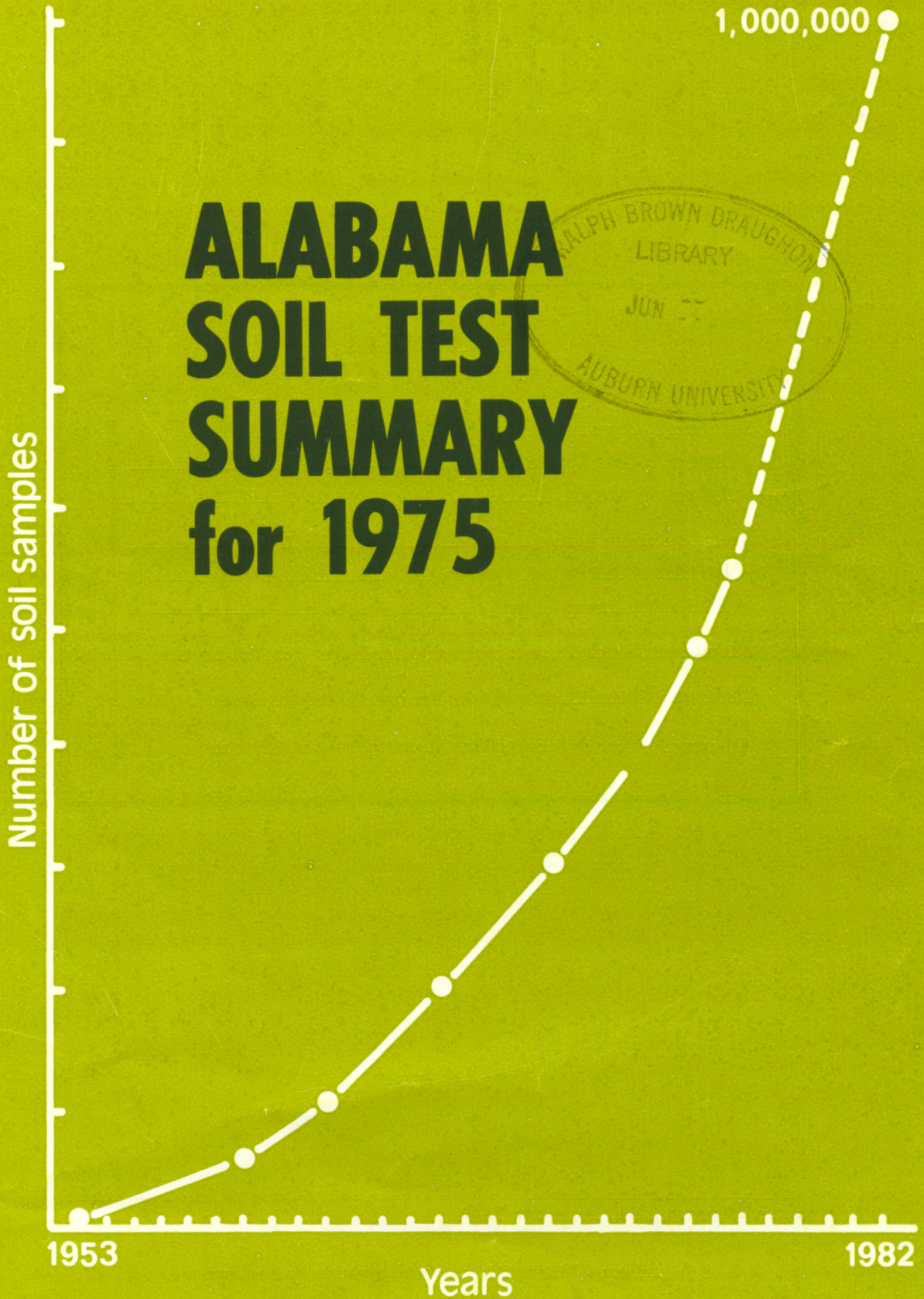


ALABAMA SOIL TEST SUMMARY for 1975



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ALABAMA SOIL TEST SUMMARY FOR 1975

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The Auburn University Soil Testing Program is a joint effort of the Agricultural Experiment Station and the Alabama Cooperative Extension Service. The Extension Service distributes soil test supplies and provides educational and promotional services to residents throughout the state. The Experiment Station operates the laboratory and conducts fertility research on substations, experiment fields, and on fields of cooperating farmers to obtain information on which to base fertilizer and lime recommendations made by the laboratory.

