.0	2.2	11.0	3.2	5.1	2.6	64.1	2.5
	1995	4.4	3.4	—	—	58.8	2.6	7.5	2.4	13.2	2.7	152.6	2.2
	1996	8.3	3.2	1.2	2.4	174.3	2.3	5.4	2.5	10.3	2.3	30.5	2.6
Hay land	1994	5.5	3.7	—	—	10.4	2.6	3.0	1.6	1.1	0.1	—	—
	1995	6.9	2.7	—	—	6.1	2.2	1.2	1.8	1.4	0.3	1.8	1.4
	1996	2.9	4.2	—	—	3.4	1.0	—	—	3.9	1.0	—	—
Summer fallow	1994	—	—	—	—	4.3	2.7	2.9	5.9	—	—	—	—
	1995	—	—	—	—	6.0	2.5	2.9	5.9	—	—	—	—
	1996	2.6	2.4	—	—	1.7	3.2	2.9	5.9	—	—	—	—
Cropland not planted	1994	7.0	3.0	1.1	5.2	47.4	4.0	21.2	11.1	9.6	1.9	11.5	2.9
	1995	20.6	10.4	1.3	1.2	48.8	3.2	14.8	5.9	—	—	7.1	3.0
	1996	18.6	3.9	2.7	2.7	28.8	3.1	5.5	7.8	9.1	4.2	5.9	3.3
Pasture	1994	5.7	1.6	—	—	17.1	0.7	2.5	2.9	2.4	0.3	—	—
	1995	2.9	2.1	—	—	6.4	1.2	1.6	3.9	—	—	—	—
	1996	—	—	—	—	1.5	0.3	—	—	—	—	—	—

[1]Source: 1997 NRI.

Table 11. Land enrolled in the Conservation Reserve Program, by cover practice, Mississippi, 1992-1997 (thousands of acres).[1]

Cover practice	1992 Acres	1997 Acres
Grasses and legumes	309.5	300.7
Trees	426.0	462.8
Wildlife and components	42.6	35.3
Total	**778.1**	**798.8**

[1]Source: 1997 NRI.

Table 12. Acres and average annual soil erosion of land converted to the Conservation Reserve Program in Mississippi by 1997, 1982-1992.[1]

Land use	1982		1987		1992	
	Acres	Soil loss	Acres	Soil loss	Acres	Soil loss
	x1,000	*tons/A/yr*	*x1,000*	*tons/A/yr*	*x1,000*	*tons/A/yr*
Corn	16.1	16.59	13.1	13.06	2	6.64
Sorghum	14.2	23.51	10	6.17	—	—
Soybean	529.1	15.55	252.6	11.96	23.5	12.76
Cotton	51.3	10.57	61.4	12.62	21.1	8.47
Potato	2.6	3.95	—	—	—	—
Other vegetable crops	0.5	6.69	1.2	6.75	—	—
Other row crops	3.3	12.28	1.3	7.81	—	—
Sunflower	—	—	2.5	5.97	—	—
Wheat	23	13.49	17.2	10.48	—	—
Oats	0.8	4.57	—	—	—	—
Rice	0.4	1.66	—	—	—	—
Other close grown	5.7	18.14	3.3	24.16	—	—
Hayland - grass	17.2	4.52	12.4	3.18	1.5	1.29
Summer fallow	5.8	5.14	6.1	3.74	—	—
Other cropland not planted	20.6	13.39	83.7	6.47	17.9	4.37
Pasture - grass	68.9	1.96	61.8	3.02	11.6	1.49
Pasture - grass, forbs, & legume	7.1	0.27	11.8	2.21	3.8	5.39
Forest - grazed	4.4	0	2.7	0	—	—
Forest - ungrazed	17.4	0	4.9	0	—	—
CRP land [2]	—	—	251.7	4.65	716.7	2.56

[1]Source: 1997 NRI.
[2]Land classified as CRP in 1997.

Table 13. Change in soil organic carbon (SOC) and average annual yield as a biofuel source of three Conservation Reserve Program (CRP) land covers after 10 years by Major Land Resource Area (MLRA).[1]

MLRA	Soil	Soil depth	CRP land – change in SOC	Biofuel production land	
				Change in SOC	Avg. annual yield
		ft	*ton/A*	*ton/A*	*ton/A*
			Grasses and Legumes [2]		
Delta	Forestdale	0.49	0.8	0.1	7.2
Brown Loam	Loring	0.30	-0.7	-0.3	7.8
Blackland Prairie	Okolona	0.32	-1.2	0.7	8.0
Coastal Plain	Providence	0.30	-0.3	-0.2	7.8
			Trees [2]		
Delta	Alligator	0.30	-0.8	-0.8	1.7
Brown Loam	Loring	0.30	-1.9	-1.9	1.8
Blackland Prairie	Vaiden	0.32	-1.3	-1.3	1.7
Coastal Plain	Ruston	0.30	-0.9	-0.9	1.9
			Wildlife Combination [2]		
Delta	Alligator	0.30	4.4	0.9	4.6
Brown Loam	Memphis	0.36	0.7	-0.8	5.8
Blackland Prairie	Okolona	0.32	4.6	0.7	5.6
Coastal Plain	Providence	0.30	0.8	0.9	5.7

[1]Estimated by Environmental Policy Integrated Climate,
[2]Grasses and legumes – bermudagrass; trees – pine; wildlife combination – switchgrass.

Table 14. Acres and average annual soil erosion on land once enrolled in the Conservation Reserve Program but reverted to cropland use, 1997.[1]

Crop	CRP in 1987		CRP in 1992	
	Acres	Erosion in 1997	Acres	Erosion in 1997
	x1,000	*tons/A/yr*	*x1,000*	*tons/A/yr*
Soybean	2.3	5.3	2.3	5.3
Cotton	—	—	0.9	4.5
Hay land (all types)	2.7	0.1	2.7	0.1
Pasture (all types)	8.7	0.2	20.7	0.3
Forest/ungrazed	26.2	—	34.5	—

[1]Source: 1997 NRI.

