

Note: This is a reference cited in AP 42, *Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources*. AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

AP42 Section:	9.2.1
Reference:	1
Title:	H. L. Hargett, et al., Fertilizer Use By Class, National Fertilizer Development Center, Muscle Shoals, AL, 1989.

2

FERTILIZER USE BY CLASS

BAG, BULK, FLUID

U.S. FERTILIZER CONSUMPTION BY CLASS

U.S. fertilizer consumption (excluding natural organic, secondary, and micronutrient materials) increased slightly from 42.7 million tons in 1987-88 to 42.8 million tons in 1988-89—a gain of less than one percent. In 1988-89, dry bulk materials represented 52.1 percent of total consumption, fluid fertilizers accounted for 38.9 percent, and bagged materials the remaining 9.0 percent. Both dry and fluid fertilizers increased in tonnage over last year but market shares of each remained essentially the same. Bagged fertilizer continued to drop in tonnage as well as in market share.

Fluid fertilizer use (including anhydrous ammonia) exceeded 16.6 million tons. Solid materials accounted for 26.2 million tons. TVA estimates that total dry bulk fertilizer distribution was 22.3 million tons, representing 85 percent of all solid materials. Estimated fertilizer sales of bagged products was 3.9 million tons compared to 4.1 million tons in 1987-88.

Multiple-nutrient fertilizer consumption was 17.5 million tons in 1988-89. Class distribution of these materials was 60.1 percent dry bulk form, 22.4 percent fluid, and 17.5 percent bagged. Fluid multiple-nutrient materials consumption remained about the same as for 1987-88 but increased in total market share from 9.1 percent to 9.2 percent.

This report is compiled annually from individual State fertilizer tonnage reports. Forty States provided complete breakdown by class in 1988-89.

Complete U.S. fertilizer consumption by State and product is published annually by the National Fertilizer Development Center. The latest edition, **Commercial Fertilizers—1989**, TVA Bulletin Y-211, can be obtained from the TVA Technical Library, NFD 1A 107E, Muscle Shoals, Alabama 35660-1010 at \$6.00 per copy.

6. Tennessee Valley Authority

NFDC

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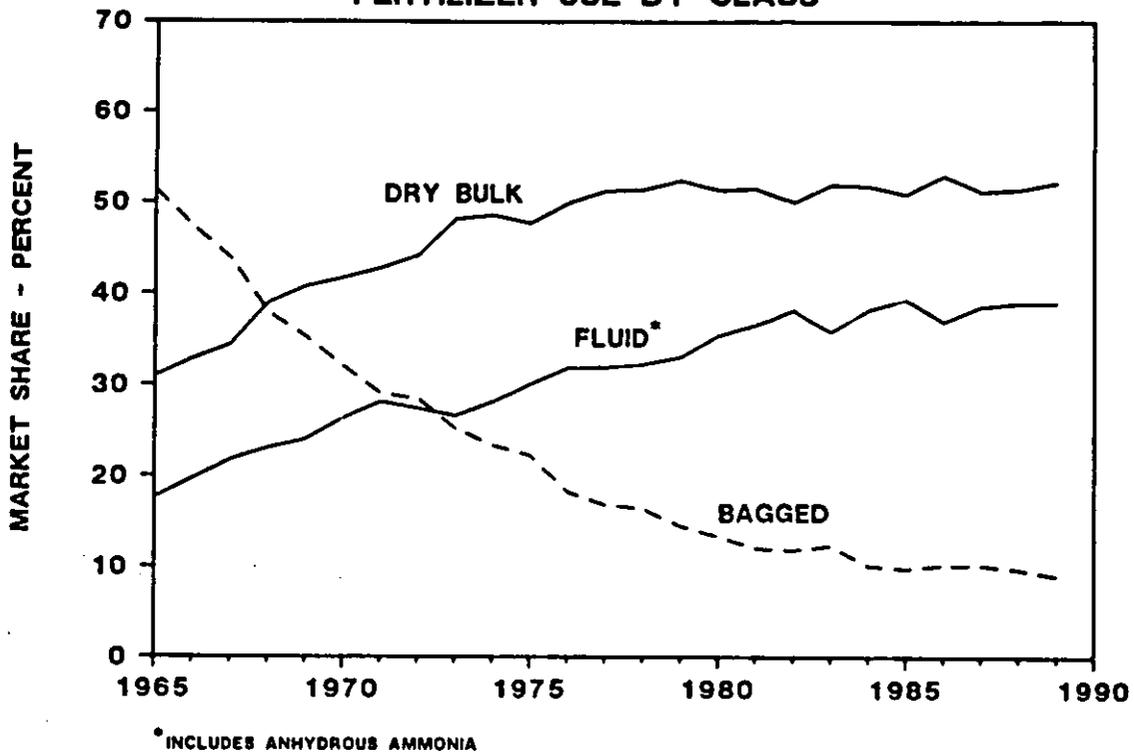
ECONOMICS AND MARKETING
NATIONAL FERTILIZER DEVELOPMENT CENTER
TENNESSEE VALLEY AUTHORITY
MUSCLE SHOALS, ALABAMA 35660
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FERTILIZER USE BY CLASS