Soil test results and recommendations are recorded by the computer throughout each fiscal year, July 1 through June 30. At the year's end, they are summarized to show the many relationships among soil test values, soil groups, and crops to be grown for each county and for the entire State. The most recent state summary published was in Agronomy and Soils Departmental Series No. 15 for 1972 and 1973. The present publication includes data from 59,503 samples analyzed from July 1, 1974 through June 30, 1975. These data are quite similar to those from 47,000 samples analyzed in 1973-74.

The laboratory has been in operation for 23 years. The graph on the cover indicates the cumulative total and projects the anticipated number of samples for the next 7 years. During the first 15 years one-quarter of a million samples were tested. Seven years later, the second quarter million mark was reached. If samples continue at the

present rate, one million will be reached in 1982. If the number of samples continues to increase as it has in the past 2 years, the million sample mark will be reached much sooner. The millionth sample has no particular significance; however, the increasing numbers indicate the acceptance and success of the program.

The reasons for the recent increase in interest in soil testing probably include fertilizer prices, increased home gardening, and shifts in cropping patterns such as has occurred with cotton between Districts II and I. It may also indicate that the public is more aware of the service available and has more confidence in the information obtained.

The computerized program used by the laboratory provides a summary of several types of information about the samples received. This summary indicates the interest in the program in the various areas of the State. It allows for the identification of crops produced, the soil fertility problems most frequently encountered and the kinds and amount of fertilizer and lime needed to correct the fertility problems indicated by the soil tests.

The importance of homeowner samples is indicated by the fact that three of the ten leading counties in 1975 were Jefferson, Mobile, and Montgomery as shown in Table 1. All of the other top ten were in extension districts I and II, which include the principle row crop areas in the State.

TABLE 1. THE RELATIVE RANK OF THE LEADING COUNTIES IN NUMBER OF SOIL SAMPLES SUBMITTED

Rank	1953-1967	1968-1972	1973	1974	1975
1	Houston	Jefferson	Jefferson	Jefferson	Houston
2	Geneva	Montgomery	Houston	Houston	Jefferson
3	Limestone	Houston	Coffee	Coffee	Coffee
4	Coffee	Pike	Pike	Henry	Geneva
5	Barbour	Dallas	Dallas	Pike	Henry
6	Pike	Henry	Geneva	Dallas	Madison
7	Madison	Madison	Henry	Montgomery	Barbour
8	Montgomery	Coffee	Mobile	Geneva	Mobile
9	Jefferson	Geneva	Montgomery	Madison	Covington
10	Morgan	Lee	Lee	Mobile	Montgomery
11				Barbour	Pike
12				Autauga	Dallas

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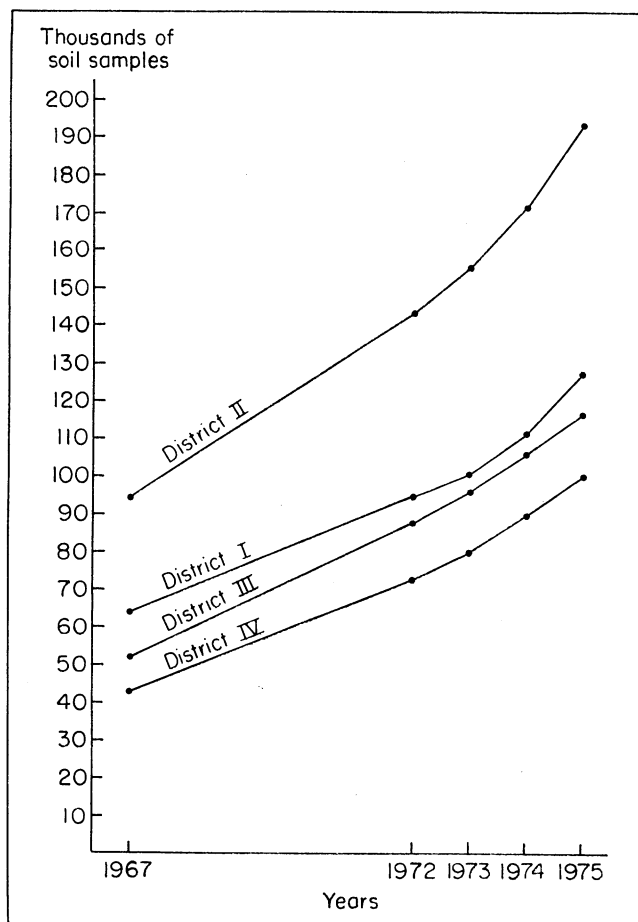


FIG. Cumulative number of samples received from each district.