Irrigation

Mississippi was ranked 14th nationally for total land under irrigation. Nationally, counties ranked with the largest acreage of irrigated cropland were Bolivar (32nd) and Sunflower (89th). In 1997, Washington County went from being ranked 131st to 91st for irrigated *harvested* cropland, while Bolivar County went from 72nd to 27th. Although irrigated acres increased from 1992 to 1997 (Table 15), the number of farms irrigating decreased from 2,127 to 1,769.

Other than rice, crops with the largest number of acres irrigated were soybean, cotton, and wheat in 1997 (Table 15). Wells were the predominant water source, while the combination of pressure and gravity flow was the most common type of irrigation (data not shown).

Although irrigation may reduce economic risk, it is an expensive investment. In 1998, Mississippi landowners spent $16,585,000 on energy expenses for an average of $15.06 per acre. Propane/butane was the cheapest energy source ($12.13 per acre), while gasoline was the highest ($49.38 per acre). Of the farms investing in irrigation during 1998, 168 farms deepened wells, and 182 farms cleared and/or leveled land, but only two bought computers for water management. Of the 1,145 farms surveyed by NASS as to the method used in deciding when to irrigate, more than one option could be reported, 77 used moisture-sensing devices, 19 used commercial scheduling services, and 16 used computer software. Almost all operators listed visual condition of crop as a method in deciding when to apply water.

Table 15. Irrigated acres on selected cropland uses, by irrigation source, in Mississippi, 1982-1997 (thousands of acres).[1]

Cropland use	Year	Well	Pond, lake, reservoir	Stream, ditch, canal	Combination	Totals
Corn	1982	—	—	—	—	—
	1987	—	—	—	—	—
	1992	9.9	—	—	—	9.9
	1997	64.3	—	—	3.8	68.1
Cotton	1982	62.7	—	—	—	62.7
	1987	157.8	—	—	3.8	161.6
	1992	270.6	—	1.3	5.1	277.0
	1997	207.3	—	2.5	—	209.8
Hay	1982	1.3	—	—	—	1.3
	1987	1.1	—	1.4	—	2.5
	1992	—	—	—	—	—
	1997	2.5	—	—	—	2.5
Other vegetables [2]	1982	—	—	—	—	—
	1987	2.3	—	—	—	2.3
	1992	3.4	—	—	—	3.4
	1997	1.0	2.6	—	—	3.6
Rice	1982	305.1	—	6.4	3.9	315.4
	1987	224.9	—	9.0	—	233.9
	1992	335.8	—	3.6	6.4	345.8
	1997	232.8	—	6.3	—	239.1
Sorghum	1982	—	—	—	—	—
	1987	11.5	—	1.3	—	12.8
	1992	8.5	—	—	—	8.5
	1997	2.7	—	—	—	2.7
Soybean	1982	241.3	3.0	1.4	—	245.7
	1987	398.3	3.0	2.7	3.8	407.8
	1992	415.6	—	6.7	2.8	425.1
	1997	622.2	1.3	13.6	6.7	643.8
Summer fallow	1982	—	—	—	—	—
	1987	—	—	—	—	—
	1992	2.6	—	—	—	2.6
	1997	5.1	—	—	—	5.1
Wheat	1982	43.2	—	—	—	43.2
	1987	36.2	—	1.8	—	38.0
	1992	18.3	—	1.3	—	19.6
	1997	23.9	—	—	3.8	27.7
Totals	**1982**	**653.60**	**3.00**	**7.8**	**3.9**	**668.30**
	1987	**832.10**	**3.00**	**16.2**	**7.6**	**858.90**
	1992	**1,064.70**	**—**	**12.9**	**14.3**	**1,091.90**
	1997	**1,161.80**	**3.90**	**22.4**	**14.3**	**1,202.40**

[1]Source: 1997 NRI.
[2]Other vegetables – crops such as melons, carrots, celery, etc.

Table 16. Average yield of irrigated and nonirrigated crops and average amount of water applied in Mississippi, 1988-1998.[1]

Land use	Year	Unit	Yield		Average	Water use by irrigation type [2, 3]	
			Irrigated	Nonirrigated	water use [2]	Sprinkler only	Gravity flow only
Corn	1988	bu/A	124	59	0.8	0.9	0.8
	1994	bu/A	125	141	0.5	0.5	0.6
	1998	bu/A	121	93	0.8	0.7	0.8
Sorghum	1988	bu/A	85	58	0.5	0.4	0.6
	1994	bu/A	85	73	0.4	0.5	0.3
	1998	bu/A	76	74	0.5	(D)	(D)
Wheat	1988	bu/A	54	51	0.4	0.4	0.3
	1994	bu/A	56	44	0.5	0.4	(D)
	1998	bu/A	54	49	0.4	0.4	0.4
Soybean	1988	bu/A	36	23	0.8	0.7	0.9
	1994	bu/A	41	33	0.7	0.6	0.9
	1998	bu/A	35	20	0.8	0.9	0.9
Rice	1988	cwt/A	56	—	2.6	—	2.6
	1994	cwt/A	65	—	1.5	—	1.5
	1998	cwt/A	—	—	1.9	(D)	1.9
Cotton	1988	lb lint/A	1,028	842	0.7	0.6	0.8
	1994	lb lint/A	930	889	0.6	0.5	0.4
	1998	lb lint/A	876	746	0.7	0.6	0.6

[1]Source: Farm and Ranch Irrigation Survey, 1998.
[2]Measured in average acre-feet per acre.
[3](D) – Data withheld to avoid disclosing information on individual farms

Table 17. Characteristics of irrigation pumps for wells in Mississippi, 1988-1998.[1]

Item	Year	Pumping depth		
		<50	50-99	100-199
		ft	*ft*	*ft*
Farms	1988	203	1,084	140
	1994	136	731	60
	1998	117	843	88
Wells	1988	611	4,657	328
	1994	642	3,852	257
	1998	728	7,188	417
Avg. well depth (ft)	1988	92	140	189
	1994	90	110	142
	1998	81	112	136
Avg. depth to water (ft)	1988	21	32	43
	1994	21	34	60
	1998	24	37	52
Avg. pumping depth (ft)	1988	35	68	104
	1994	37	64	113
	1998	37	65	107

[1]Flowing or artesian well data are not included. Source: Farm and Ranch Irrigation Survey, 1998.