MULTIPLE-NUTRIENT FERTILIZER USE BY CLASS

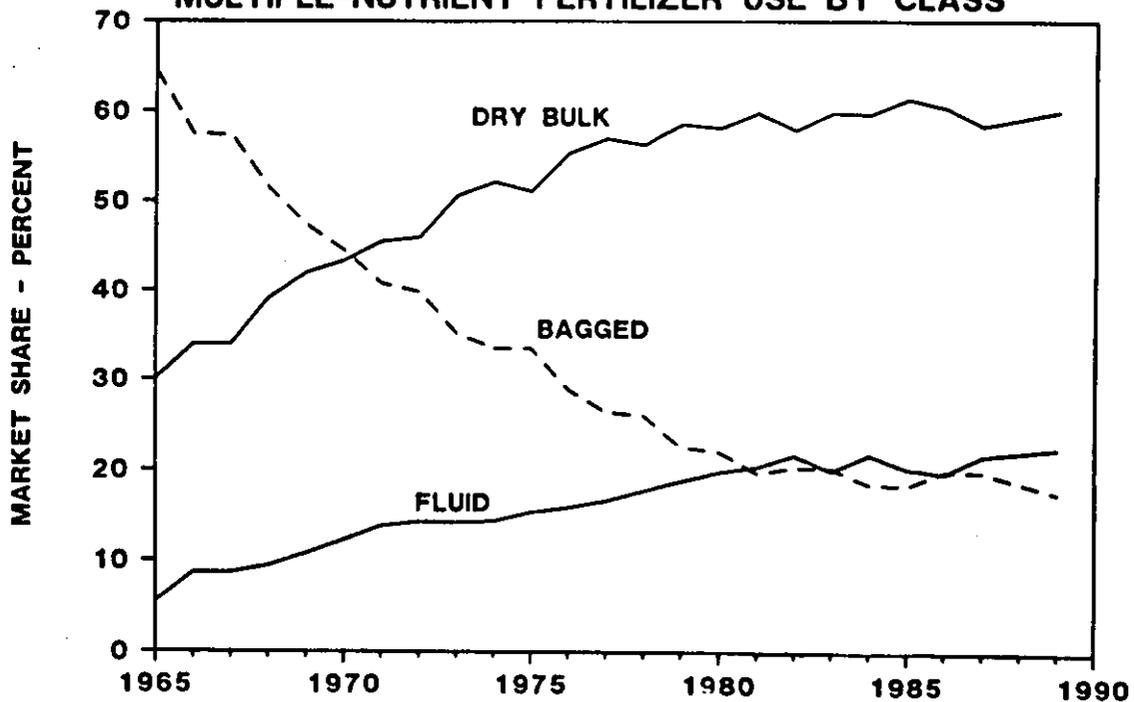


TABLE 1 - SINGLE-NUTRIENT FERTILIZERS BY CLASS
YEAR ENDED JUNE 30, 1989

% OF TOTAL 1)