Participation in soil testing is greatest in the Wiregrass area in District II, as shown in the figure. Thirty-seven percent of all soil samples received in 1975 were from this district. Thirty-six percent of the cumulative 23-year total have come from this peanut producing area. The number received from District I (Tennessee Valley) is increasing at a rate that almost parallels the increase shown in District II in the last 2 years. Twenty-seven percent of all samples received in 1975 were from District II, while the cumulative percentage for 23 years is 24 percent. These two districts together have submitted 60 percent of all samples, while in 1975 they submitted 64 percent. Tables 2-5 give the cumulative number of samples from each district for the past 23 years.

SOIL-TEST RATINGS FOR PHOSPHORUS, POTASSIUM, AND MAGNESIUM

Ratings by Soil Groups

Response to fertilizers and lime varies among soils. The amount and kind of clay and the amount of organic matter in soils are the principal factors that cause soils to vary in their response. When soil samples are received in the laboratory, they are classified into five soil groups. These groups may be briefly described as follows:

Group	Brief description	Cation exchange capacity* Meq/100 g
1	Sandy soils of the Coastal Plain	Less than 5
2	Loams and light clays	5 to 10
3	Clay soils of the Black Belt	More than 15
4	Sandy loams of North Alabama	5 to 10
5	Red clays of the Limestone Valleys	10 to 15

* The cation exchange capacity is determined by the clay and organic matter content.

The number and percentage of samples as rated for P, K, and Mg are presented in Table 6. Only those samples rated *Very Low*, *Low*, or *Medium* can be expected to respond to fertilizer. Samples rated *High* or *Very High* have adequate amounts of the nutrient rated to produce top yields without addition of the element and none is recommended. Where none is applied, soils should be sampled each year to prevent any loss in yield.

The P ratings show the influence of past fertilizer applications in building up soil P on many soils. Over half (51 percent) of all samples were H, VH, or EH in P, compared to 50 percent in 1974 and 52 percent in 1973. Soil groups 1, 2, and 4 were close to this average, while of the Black Belt clayey soils of Group 3, 75 percent would be expected to respond to P. Over 60 percent of the red clayey soils of the Tennessee Valley were H or VH in P.

The ratings for K show that 57 percent of all samples were VL, L, or M and would be expected to respond. Groups 1, 2, and 5 are near the State average while of the Sand Mountain soils in Group 4, 65 percent would be expected to respond to K. Only 47 percent of the Black Belt soils of Group 3 needed K.

Based on anticipated response to Mg (magnesium), soils are divided into only two groups, Low and High. Only 16 percent of samples were low. Most of these were the sandy soils of the coastal plain and the Sand Mountain area of Northeast Alabama. Many crops have not shown a need for added Mg on Alabama soils. On all crops, however, dolomite is recommended when Mg is low, and lime is needed. Of Group 4 soils, 40 percent was low in Mg; Group 1, 18 percent, and Group 5 the lowest at 2 percent. Groups 2 and 3 were intermediate at 11 and 8 percent.

The varying proportions of responsive soils in the groups indicate that fertilizer needs will vary considerably from one soil area to another, a fact that is widely recognized. The State cannot be considered to be a uniform market area. Fertilizer materials should be mixed to meet the needs of the area. The summary offers an insight into the combinations of P and K that are needed in the State.

Ratings by Crops

Crops vary in their requirements for P, K, and Mg. Soils are rated based on the crop to be grown, and fertilizer recommendations are based on these ratings. Soils rated VL will produce less than 50 percent of their potential if the element is not applied. *Low* soils should yield 50 to 75 percent of maximum and M soils 75 to 100 percent. *High* soils have adequate P or K to produce top yields, while VH indicates that the soil contains more than twice the amount needed. *Extremely High* soils have more than four times the amount needed and further additions may be detrimental.