For most of Mississippi, growing conditions during 1998 were poor with high temperatures and little rainfall. Crops (corn, sorghum, wheat, soybean, rice, and cotton) were able to produce average yields, but most showed a response to irrigation (Table 16). Average amounts of water applied (sprinkler and gravity flow) are shown in Table 16.

While the number of farms with irrigation wells decreased from 1984 to 1998, the number of wells increased (Table 17). During this period, average well depth decreased with a slight general increase in average depth to water and average pumping depth (Table 17). If competition for water between urban communities and agriculture increases as has been noted in other southern states, especially during periods of drought, average pumping depth will be an important parameter to track.

Soils

Within Mississippi, 186 soil series are recognized. In 1997, 121 soil series had at least part of their acreage cultivated, down seven in 1992. Smithdale (fine-loamy, siliceous, subactive, thermic Typic Hapludults) had the most acres — more than 3.714 million. Pikeville (fine-loamy, siliceous, subactive, thermic Typic Paleudults), rock outcrop, and Frost (fine-silty, mixed, active, hyperthermic Typic Glossaqualfs) had the fewest with 1,300 acres each. Sharkey (very-fine, smectitic, thermic, Chromic Epiaquerts) had the most cultivated and total cropland acres, while Talla (fine-loamy, siliceous, active, thermic Glossaquic Natrudalfs) had the fewest cropland acres. Providence (fine-silty, mixed, active, thermic Typic Fragiudalfs) had more acres enrolled in CRP with an estimated average annual soil erosion of 0.5 ton per acre in 1997. Smithdale also had the most acres in forestland (both types).

Until verified by field visits to all NRI points, it is important to note that soils data in the NRI are a best estimate for each point.

Hydric Soils

Mississippi has more than 6.2 million acres classified as having hydric soils (USDA-SCS, 1994). A query of the State Soil Geographic Database (STATSGO) showed that most hydric soils are found in the Delta and near the Pascagoula-Black-Chickasawhay Rivers.

Best managed for wetlands, hydric soils are highly productive for agricultural use. Also, hydric soils may sequester C and enhance soil quality with less crop residue management. Approximately 34% of cotton, 62% of soybean, and 90% of rice acres in 1997 were grown on hydric soils (Tables 6 and 18). Crops grown on hydric soils tended to have less soil erosion when compared with all acres (Tables 6 and 18). Sharkey is the predominant hydric soil in the state with 1,284,300 acres. Of this, 910,900 acres were in cropland during 1997. Approximately 17.8% of nut crops, 25% of soybean, and 45.7% of rice acres were planted on a Sharkey soil in 1997 (data not shown). The NRI does not include hydric inclusions.

Highly Erodible Land

Highly erodible land can serve as an environmental indicator. As more HEL is used for agricultural production, soil erosion can increase, thus decreasing soil quality.

Since 1982, the number of acres of HEL has decreased by 655,300 acres (Table 18). Decrease in soybean acres of HEL was a leading reason with more than 1 million acres in 1982 and 167,000 in 1997. Generally, soil erosion decreased with each land use from 1982 to 1997 for HEL (Table 18).

Loring (fine-silty, mixed, active, thermic Oxyaquic Fraqiudalfs), found mainly in the Brown Loam, had 222,800 acres of HEL in 1997 (data not shown). Of this, 157,500 acres were in cropland. During 1997, Loring had the most acres of hay land (all types), other cropland not planted, soybean, and sorghum, and it ranked second for CRP and wheat acres.

Prime Farmland

Prime farmland is defined as land with the best combination of physical and chemical characteristics for food, feed, forage, fiber, and oilseed crop production and is also available for these uses (USDA-NRCS, 1999). According to STATSGO, Mississippi had 6.2 million acres that could be classified as prime farmland (Code 1). Soils in the Delta and the Brown Loam are classified as prime farmland only when protected from flooding or not frequently flooded during the growing season (Code 3).

Delta soils Sharkey, Alligator (very-fine, smectitic, thermic Chromic Dystraquerts), Dundee (fine-silty, mixed, active, thermic Typic Endoaqualfs), and Forestdale (fine, smectitic, thermic Typic Endoaqualfs) are the top four soils with the most acres of potential prime farmland and cropland on prime farmland (data not shown). These soils also had the highest acreage of soybean and rice in 1997. Of the prime farmland soils with 2,000 or more acres, Memphis (fine-silty, mixed, active, thermic Typic Hapludalfs) and Loring had the

highest soil erosion rates — 14.5 and 10.5 tons per acre per year, respectively.

In 1997, more than 5.75 million acres of crops were grown on prime farmland (Table 19). Approximately 80%, 77%, and 85% of the total acreage of cotton, soybean, and rice were planted on prime farmland, respectively (Tables 6 and 19). Soil erosion associated with these crops tended to be less on prime farmland than on all acres (Table 6 and 20).

Acres of irrigated prime farmland almost doubled during the 1982-1997 period (Table 19). This change was mainly due to the increases in irrigated soybean and cotton.

Mississippi ranked third nationally behind Delaware and Ohio in number of prime farmland acres developed from 1992 to 1997. Although more than 80,000 acres of prime farmland were developed since 1992, this was less than the amount developed from 1982 to 1987 or from 1987 to 1992 (Table 19).

Land Capability Class

As Mississippi strives to meet the needs for food and fiber of the nation and the world, it is important to track the trends of land use by land capability classification. As land is taken out of production and converted to nonagriculture or forestry uses, it is essential that the land be utilized according to its capability. Then, economic and environmental risks are reduced.