STATE	BAGGED	BULK	DRY		TOTAL	% OF TOTAL 1)		DRY		
			TOTAL	FLUID		BAGGED	BULK	TOTAL	FLUID	
					SHORT TONS					
ALABAMA	35,719	179,048	214,766	74,276	289,042	12.4	61.9	74.3	25.7	
ALASKA	NA	NA	5,030	NA	5,030			100.0		
ARIZONA	3,426	42,253	45,679	190,331	236,011	1.5	17.9	19.4	80.6	
ARKANSAS	4,513	429,862	434,375	107,279	541,654	0.8	79.4	80.2	19.8	
CALIFORNIA	NA	NA	383,609	1,211,022	1,594,631			24.1	75.9	
COLORADO	35,987	90,809	126,796	240,036	366,832	9.8	24.8	34.6	65.4	
CONNECTICUT	848	1,867	2,715	328	3,043	27.9	61.3	89.2	10.8	
DELAWARE	701	19,069	19,771	38,268	58,039	1.2	32.9	34.1	65.9	
FLORIDA	21,599	113,058	134,656	73,033	207,689	10.4	54.4	64.8	35.2	
GEORGIA	28,765	147,662	176,427	335,512	511,939	5.6	28.8	34.5	65.5	
HAWAII	4,158	28,414	32,572	28,422	60,994	6.8	46.6	53.4	46.6	
IDAHO	NA	NA	318,197	143,091	461,289			69.0	31.0	
ILLINOIS	54,940	1,245,024	1,299,964	1,329,505	2,629,469	2.1	47.3	49.4	50.6	
INDIANA	5,162	492,602	497,764	663,195	1,160,959	0.4	42.4	42.9	57.1	
IOWA	NA	NA	940,008	1,292,922	2,232,929			42.1	57.9	
KANSAS	NA	NA	347,513	698,886	1,046,399			33.2	66.8	
KENTUCKY	42,934	357,661	400,595	94,823	495,418	8.7	72.2	80.9	19.1	
LOUISIANA	9,303	176,064	185,367	130,363	315,731	2.9	55.8	58.7	41.3	
MAINE	3,194	11,274	14,468	881	15,349	20.8	73.5	94.3	5.7	
MARYLAND	3,907	59,546	63,454	165,912	229,366	1.7	26.0	27.7	72.3	
MASSACHUSETTS	1,133	5,841	6,975	1,254	8,229	13.8	71.0	84.8	15.2	
MICHIGAN	2,988	413,850	416,838	220,094	636,932	0.5	65.0	65.4	34.6	
MINNESOTA	965	811,688	812,653	481,866	1,294,519	0.1	62.7	62.8	37.2	
MISSISSIPPI	26,605	240,397	267,003	166,391	433,393	6.1	55.5	61.6	38.4	
MISSOURI	3,716	921,211	924,927	319,506	1,244,434	0.3	74.0	74.3	25.7	
MONTANA	354	151,135	151,489	42,743	194,232	0.2	77.8	78.0	22.0	
NEBRASKA	NA	NA	199,858	1,075,618	1,275,477			15.7	84.3	
NEVADA	1,622	3,467	5,089	5,715	10,804	15.0	32.1	47.1	52.9	
NEW HAMPSHIRE	407	6,711	7,119	28	7,146	5.7	93.9	99.6	0.4	
NEW JERSEY	7,226	12,422	19,648	12,447	32,095	22.5	38.7	61.2	38.8	
NEW MEXICO	2,414	33,547	35,961	50,959	86,920	2.8	38.6	41.4	58.6	
NEW YORK	19,075	97,932	117,007	46,285	163,292	11.7	60.0	71.7	28.3	
NORTH CAROLINA	57,633	180,390	238,023	338,314	576,337	10.0	31.3	41.3	58.7	
NORTH DAKOTA	NA	NA	123,145	164,189	287,334			42.9	57.1	
OHIO	9,617	524,550	534,167	501,403	1,035,570	0.9	50.7	51.6	48.4	
OKLAHOMA	3,678	310,620	314,298	376,968	691,266	0.5	44.9	45.5	54.5	
OREGON	NA	NA	269,002	150,224	419,227			64.2	35.8	
PENNSYLVANIA	91,932	71,603	163,535	59,218	222,754	41.3	32.1	73.4	26.6	
RHODE ISLAND	326	1,107	1,433	19	1,452	22.5	76.2	98.7	1.3	
SOUTH CAROLINA	12,915	34,914	47,829	148,548	196,376	6.6	17.8	24.4	75.6	
SOUTH DAKOTA	187	256,811	256,998	127,318	384,316	0.0	66.8	66.9	33.1	
TENNESSEE	26,720	358,159	384,878	48,112	432,990	6.2	82.7	88.9	11.1	
TEXAS	20,909	490,868	511,777	852,313	1,364,089	1.5	36.0	37.5	62.5	
UTAH	NA	NA	61,503	17,462	78,965			77.9	22.1	
VERMONT	NA	NA	4,459	1,146	5,605			79.6	20.4	
VIRGINIA	8,414	35,276	43,691	96,196	139,887	6.0	25.2	31.2	68.8	
WASHINGTON	NA	NA	281,857	339,766	621,624			45.3	54.7	
WEST VIRGINIA	7,347	9,243	16,590	5,036	21,626	34.0	42.7	76.7	23.3	
WISCONSIN	295	680,657	680,952	230,489	911,441	0.0	74.7	74.7	25.3	
WYOMING	3,245	25,992	29,237	20,250	49,486	6.6	52.5	59.1	40.9	
PUERTO RICO	NA	NA	7,808	NA	7,808			100.0		
TOTAL	564,879	9,072,607	12,579,476	12,717,961	25,297,438	2.9	46.8	49.7	50.3	