TABLE 2. NUMBER OF SAMPLES RECEIVED AND PERCENT OF STATE TOTAL BY COUNTY AND BY DISTRICT, JULY 1, 1974 THROUGH JUNE 30, 1975—DISTRICT 1

County	1953-67		1968-72		1973		1974		1975		23 years	
	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
Blount.....	2,503	1.0	1,736	1.2	352	1.1	744	1.6	912	1.5	6,247	1.2
Cherokee.....	3,833	1.5	1,839	1.3	423	1.3	395	0.8	1,042	1.8	7,532	1.4
Colbert.....	2,428	1.0	1,384	0.9	302	0.9	653	1.4	798	1.3	5,565	1.0
Cullman.....	3,214	1.3	1,766	1.2	538	1.6	623	1.3	888	1.5	7,029	1.3
DeKalb.....	5,096	2.0	2,580	1.8	444	1.3	906	1.9	1,141	1.9	10,167	1.9
Etowah.....	2,508	1.0	2,028	1.4	303	0.9	493	1.0	824	1.4	6,156	1.1
Franklin.....	3,078	1.2	1,288	0.9	159	0.5	241	0.5	615	1.0	5,381	1.0
Jackson.....	2,943	1.2	1,842	1.3	446	1.4	933	2.0	1,012	1.7	7,176	1.3
Lauderdale.....	6,706	2.3	2,909	2.0	618	1.9	814	1.7	972	1.6	12,019	2.2
Lawrence.....	2,025	0.8	1,413	1.0	383	1.2	618	1.3	1,214	2.0	5,653	1.0
Limestone.....	10,247	4.1	2,375	1.6	702	2.1	783	1.7	1,171	2.0	15,278	2.8
Madison.....	6,979	2.8	4,192	2.9	769	2.3	1,330	2.8	1,641	2.8	14,911	2.8
Marion.....	1,678	0.7	1,119	0.8	199	0.6	321	0.7	461	0.8	3,778	0.7
Marshall.....	3,170	1.3	1,503	1.0	389	1.2	820	1.7	1,151	1.9	7,033	1.3
Morgan.....	6,369	2.5	2,476	1.7	444	1.3	675	1.4	1,279	2.1	11,243	2.1
Winston.....	888	0.4	713	0.5	191	0.6	212	0.5	381	0.6	2,385	0.4
District total.....	63,665	25.2	31,163	21.2	6,662	20.2	10,561	22.5	15,502	26.1	127,553	23.7
State total.....	252,815	100.0	146,834	100.0	32,942	100.0	46,963	100.0	59,503	100.0	539,057	100.0

TABLE 3. NUMBER OF SAMPLES RECEIVED AND PERCENT OF STATE TOTAL BY COUNTY AND BY DISTRICT, JULY 1, 1974 THROUGH JUNE 30, 1975—DISTRICT 2

County	1953-67		1968-72		1973		1974		1975		23 years	
	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
Barbour.....	9,029	3.6	3,110	2.1	727	2.2	1,193	2.5	1,582	2.7	15,639	2.9
Bullock.....	3,131	1.2	1,827	1.2	291	0.9	467	1.0	731	1.2	6,447	1.2
Chambers.....	1,758	0.7	1,697	1.2	337	1.0	330	0.7	591	1.0	4,713	0.9
Coffee.....	8,982	3.6	4,107	2.8	1,262	3.8	1,718	3.7	2,240	3.8	18,309	3.4
Coosa.....	765	0.3	443	0.3	62	0.2	155	0.3	144	0.2	1,569	0.3
Covington.....	6,148	2.4	3,158	2.2	611	1.9	1,020	2.2	1,467	2.5	12,404	2.3
Crenshaw.....	2,977	1.2	1,720	1.2	438	1.3	713	1.5	842	1.4	6,690	1.2
Dale.....	5,590	2.2	2,477	1.7	669	2.0	802	1.7	1,248	2.1	10,786	2.0
Elmore.....	4,484	1.8	2,414	1.6	440	1.3	611	1.3	877	1.5	8,826	1.6
Geneva.....	10,639	4.2	4,053	2.8	1,166	3.5	1,334	2.8	2,117	3.6	19,309	3.6
Henry.....	8,501	3.4	4,672	3.2	1,154	3.5	1,525	3.2	2,021	3.4	17,873	3.3
Houston.....	11,503	4.5	5,495	3.7	1,488	4.5	2,314	4.9	3,706	6.2	24,506	4.5
Lee.....	5,170	2.0	3,893	2.7	840	2.5	968	2.1	1,120	1.9	11,991	2.2
Macon.....	3,154	1.2	2,544	1.7	481	1.5	685	1.5	688	1.2	7,552	1.4
Pike.....	8,179	3.2	5,178	3.5	1,256	3.8	1,486	3.2	1,392	2.3	17,491	3.2
Russell.....	2,097	0.8	1,427	1.0	349	1.1	470	1.0	551	0.9	4,894	0.9
Tallapoosa.....	2,512	1.0	1,026	0.7	244	0.7	454	1.0	319	0.5	4,555	0.8
District total.....	94,619	37.4	49,241	33.5	11,815	35.9	16,245	34.6	21,634	36.4	193,554	35.9
State total.....	252,851	100.0	146,834	100.0	32,942	100.0	46,963	100.0	59,503	100.0	539,057	100.0