Acres by broadland use (Table 20) and land use (Table 21) are shown for 1982-1997. Classification (USDA-SCS, 1961) is coded in the NRI only for agricultural land. For broadland use, acres in Classes I to VII tended to decrease for cultivated cropland and increase for noncultivated cropland. The greatest percent increase for noncultivated cropland from 1982 to 1997 was in Class VII. Acres of forestland in Class VIII increased from 1982 to 1997. Due to the difficulty in operating heavy equipment on this type of terrain, logging operators may not pay landowners top prices for timber. Class VI and VII soils have severe limitations, such as steep slopes, severe erosion hazards, shallow soils, and low moisture capacity. Highly erosive crops such as soybean, cotton, and other vegetables tended to have large decreases in acres during 1982-1997. Acreages of hay land and ungrazed forestland — more appropriate uses for Class VI and VII soils — increased.

Table 18. Acres and estimated soil erosion for crops grown on hydric soils and highly erodible land in Mississippi, 1982-1997.[1]

Cropland use	Year	Hydric		Highly erodible	
		Acres	Erosion	Acres	Erosion
		x1,000	*tons/A/yr*	*x1,000*	*tons/A/yr*
Nut	1982	3.2	0.5	9.5	0.2
	1987	6.2	0.2	10.2	0.2
	1992	6.7	0.2	10.2	0.2
	1997	14.5	1.3	10.1	0.2
Vineyard	1982	—	—	5.1	0.9
	1987	—	—	—	—
	1992	—	—	5.1	0.9
	1997	—	—	5.1	0.9
Corn	1982	22.4	5.1	127.1	16.3
	1987	14.5	4.4	89.5	19.4
	1992	41.5	3.7	96.7	16.9
	1997	78.6	4.5	69.2	14.4
Cotton	1982	485.3	5.9	167.4	19.5
	1987	432.0	6.1	213.1	19.2
	1992	545.1	5.9	206.8	21.2
	1997	436.0	6.1	157.9	18.3
Hay - all types	1982	20.4	0.3	124.4	5.0
	1987	14.8	0.7	110.4	5.1
	1992	20.8	2.2	130.1	3.0
	1997	35.5	1.0	213.9	2.1
Pasture - all types	1982	289.6	0.2	45.0	2.1
	1987	302.0	0.3	166.8	2.3
	1992	310.0	0.3	33.2	2.8
	1997	277.3	0.3	8.0	1.4
Rice	1982	286.1	1.9	—	—
	1987	203.3	2.7	1.2	12.7
	1992	314.6	2.3	—	—
	1997	215.4	2.2	—	—
Sorghum	1982	6.3	3.3	32.2	22.3
	1987	44.8	4.6	45.2	16.0
	1992	45.8	3.3	13.2	22.6
	1997	14.8	3.5	6.4	12.6
Soybean	1982	1,633.6	3.8	1,024.6	20.5
	1987	1,317.5	4.2	461.9	20.5
	1992	1,163.6	3.4	202.6	15.9
	1997	1,430.5	3.4	167.6	13.2
Peanut	1982	—	—	1.4	26.3
	1987	1.3	4.1	—	—
	1992	1.3	6.6	1.7	17.5
	1997	1.3	6.5	1.7	17.5
Summer fallow	1982	2.4	4.4	3.0	13.0
	1987	—	—	4.2	5.5
	1992	3.9	5.3	—	—
	1997	4.2	4.4	1.5	2.6
Other close grown[2]	1982	—	—	12.3	23.3
	1987	—	—	10.6	15.5
	1992	1.2	5.8	26.2	11.2
	1997	2.5	4.2	28.8	10.8
Other - not planted[2]	1982	60.3	2.4	174.6	11.2
	1987	470.4	3.4	246.0	10.2
	1992	268.9	1.6	163.4	8.5
	1997	123.0	2.3	113.9	8.2
Other vegetables[2]	1982	—	—	34.4	28.8
	1987	1.0	4.3	19.7	25.7
	1992	1.0	4.5	26.8	15.9
	1997	2.9	6.9	15.6	17.4
Wheat	1982	108.9	4.2	80.9	12.6
	1987	97.7	3.1	39.8	14.4
	1992	83.3	3.8	17.0	11.2
	1997	48.1	3.6	15.9	8.5
Forestland - grazed	1982	192.3	—	—	—
	1987	152.8	—	—	—
	1992	128.4	—	—	—
	1997	87.9	—	—	—
Forestland - ungrazed	1982	2,652.8	—	—	—
	1987	2,682.0	—	—	—
	1992	2,714.0	—	—	—
	1997	2,777.1	—	—	—
CRP	1982	—	—	—	—
	1987	5.6	2.0	199.7	5.5
	1992	61.0	0.8	440.6	4.0
	1997	71.4	0.7	427.2	1.7
Totals	**1982**	**5,763.6**		**1,679.6**	
	1987	**5,745.9**		**1,348.5**	
	1992	**5,711.1**		**1,216.1**	
	1997	**5,621.0**		**1,024.3**	

[1]Source: 1997 NRI.
[2]Other close grown – seed crops such as alfalfa, ryegrass, millet, etc.; other not planted – may include set aside or similar programs; other vegetables – melons, carrots, celery, etc.

Table 19. Acres and annual soil erosion, irrigated acres, and acres developed by 1997 of prime farmland in Mississippi, 1982-1997.