1) TOTALS ADJUSTED FOR STATES NOT REPORTING BAG/BULK TONS.
FERTILIZER USE BY CLASS, JANUARY 1990

TVA, ECONOMICS AND MARKETING

TABLE 2 - MULTIPLE-NUTRIENT FERTILIZERS BY CLASS
YEAR ENDED JUNE 30, 1989

STATE	% OF TOTAL 11				TOTAL	% OF TOTAL 11			
	BAGGED	BULK	DRY TOTAL	FLUID		BAGGED	BULK	DRY TOTAL	FLUID
SHORT TONS					%				
ALABAMA	102,635	201,846	304,481	37,047	341,528	30.1	59.1	89.2	10.8
ALASKA	NA	NA	5,580	NA	5,580			100.0	
ARIZONA	3,941	70,880	74,821	40,399	115,220	3.4	61.5	64.9	35.1
ARKANSAS	13,733	294,090	307,823	41,794	349,618	3.9	84.1	88.0	12.0
CALIFORNIA	NA	NA	492,113	362,236	854,349			57.6	42.4
COLORADO	33,726	41,840	75,566	57,287	132,853	25.4	31.5	56.9	43.1
CONNECTICUT	22,622	4,043	26,665	1,741	28,406	79.6	14.2	93.9	6.1
DELAWARE	3,953	32,733	36,686	11,224	47,910	8.3	68.3	76.6	23.4
FLORIDA	334,028	1,124,054	1,458,082	317,636	1,775,718	18.8	63.3	82.1	17.9
GEORGIA	115,933	594,761	710,694	139,323	850,016	13.6	70.0	83.6	16.4
HAWAII	13,834	29,827	43,661	23,919	67,580	20.5	44.1	64.6	35.4
IDAHO	NA	NA	151,309	45,036	196,346			77.1	22.9
ILLINOIS	57,124	666,222	723,345	232,188	955,533	6.0	69.7	75.7	24.3
INDIANA	60,489	512,620	573,109	339,970	913,079	6.6	56.1	62.8	37.2
IOWA	NA	NA	559,248	224,324	783,572			71.4	28.6
KANSAS	NA	NA	238,357	96,126	334,483			71.3	28.7
KENTUCKY	109,420	205,578	314,997	9,611	324,608	33.7	63.3	97.0	3.0
LOUISIANA	24,387	197,343	221,730	87,829	309,559	7.9	63.7	71.6	28.4
MAINE	23,250	39,589	62,839	1,652	64,491	36.1	61.4	97.4	2.6
MARYLAND	32,147	78,650	110,798	33,895	144,693	22.2	54.4	76.6	23.4
MASSACHUSETTS	33,909	5,069	38,978	2,775	41,753	81.2	12.1	93.4	6.6
MICHIGAN	32,596	389,538	422,134	70,273	492,407	6.6	79.1	85.7	14.3
MINNESOTA	41,094	485,201	526,295	93,499	619,794	6.6	78.3	84.9	15.1
MISSISSIPPI	38,370	171,349	209,719	30,578	240,297	16.0	71.3	87.3	12.7
MISSOURI	51,614	312,003	363,617	69,245	432,861	11.9	72.1	84.0	16.0
MONTANA	840	131,939	132,779	3,885	136,664	0.6	96.5	97.2	2.8
NEBRASKA	NA	NA	206,646	233,884	440,530			46.9	53.1
NEVADA	7,012	2,355	9,367	1,241	10,607	66.1	22.2	88.3	11.7
NEW HAMPSHIRE	9,122	2,248	11,370	873	12,244	74.5	18.4	92.9	7.1
NEW JERSEY	70,026	51,061	121,087	19,180	140,267	49.9	36.4	86.3	13.7
NEW MEXICO	3,899	24,655	28,554	6,965	35,519	11.0	69.4	80.4	19.6
NEW YORK	157,832	156,412	314,244	45,544	359,788	43.9	43.5	87.3	12.7
NORTH CAROLINA	353,145	339,393	692,538	122,347	814,885	43.3	41.6	85.0	15.0
NORTH DAKOTA	NA	NA	300,939	26,208	327,147			92.0	8.0
OHIO	60,207	323,281	383,489	123,623	507,112	11.9	63.7	75.6	24.4
OKLAHOMA	26,658	226,761	253,419	19,421	272,840	9.8	83.1	92.9	7.1
OREGON	7,528	122,199	129,727	12,802	142,529	5.3	85.7	91.0	9.0
PENNSYLVANIA	170,266	97,659	267,925	30,888	298,813	57.0	32.7	89.7	10.3
RHODE ISLAND	3,871	7,686	11,557	4	11,561	33.5	66.5	100.0	0.0
SOUTH CAROLINA	78,633	212,529	291,162	35,254	326,416	24.1	65.1	89.2	10.8
SOUTH DAKOTA	2,667	162,018	164,685	46,572	211,257	1.3	76.7	78.0	22.0
TENNESSEE	94,742	180,578	275,320	9,625	284,945	33.2	63.4	96.6	3.4
TEXAS	186,165	852,507	1,038,672	617,150	1,655,823	11.2	51.5	62.7	37.3
UTAH	NA	NA	18,750	1,339	20,089			93.3	6.7
VERMONT	NA	NA	22,294	93	22,387			99.6	0.4
VIRGINIA	114,628	205,139	319,767	116,650	436,417	26.3	47.0	73.3	26.7
WASHINGTON	NA	NA	115,783	30,567	146,350			79.1	20.9
WEST VIRGINIA	26,987	6,164	33,151	562	33,713	80.1	18.3	98.3	1.7
WISCONSIN	49,815	263,695	313,510	60,975	374,485	13.3	70.4	83.7	16.3
WYOMING	1,894	8,529	10,422	916	11,338	16.7	75.2	91.9	8.1
PUERTO RICO	NA	NA	89,820	NA	89,820			100.0	
TOTAL	2,574,742	8,834,045	13,609,625	3,936,176	17,545,800	17.5	60.1	77.6	22.4