TABLE 4. NUMBER OF SAMPLES RECEIVED AND PERCENT OF STATE TOTAL BY COUNTY AND BY DISTRICT, JULY 1, 1974 THROUGH JUNE 30, 1975—DISTRICT 3

County	1953-67		1968-72		1973		1974		1975		23 years	
	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
Baldwin.....	4,132	1.6	3,535	2.4	673	2.0	838	1.8	1,023	1.7	10,201	1.9
Butler.....	3,084	1.2	872	0.6	185	0.6	353	0.8	302	0.5	4,796	0.9
Choctaw.....	1,516	0.6	1,145	0.8	179	0.5	302	0.6	287	0.5	3,429	0.6
Clarke.....	1,001	0.4	1,085	0.7	155	0.5	399	0.8	339	0.6	2,979	0.6
Conecuh.....	2,865	1.1	1,241	0.8	210	0.6	361	0.8	649	1.1	5,326	1.0
Dallas.....	5,957	2.4	4,899	3.3	1,173	3.6	1,396	3.0	1,350	2.3	14,775	2.7
Escambia.....	1,978	0.8	846	0.6	410	1.2	356	0.8	780	1.3	4,370	0.8
Hale.....	2,702	1.1	1,566	1.1	339	1.0	370	0.8	407	0.7	5,384	1.0
Lowndes.....	2,921	1.2	2,379	1.6	394	1.2	468	1.0	551	0.9	6,713	1.2
Marengo.....	3,404	1.3	2,525	1.7	541	1.6	641	1.4	535	0.9	7,646	1.4
Mobile.....	4,175	1.7	3,524	2.0	966	2.9	1,169	2.5	1,572	2.6	11,406	2.1
Monroe.....	2,464	1.0	1,087	0.7	220	0.7	626	1.3	590	1.0	4,987	0.9
Montgomery.....	6,914	2.7	5,875	4.0	871	2.6	1,314	2.8	1,394	2.3	16,368	3.0
Perry.....	2,502	1.0	1,587	1.1	484	1.5	505	1.1	397	0.7	5,493	1.0
Sumter.....	2,488	1.0	1,518	1.0	319	1.0	507	1.1	441	0.7	5,273	1.0
Washington.....	1,035	0.4	821	0.6	188	0.6	367	0.8	276	0.5	2,687	0.5
Wilcox.....	2,473	1.0	1,643	1.1	449	1.4	372	0.8	593	1.0	5,530	1.0
District total.....	51,629	20.0	36,148	24.6	7,756	23.5	10,344	22.0	11,486	19.3	117,363	21.8
State total.....	252,815	100.0	146,834	100.0	32,942	100.0	46,963	100.0	59,503	100.0	539,057	100.0

TABLE 5. NUMBER OF SAMPLES RECEIVED AND PERCENT OF STATE TOTAL BY COUNTY AND BY DISTRICT, JULY 1, 1974 THROUGH JUNE 10, 1975—DISTRICT 4