Land use	Year	Acres	Erosion	Acres irrigated	Acres developed
		x1,000	*tons/A/yr*	*x1,000*	*x1,000*
Nut	1982	26.0	0.4	—	0.6
	1987	33.7	0.4	—	0.6
	1992	31.8	0.5	—	0.4
	1997	35.2	0.7	—	—
Other horticultural crops	1982	10.0	7.1	—	—
	1987	4.5	0.1	—	—
	1992	4.5	2.3	—	—
	1997	4.3	0.1	—	—
Corn	1982	176.9	6.9	—	4.6
	1987	159.3	7.7	—	3.1
	1992	245.4	6.3	7.4	2.2
	1997	351.7	5.0	52.6	—
Sorghum	1982	47.0	6.8	—	0.8
	1987	118.3	6.0	9.0	1.1
	1992	60.1	6.1	6.0	0.2
	1997	23.2	5.5	2.7	—
Soybean	1982	3,098.4	5.4	204.5	26.8
	1987	2,127.4	5.1	338.7	14.5
	1992	1,586.9	3.9	367.7	8.4
	1997	1,769.2	3.9	526.3	—
Cotton	1982	1,123.4	6.9	50.7	10.3
	1987	1,123.5	7.2	127.8	8.1
	1992	1,303.1	7.4	234.0	8.1
	1997	1,027.6	7.4	185.1	—
Peanut	1982	—	—	—	—
	1987	5.6	4.2	—	—
	1992	4.4	10.1	—	—
	1997	4.7	9.0	—	—
Potato	1982	4.3	4.2	—	—
	1987	—	—	—	—
	1992	—	—	—	—
	1997	13.6	8.2	—	—
Other vegetables	1982	24.8	6.3	—	0.7
	1987	13.3	6.4	1.3	0.5
	1992	24.2	8.7	2.4	0.4
	1997	14.8	8.9	2.6	—
Wheat	1982	204.3	5.9	30.5	2.0
	1987	169.8	4.5	29.0	3.2
	1992	110.5	4.6	17.1	0.7
	1997	88.4	4.5	24.1	—
Rice	1982	262.7	2.0	262.7	0.9
	1987	201.3	3.0	201.3	0.4
	1992	280.9	2.4	280.9	0.4
	1997	203.2	2.4	203.2	—
Other close grown	1982	9.6	4.7	—	1.3
	1987	2.6	3.2	—	—
	1992	20.2	6.2	—	0.4
	1997	12.1	3.1	—	—
Hay land - grass	1982	89.3	1.8	1.3	1.6
	1987	103.5	2.2	1.4	1.9
	1992	129.8	0.9	—	0.6
	1997	241.7	0.7	2.5	—
Hay land - legume	1982	3.1	—	—	—
	1987	5.6	0.5	—	—
	1992	6.5	1.4	—	—
	1997	1.8	3.7	—	—
Hay land - grass & legume	1982	12.9	0.5	—	—
	1987	4.6	1.3	—	—
	1992	7.1	0.6	—	0.1
	1997	6.5	1.5	—	—
Summer fallow	1982	20.9	6.3	—	—
	1987	10.6	2.3	—	—
	1992	1.3	4.4	1.3	—
	1997	13.3	3.6	5.1	—
Other - not planted	1982	159.9	2.7	—	6.7
	1987	670.3	3.7	129.6	7.4
	1992	431.0	2.3	45.6	4.7
	1997	235.1	2.2	19.7	—
Pasture - grass	1982	1,570.4	0.6	—	33.1
	1987	1,680.4	0.5	—	27.5
	1992	1,668.9	0.5	—	19.6
	1997	1,566.4	0.5	—	—
Pasture - grass, forbs, & legume	1982	265.5	0.4	—	5.2
	1987	227.9	0.5	—	3.4
	1992	227.2	0.5	—	2.4
	1997	172.9	0.4	—	—
Forestland - grazed	1982	449.1	—	—	8.5
	1987	369.5	—	—	7.3
	1992	330.3	—	—	3.4
	1997	283.1	—	—	—
Forestland - ungrazed	1982	2,891.9	—	—	53.3
	1987	3,154.1	—	—	42.0
	1992	3,308.8	—	—	31.1
	1997	3,566.0	—	—	—
CRP land	1987	151.8	2.5	—	0.3
	1992	440.5	1.2	—	0.3
	1997	455.1	0.4	—	—
Totals	**1982**	**10,466.8**		**549.7**	**156.4**
	1987	**10,349.6**		**839.3**	**121.4**
	1992	**10,234.7**		**963.6**	**83.5**
	1997	**10,089.9**		**1,023.9**	

[1]Source: 1997 NRI

Table 20. Acres of broadland use in Mississippi, by land classification, 1982-1997 (thousands of acres).[1]