11 TOTALS ADJUSTED FOR STATES NOT REPORTING BAG/BULK TONS.
FERTILIZER USE BY CLASS, JANUARY 1990

TVA, ECONOMICS AND MARKETING

TABLE 3 - SINGLE AND MULTIPLE-NUTRIENT FERTILIZERS BY CLASS
YEAR ENDED JUNE 30, 1989

% OF TOTAL 1)

STATE	BAGGED	BULK	DRY		TOTAL	BAGGED	BULK	DRY	
			TOTAL	FLUID				TOTAL	FLUID
SHORT TONS					%				
ALABAMA	138,353	380,894	519,247	111,322	630,570	21.9	60.4	82.3	17.7
ALASKA	NA	NA	10,610	NA	10,610			100.0	
ARIZONA	7,367	113,133	120,500	230,730	351,230	2.1	32.2	34.3	65.7
ARKANSAS	18,246	723,953	742,198	149,073	891,272	2.0	81.2	83.3	16.7
CALIFORNIA	NA	NA	875,722	1,573,258	2,448,980			35.8	64.2
COLORADO	69,713	132,649	202,362	297,323	499,685	14.0	26.5	40.5	59.5
CONNECTICUT	23,470	5,910	29,379	2,069	31,449	74.6	18.8	93.4	6.6
DELAWARE	4,654	51,802	56,457	49,492	105,949	4.4	48.9	53.3	46.7
FLORIDA	355,626	1,237,112	1,592,738	390,669	1,983,407	17.9	62.4	80.3	19.7
GEORGIA	144,698	742,423	887,121	474,834	1,361,955	10.6	54.5	65.1	34.9
HAWAII	17,991	58,241	76,233	52,341	128,574	14.0	45.3	59.3	40.7
IDAHO	NA	NA	469,506	188,128	657,634			71.4	28.6
ILLINOIS	112,064	1,911,246	2,023,310	1,561,693	3,585,002	3.1	53.3	56.4	43.6
INDIANA	65,651	1,005,222	1,070,874	1,003,164	2,074,038	3.2	48.5	51.6	48.4
IOWA	NA	NA	1,499,256	1,517,245	3,016,502			49.7	50.3
KANSAS	NA	NA	585,870	795,012	1,380,882			42.4	57.6
KENTUCKY	152,353	563,239	715,593	104,434	820,027	18.6	68.7	87.3	12.7
LOUISIANA	33,690	373,407	407,098	218,192	625,290	5.4	59.7	65.1	34.9
MAINE	26,444	50,863	77,307	2,533	79,840	33.1	63.7	96.8	3.2
MARYLAND	36,055	138,197	174,251	199,807	374,059	9.6	36.9	46.6	53.4
MASSACHUSETTS	35,043	10,910	45,953	4,029	49,982	70.1	21.8	91.9	8.1
MICHIGAN	35,584	803,388	838,972	290,367	1,129,339	3.2	71.1	74.3	25.7
MINNESOTA	42,059	1,296,889	1,338,948	575,365	1,914,313	2.2	67.7	69.9	30.1
MISSISSIPPI	64,976	411,746	476,722	196,969	673,691	9.6	61.1	70.8	29.2