County	1953-67		1968-72		1973		1974		1975		23 years	
	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
Autauga	4,251	1.7	3,577	2.4	897	2.7	1,186	2.5	1,001	1.7	10,912	2.0
Bibb	1,862	0.7	1,060	0.7	246	0.7	424	0.9	284	0.5	3,876	0.7
Calhoun	2,585	1.0	1,563	1.1	394	1.2	517	1.1	648	1.1	5,707	1.1
Chilton	1,933	0.8	1,603	1.1	529	1.6	504	1.1	690	1.2	5,259	1.0
Clay	1,285	0.5	906	0.6	90	0.3	203	0.4	169	0.3	2,653	0.5
Cleburne	899	0.4	620	0.4	83	0.3	126	0.3	157	0.3	1,885	0.3
Fayette	1,917	0.8	841	0.6	196	0.6	181	0.4	271	0.5	3,406	0.6
Greene	2,654	1.0	1,623	1.1	328	1.0	444	0.9	401	0.7	5,450	1.0
Jefferson	6,500	2.6	6,527	4.4	1,583	4.8	2,494	5.3	2,610	4.4	19,714	3.7
Lamar	2,595	1.0	1,064	0.7	147	0.4	426	0.9	372	0.6	4,604	0.9
Pickens	2,141	0.8	1,291	0.9	248	0.8	468	1.0	498	0.8	4,646	0.9
Randolph	1,372	0.5	882	0.6	175	0.5	228	0.5	323	0.5	2,980	0.6
Shelby	2,786	1.1	1,321	0.9	209	0.6	421	0.9	728	1.2	5,465	1.0
St. Clair	1,937	0.8	1,369	0.9	220	0.7	420	0.9	522	0.9	4,468	0.8
Talladega	2,346	0.9	1,479	1.0	401	1.2	529	1.1	549	0.9	5,304	1.0
Tuscaloosa	4,398	1.7	3,296	2.2	691	2.1	885	1.9	1,218	2.0	10,488	1.9
Walker	1,441	0.6	1,260	0.9	272	0.8	357	0.8	440	0.7	3,770	0.7
District total	42,902	17.0	30,282	20.6	6,709	20.4	9,813	20.9	10,881	18.3	100,587	18.7
State total	252,815	100.0	146,834	100.0	32,942	100.0	46,963	100.0	59,503	100.0	539,057	100.0

A summary of ratings by crops is presented in Table 7. Ratings for field crops and horticultural crops are summarized separately in the last four lines of the table. In September 1974, recommendations were changed so that P and K are no longer recommended for field and forage crops testing H. Thus only 57 percent of these samples would have received a P recommendation in 1975. Even though a recommendation of a maintenance application for horticultural crops is continued at H, only 47 percent would get a P recommendation because 53 percent of these samples were VH or EH. Percentages needing P for the various crops can be calculated from data in the table. As an example, 66 percent of samples for cotton were H, VH, or EH in P and would not get a P recommendation.

The summary of K data for field crops shows that 57 percent of samples were VL, L, or M and needed K fertilization. The remaining 43 percent were H or VH. For horticultural crops, 91 percent needed K since only the 9 percent that were VH would not get a K recommendation.

The summary for Mg shows that 82 percent of field crop samples and 89 percent of horticultural samples were H in Mg. This means that if these samples needed lime, calcitic lime would be satisfactory. The other 18 and 11 percent respectively would need dolomitic limestone or some other source of Mg for most crops.

SOIL pH DISTRIBUTION

Distribution among Soil Groups (Table 8)

Soils that are high in clay or organic matter require more lime to raise the pH to 6.5 than do sandy soils that are low in organic matter. Clay soils will produce top yields at lower pH levels than will sandy soils. Lime is recommended for most crops on Group 1, 2, and 4 soils if the pH is below 5.8. On Group 3 and 5 soils, lime is usually not recommended unless the pH is below 5.6.

Low pH is generally considered to be the most important fertility problem in Alabama. This problem is most prevalent in the Sand Mountain area where 67 percent of samples were below pH 5.8. This was followed closely by the sandy soils of the coastal plain where 58 percent needed lime. Only 31 percent of the red clay soils of the limestone valleys were below pH 5.5 and received a lime recommendation. Almost 90 percent of the clay soils of the Black Belt were high in pH and did not need lime. The acid clay soils from the Black Belt were classified in Group 5 during the first few months of this year.