Broadland use	Year	Land Capability Class									
		I	II	III	IV	V	VI	VII	VIII	None	Total
Cultivated cropland	1982	302.4	2,975.9	2,669.1	686.4	294.0	136.2	132.0	—	—	7,196.0
	1987	287.9	2,592.4	2,499.0	606.0	290.7	118.2	114.4	—	—	6,508.6
	1992	256.4	2,186.5	2,219.2	456.6	261.3	53.9	47.8	—	—	5,481.7
	1997	238.9	1,891.3	2,086.2	410.0	226.6	45.3	33.2	—	—	4,931.5
Noncult. cropland	1982	7.0	99.6	70.2	14.6	2.8	18.5	7.3	—	—	220.0
	1987	9.9	86.2	28.9	15.4	2.6	8.9	4.5	—	—	156.4
	1992	9.6	126.3	47.3	36.4	3.9	12.4	8.6	—	—	244.5
	1997	15.0	224.0	88.7	42.3	6.4	20.9	23.6	—	—	420.9
Pastureland	1982	81.7	1,450.1	1,021.9	491.7	68.8	344.0	527.8	3.3	—	3,989.3
	1987	78.9	1,495.1	994.6	474.6	73.8	304.3	464.1	5.3	—	3,890.7
	1992	84.3	1,487.1	1,017.4	486.5	70.1	312.3	470.8	3.6	—	3,932.1
	1997	82.5	1,390.1	962.2	454.2	65.7	275.2	446.9	2.5	—	3,679.3
Forestland	1982	147.7	2,846.3	2,340.9	1,981.1	1,321.8	1,594.6	5,075.7	10.9	—	15,319.0
	1987	158.8	3,022.2	2,408.8	2,027.3	1,316.0	1,627.7	5,117.1	16.4	—	15,694.3
	1992	169.0	3,114.2	2,463.1	2,058.0	1,322.2	1,650.4	5,121.1	17.8	—	15,915.8
	1997	173.5	3,290.2	2,535.3	2,089.2	1,333.7	1,659.4	5,106.7	20.8	—	16,208.8
Minor land	1982	9.1	81.6	66.6	24.9	11.3	16.7	28.2	89.3	—	327.7
	1987	9.5	82.8	67.8	25.3	10.4	18.9	27.5	85.2	—	327.4
	1992	9.1	81.1	67.5	26.2	10.4	19.3	27.0	85.2	—	325.8
	1997	9.1	97.7	100.6	36.0	10.8	27.3	24.6	83.2	—	389.3
Urban / built-up	1982	—	—	—	—	—	—	—	—	657.4	657.4
	1987	—	—	—	—	—	—	—	—	724.0	724.0
	1992	—	—	—	—	—	—	—	—	794.8	794.8
	1997	—	—	—	—	—	—	—	—	991.7	991.7
Rural transportation	1982	—	—	—	—	—	—	—	—	462.8	462.8
	1987	—	—	—	—	—	—	—	—	469.1	469.1
	1992	—	—	—	—	—	—	—	—	472.8	472.8
	1997	—	—	—	—	—	—	—	—	482.3	482.3
Small water body	1982	—	—	—	—	—	—	—	—	379.9	379.9
	1987	—	—	—	—	—	—	—	—	435.9	435.9
	1992	—	—	—	—	—	—	—	—	473.0	473.0
	1997	—	—	—	—	—	—	—	—	498.2	498.2
Census water	1982	—	—	—	—	—	—	—	—	340.6	340.6
	1987	—	—	—	—	—	—	—	—	355.5	355.5
	1992	—	—	—	—	—	—	—	—	356.8	356.8
	1997	—	—	—	—	—	—	—	—	356.8	356.8
Federal land	1982	—	—	—	—	—	—	—	—	1,634.6	1,634.6
	1987	—	—	—	—	—	—	—	—	1,673.5	1,673.5
	1992	—	—	—	—	—	—	—	—	1,751.9	1,751.9
	1997	—	—	—	—	—	—	—	—	1,769.7	1,769.7
CRP land	1982	—	—	—	—	—	—	—	—	—	—
	1987	—	122.3	103.6	26.8	—	24.4	14.8	—	—	291.9
	1992	8.3	342.1	242.1	84.7	10.4	46.1	44.4	—	—	778.1
	1997	10.9	365.1	229.6	85.9	16.1	44.2	47.0	—	—	798.8
Totals	**1982**	**547.9**	**7,453.5**	**6,168.7**	**3,198.7**	**1,698.7**	**2,110.0**	**5,771.0**	**103.5**	**3,475.3**	**30,527.3**
	1987	**545.0**	**7,401.0**	**6,102.7**	**3,175.4**	**1,693.5**	**2,102.4**	**5,742.4**	**106.9**	**3,658.0**	**30,527.3**
	1992	**536.7**	**7,337.3**	**6,056.6**	**3,148.4**	**1,678.3**	**2,094.4**	**5,719.7**	**106.6**	**3,849.3**	**30,527.3**
	1997	**529.9**	**7,258.4**	**6,002.6**	**3,117.6**	**1,659.3**	**2,072.3**	**5,682.0**	**106.5**	**4,098.7**	**30,527.3**

[1]Source: 1997 NRI.

Table 21. Land Capability Class acreage by land use in Mississippi, 1982-1997 (thousands of acres).[1]

Land use	Year	Land Capability Class								
		I	II	III	IV	V	VI	VII	VIII	Total
Nut	1982	4.0	22.0	—	5.7	0.6	—	—	—	32.3
	1987	4.0	26.3	1.2	8.0	1.3	—	—	—	40.8
	1992	4.0	23.7	2.8	7.1	1.3	—	—	—	38.9
	1997	5.2	23.1	5.6	7.0	5.1	—	—	—	46.0
Corn	1982	5.5	154.2	43.2	23.5	14.3	2.2	8.6	—	251.5
	1987	8.9	133.3	36.2	13.4	3.9	3.1	6.5	—	205.3
	1992	13.8	193.9	62.5	19.4	5.7	1.3	5.3	—	301.9
	1997	21.3	253.8	100.1	33.5	2.0	5.2	3.4	—	419.3
Sorghum	1982	—	42.8	12.1	11.4	2.8	5.2	3.2	—	77.5
	1987	0.5	77.5	56.8	11.9	3.4	—	7.0	—	157.1
	1992	3.1	29.7	32.4	11.2	5.1	—	—	—	81.5
	1997	2.6	14.3	9.6	—	7.1	—	—	—	33.6
Soybean	1982	104.2	1,757.4	1,687.7	413.7	192.1	80.2	85.1	—	4,320.4
	1987	74.7	1,064.0	1,227.4	247.2	188.5	44.8	34.2	—	2,880.8
	1992	35.3	708.8	1,007.9	184.1	150.9	22.3	20.5	—	2,129.8
	1997	52.5	657.2	1,196.2	212.9	151.4	17.6	8.1	—	2,295.9
Cotton	1982	169.3	650.0	423.2	99.2	19.0	5.0	2.5	—	1,368.2
	1987	168.6	738.5	365.0	102.3	18.7	6.7	5.1	—	1,404.9
	1992	165.7	809.5	475.0	97.4	26.2	4.1	3.8	—	1,581.7
	1997	142.1	667.5	358.3	83.1	24.3	3.6	1.5	—	1,280.4
Peanut	1982	—	—	1.4	—	—	—	—	—	1.4
	1987	2.7	1.6	1.3	—	—	—	—	—	5.6
	1992	2.7	5.9	1.7	—	—	—	—	—	10.3
	1997	—	3.0	1.7	—	1.3	—	—	—	6.0
Potato	1982	—	4.3	2.7	—	—	—	—	—	7.0
	1987	—	—	1.4	—	—	—	—	—	1.4
	1992	—	—	—	—	—	—	—	—	—
	1997	—	8.9	13.0	—	—	—	—	—	21.9
Other vegetable crops	1982	—	24.3	14.6	5.8	—	6.8	1.3	—	52.8
	1987	1.3	12.1	9.8	5.2	—	3.2	1.3	—	32.9
	1992	1.3	24.2	7.0	2.8	—	3.2	1.3	—	39.8
	1997	1.0	16.0	4.0	2.8	1.9	1.8	1.3	—	28.8
Other row crops	1982	—	9.7	1.3	3.0	—	—	—	—	14.0
	1987	—	—	1.3	—	—	—	1.0	—	2.3
	1992	—	—	1.3	—	—	—	—	—	1.3
	1997	—	—	0.8	—	2.5	—	—	—	3.3
Wheat	1982	15.1	108.0	117.1	34.4	20.6	2.7	2.8	—	300.7
	1987	13.3	81.7	88.5	21.6	7.0	—	—	—	212.1
	1992	4.0	50.0	67.3	17.9	10.4	—	—	—	149.6
	1997	—	37.9	57.9	1.5	5.2	1.0	3.1	—	106.6
Rice	1982	3.0	10.8	251.6	19.0	31.0	—	—	—	315.4
	1987	3.0	15.9	184.9	13.5	13.2	—	3.4	—	233.9
	1992	2.2	21.3	255.0	29.4	37.9	—	—	—	345.8
	1997	—	21.1	180.3	22.3	15.4	—	—	—	239.1
Other close grown	1982	—	9.3	3.7	3.0	—	3.8	—	—	19.8
	1987	—	3.7	1.5	3.0	—	3.1	1.9	—	13.2
	1992	—	14.7	11.5	2.9	—	1.3	1.7	—	32.1
	1997	—	10.9	7.4	4.2	1.3	6.9	4.1	—	34.8