MISSOURI	55,329	1,233,214	1,288,544	388,751	1,677,295	3.3	73.5	76.8	23.2
MONTANA	1,194	283,074	284,268	46,628	330,896	0.4	85.5	85.9	14.1
NEBRASKA	NA	NA	406,504	1,309,503	1,716,007			23.7	76.3
NEVADA	8,634	5,822	14,456	6,955	21,411	40.3	27.2	67.5	32.5
NEW HAMPSHIRE	9,529	8,960	18,489	901	19,390	49.1	46.2	95.4	4.6
NEW JERSEY	77,252	63,483	140,735	31,628	172,362	44.8	36.8	81.7	18.3
NEW MEXICO	6,313	58,202	64,515	57,924	122,439	5.2	47.5	52.7	47.3
NEW YORK	176,907	254,344	431,251	91,829	523,080	33.8	48.6	82.4	17.6
NORTH CAROLINA	410,778	519,783	930,561	460,661	1,391,222	29.5	37.4	66.9	33.1
NORTH DAKOTA	NA	NA	424,084	190,397	614,481			69.0	31.0
OHIO	69,824	847,832	917,656	625,026	1,542,682	4.5	55.0	59.5	40.5
OKLAHOMA	30,335	537,381	567,717	396,389	964,105	3.1	55.7	58.9	41.1
OREGON	7,528	391,201	398,729	163,027	561,756	1.3	69.6	71.0	29.0
PENNSYLVANIA	262,198	169,262	431,461	90,106	521,567	50.3	32.5	82.7	17.3
RHODE ISLAND	4,197	8,793	12,990	23	13,013	32.3	67.6	99.8	0.2
SOUTH CAROLINA	91,548	247,443	338,991	183,801	522,792	17.5	47.3	64.8	35.2
SOUTH DAKOTA	2,853	418,829	421,683	173,890	595,573	0.5	70.3	70.8	29.2
TENNESSEE	121,462	538,736	660,198	57,737	717,935	16.9	75.0	92.0	8.0
TEXAS	207,074	1,343,375	1,550,449	1,469,463	3,019,912	6.9	44.5	51.3	48.7
UTAH	NA	NA	80,253	18,801	99,054			81.0	19.0
VERMONT	NA	NA	26,753	1,239	27,992			95.6	4.4
VIRGINIA	123,042	240,415	363,458	212,846	576,303	21.4	41.7	63.1	36.9
WASHINGTON	NA	NA	397,640	370,334	767,974			51.8	48.2
WEST VIRGINIA	34,334	15,407	49,741	5,598	55,339	62.0	27.8	89.9	10.1
WISCONSIN	50,110	944,352	994,462	291,464	1,285,927	3.9	73.4	77.3	22.7
WYOMING	5,138	34,521	39,659	21,165	60,824	8.4	56.8	65.2	34.8
PUERTO RICO	NA	NA	97,628	NA	97,628			100.0	
TOTAL	3,139,621	18,175,654	26,189,101	16,654,137	42,843,238	9.0	52.1	61.1	38.9

1) TOTALS ADJUSTED FOR STATES NOT REPORTING BAG/BULK TONS.
FERTILIZER USE BY CLASS, JANUARY 1990

TVA, ECONOMICS AND MARKETING