[1]Source: 1997 NRI.

Table 21 (continued). Land Capability Class acreage by land use in Mississippi, 1982-1997 (thousands of acres).[1]

Land use	Year	Land Capability Class								
		I	II	III	IV	V	VI	VII	VIII	Total
Hay land - grass	1982	3.0	72.6	64.9	7.6	2.2	17.1	5.9	—	173.3
	1987	4.7	91.1	44.5	27.6	2.6	11.1	6.2	—	187.8
	1992	13.1	109.6	52.1	28.9	3.8	12.9	8.2	—	228.6
	1997	9.8	217.8	84.8	34.6	1.3	19.2	22.3	—	389.8
Hay land - legume	1982	—	3.1	2.2	—	—	1.7	1.4	—	8.4
	1987	—	5.6	—	—	—	1.7	—	—	7.3
	1992	1.1	5.4	1.4	—	—	1.7	1.4	—	11.0
	1997	—	1.8	—	—	—	—	1.3	—	3.1
Hay land - grass & legume	1982	—	12.9	8.1	—	—	7.4	—	—	28.4
	1987	—	3.6	3.5	0.8	—	—	—	—	7.9
	1992	—	4.2	5.2	0.8	—	—	—	—	10.2
	1997	—	2.8	3.7	—	—	1.7	—	—	8.2
Summer fallow	1982	1.4	17.1	2.0	1.5	—	0.8	—	—	22.8
	1987	—	8.4	3.0	0.8	—	0.8	—	—	13.0
	1992	—	—	1.3	2.6	—	—	—	—	3.9
	1997	2.6	6.5	5.7	—	—	—	—	—	14.8
Other cropland not planted	1982	2.4	125.1	81.4	57.5	12.5	18.8	25.3	—	323.0
	1987	12.1	319.5	448.2	131.6	54.7	28.1	35.0	—	1,029.2
	1992	14.0	257.3	257.9	74.5	20.9	16.9	14.2	—	655.7
	1997	16.8	146.7	136.9	40.2	14.2	9.2	10.3	—	374.3
Pasture - grass	1982	71.3	1,272.6	913.5	429.6	57.7	271.2	474.8	3.3	3,494.0
	1987	72.8	1,379.0	925.6	453.6	56.1	254.5	428.1	5.3	3,575.0
	1992	84.1	1,349.9	918.9	439.8	54.4	243.9	414.9	3.6	3,509.5
	1997	78.9	1,273.4	874.0	428.5	51.7	228.8	409.9	2.5	3,347.7
Pasture - grass, forbs, & legume	1982	11.9	213.8	126.4	68.3	12.8	75.8	56.2	—	565.2
	1987	7.6	200.6	119.7	54.1	17.7	74.3	53.3	—	527.3
	1992	4.7	184.2	117.0	54.2	18.7	71.0	55.9	—	505.7
	1997	3.6	137.1	93.5	29.4	14.0	46.4	38.4	—	362.4
Forest - grazed	1982	11.5	400.4	298.3	202.2	79.0	217.9	668.8	1.2	1,879.3
	1987	5.7	327.0	256.1	153.9	57.1	209.1	554.5	1.2	1,564.6
	1992	6.1	279.3	238.3	148.4	53.7	199.0	505.7	2.9	1,433.4
	1997	5.8	237.0	183.8	121.4	45.8	167.5	385.2	2.9	1,149.4
Forest - ungrazed	1982	136.2	2,445.9	2,042.6	1,778.9	1,242.8	1,376.7	4,406.9	9.7	13,439.7
	1987	153.1	2,695.2	2,152.7	1,873.4	1,258.9	1,418.6	4,562.6	15.2	14,129.7
	1992	162.9	2,834.9	2,224.8	1,909.6	1,268.5	1,451.4	4,615.4	14.9	14,482.4
	1997	167.7	3,053.2	2,351.5	1,967.8	1,287.9	1,491.9	4,721.5	17.9	15,059.4
CRP land	1987	—	122.3	103.6	26.8	—	24.4	14.8	—	291.9
	1992	8.3	342.1	242.1	84.7	10.4	46.1	44.4	—	778.1
	1997	10.9	365.1	229.6	85.9	16.1	44.2	47.0	—	798.8
Totals	**1982**	**538.8**	**7,371.9**	**6,102.1**	**3,173.8**	**1,687.4**	**2,093.3**	**5,742.8**	**14.2**	**26,724.3**
	1987	**535.5**	**7,318.2**	**6,034.9**	**3,150.1**	**1,683.1**	**2,083.5**	**5,714.9**	**21.7**	**26,541.9**
	1992	**527.6**	**7,256.2**	**5,989.1**	**3,122.2**	**1,667.9**	**2,075.1**	**5,692.7**	**21.4**	**26,352.2**
	1997	**520.8**	**7,160.7**	**5,902.0**	**3,081.6**	**1,648.5**	**2,045.0**	**5,657.4**	**23.3**	**26,039.3**

[1]Source: 1997 NRI.

CONCLUSIONS

Demand for a readily available and safe supply of food and water is projected to increase. Therefore, Mississippi must continue to conserve its natural resources. Most of the 2 million acres taken out of cropland production was entered into the CRP, thus reducing sediment in lakes and rivers. Implementing various conservation practices and management options such as buffer strips and precision farming should help decrease nutrient and pesticide runoff. Land operators of irrigated cropland should increase water use efficiency, especially during dry years and in areas adjoining urban development. Research by the Mississippi Agricultural and Forestry Experiment Station, USDA-ARS Soil Sedimentation Laboratory, and USDA-NRCS Plant Material Center, as well as advances in equipment, technology, and herbicides, have proven CT is a viable alternative for reducing costs while at least maintaining crop yields. However, use of CT seems to have leveled off in the state. If a market develops for carbon credits, increases in SOC from CT crops and biofuel production could provide an additional source of income. Cropland development has been on a downward trend since 1987, but efforts should be made to conserve irrigated cropland and prime farmland. Mississippi is a leader in funds spent for agricultural and forestry research developing conservation practices. Programs and demonstration projects from agencies such as the MSU Extension Service and NRCS should be funded accordingly to disseminate research results.

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DEFINITIONS

Berries: Category for crops such as cranberries and strawberries.

Broad cover/use: Classification used to describe the general use of land and water surfaces.

Census water: Includes water bodies at least 40 acres in size and perennial streams at least 1/8 mile wide.

Conservation practice: A specific treatment, such as a structural or vegetative measure or management technique, commonly used to meet specific needs in planning and conservation, for which standards and specifications have been developed.

Conservation Reserve Program (CRP): Federal program in which highly erodible land is taken out of production in return for annual cash payments.

Conservation tillage: Tillage system that leaves 30% or more residue on the surface after planting. Includes no-till, strip-till, ridge-till, and mulch-till.

Conventional tillage: Tillage system that leaves less than 15% residue after planting or less than 500 pounds per acre of small grain residue equivalent throughout the critical erosion period.

Cultivated cropland: Land used for the production of row crops, small grains, orchard crops, and nursery and other specialty crops.

Erodibility Index: Used to determine Highly Erodible Land. Calculated as RKLS/C where R=R is a rainfall factor, K is a soil erodibility factor, L is a slope length factor, S is a slope-steepness factor, and C is a cover management factor.

Fruit: Category for orchard crops such as apples, figs, orange, peach, pear, and plums.

Highly Erodible Land (HEL): Land with an Erodibility Index greater than eight.

Hydric soil: A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.

Land capability classification: System of grouping soils on the basis of their capability to produce common cultivated crops and pasture plants without deteriorating over a long period of time. Classification is subdivided into capability class and capability subclass (USDA-SCS, 1961):

Capability class — Broadest category with codes I to VIII indicating progressively greater limitations and fewer choices for agriculture.

Capability subclass — Secondary classification with codes e (erosion), w (wetness), s (root zone), and c (climatic) limitations.

Land cover/use: Vegetation or other kind of material that covers the land surface. Land use is the purpose of human activity on the land.

Minor land: Includes farmsteads and other farm structures, field windbreaks, barren land, and marshland.

Nuts: Category for crops such as almonds, pecans, and walnuts.

Other close grown crops: Crops that are generally drill seeded or broadcast such as alfalfa (seed), grasses (seed), and canola, but excluding wheat, oat, rice, and barley.

Other cropland not planted: Land in programs such as set-aside.

Other farmland/other land: Land used for field windbreaks, commercial feedlots, greenhouses, nurseries, poultry facilities, and airplane landing strips not associated with farmsteads.

Other horticultural crops: Operations for flower, bulb, or seed production and sales.

Other vegetable: Truck or vegetable crops such as melons, beans, peas, pumpkins, sweetpotatoes, and okra.

Other row crops: Crops other than corn, sorghum, soybean, cotton, peanut, tobacco, sugar beet, potato, or sunflower usually grown in rows.

Prime farmland: Land with the best combination of physical and chemical characteristics for food, feed, forage, fiber, and oilseed crop production. Also available for these uses.

Codes and descriptions:

1. Not prime farmland.
2. All areas are prime farmland.
3. Only drained areas are prime farmland.
4. Only areas protected from flooding or not frequently flooded during the growing season are prime farmland.
5. Only irrigated areas are prime farmland.
6. Only drained areas that are either protected from flooding or not frequently flooded during the growing season are prime farmland.
7. Only irrigated areas that have been drained are prime farmland.
8. Only irrigated areas that are either protected from flooding or not frequently flooded during the growing season are prime farmland.

Reduced-till: Tillage system that leaves 15-30% residue on the soil surface after planting or 500-1,000 pounds per acre of small grain residue equivalent throughout the critical erosion period.

Rural transportation: Highways, roads, railroads, and associated rights-of-way outside urban and built-up areas. Private and logging roads are included.

Small water areas: Area less than 40 acres.

State Soil Geographic (STATSGO): Database made by generalizing detailed soil survey data. Mapping scale is 1:250,000 (1:1,000,000 for Alaska). Level of mapping is designed to be used for broad planning and management uses covering state, regional, and multistate areas. STATSGO map units average from 7,000 to 60,000 acres in size and have a minimum size of 1,544 acres.

Summer fallow: Tillage (usually at least twice) of unseeded cropland during the summer to control weeds and retain moisture in the soil for the growth of a later crop.

Universal Soil Loss Equation (USLE): Equation to estimate average annual soil loss from sheet and rill erosion. Location-specific data for the field in which the NRI point falls or that portion of the field surrounding the point that would be considered in conservation planning are used in the NRI calculations. The equation is $A = RKLSCP$, where A is the computed soil loss per unit area, R is a rainfall factor, K is a soil erodibility factor, L is a slope length factor, S is a slope-steepness factor, C is a cover management factor, and P is a conservation practice factor.

Urban and built-up land: Land with such uses as airports, cemeteries, commercial sites, railroad yards, residences, industrial sites, or parking lots.

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