These data demonstrate why it is important that a soil test be made before lime is applied. Of all samples received, 53 percent needed lime; and without a soil test, the need for lime cannot be accurately predicted.

TABLE 6. SAMPLES RATED BY P, K AND Mg LEVELS FOR EACH SOIL GROUP

Soil group	Phosphorus						Potassium					Magnesium		Total	Percent
	VL	L	M	H	VH	EH	VL	L	M	H	VH	L	H		
1	2,003	3,041	7,200	8,173	3,250	1,591	565	3,689	9,887	9,024	2,093	4,494	20,764	25,258	42.4
Percent	7.9	12.0	28.5	32.4	12.9	6.3	2.2	14.6	39.1	35.7	8.3	17.8	82.2	100.0	
2	4,082	3,403	4,774	4,395	2,816	3,467	435	3,029	9,473	8,190	1,891	2,547	20,390	22,937	38.5
Percent	17.8	14.8	20.8	19.2	12.3	15.1	1.9	13.2	41.3	35.4	8.2	11.1	88.9	100.0	
3	554	436	386	264	127	106	52	340	497	681	303	153	1,720	1,873	3.1
Percent	29.6	23.3	20.6	14.1	6.8	5.7	2.8	18.2	26.5	36.4	16.2	8.2	91.8	100.0	
4	671	754	1,412	1,599	1,007	519	80	852	2,940	1,795	295	2,353	3,609	5,962	10.0
Percent	11.3	12.6	23.7	26.8	16.9	8.7	1.3	14.3	49.3	30.1	4.9	39.5	60.5	100.0	
5	256	375	719	992	592	539	19	398	1,605	1,248	203	65	3,408	3,473	5.8
Percent	7.4	10.8	20.7	28.6	17.0	15.5	0.5	11.5	46.2	35.9	5.8	1.9	98.1	100.0	
Total	7,566	8,009	14,491	15,423	7,792	6,222	1,151	8,308	24,402	20,857	4,785	9,612	49,891	59,503	100.0
Percent	12.7	13.5	24.4	25.9	13.1	10.5	1.9	14.0	41.0	35.1	8.0	16.2	83.8	100.0	

TABLE 7. SAMPLES RATED BY P, K, AND Mg LEVELS FOR EACH CROP

Crop	Phosphorus						Potassium					Magnesium		Total
	VL	L	M	H	VH	EH	VL	L	M	H	VH	L	H	
Corn	525	1,319	3,115	3,218	956	141	30	582	3,531	4,130	1,001	2,481	6,793	9,274
Cotton	122	376	1,211	1,930	1,222	174	17	294	2,586	2,028	110	572	4,463	5,035
Peanuts	199	670	1,936	1,933	438	25	106	873	2,362	1,644	216	994	4,207	5,201
Soybeans	733	1,073	1,779	1,687	639	179	96	1,176	3,002	1,607	209	1,008	5,082	6,090
Clover-Winter Grass	1,339	729	712	580	273	155	184	1,035	1,570	833	166	497	3,291	3,788
Clover-Summer Grass	197	129	191	149	62	26	33	159	286	237	39	48	706	754
Legumes	116	113	110	100	43	16	20	122	239	111	6	90	408	498
Temp. Winter Grass	58	56	103	98	42	20	5	35	120	165	52	58	319	377
Per. Winter Grass	893	579	678	559	290	172	26	343	1,100	1,214	488	484	2,687	3,171
Summer Grass	1,662	1,431	2,186	2,076	873	280	185	1,097	3,080	3,114	1,032	1,299	7,209	8,508
Coastal Bermuda	346	386	681	742	330	100	97	506	992	799	191	463	2,122	2,585
Fruits and Nuts	67	49	76	104	140	175	14	84	209	231	73	45	566	611
Truck Crops	50	44	75	134	110	92	17	91	229	151	17	158	347	505
Tomatoes-Peppers	8	16	30	44	48	25	2	23	81	55	10	39	132	171
Gardens	595	600	1,013	1,324	1,448	2,847	165	1,038	2,931	2,893	800	1,015	6,812	7,827
Lawns	535	358	477	591	658	1,118	120	655	1,574	1,197	191	301	3,436	3,737
Shrubs	121	81	118	154	220	677	34	195	510	448	184	60	1,311	1,371
Total	7,566	8,009	14,491	15,423	7,792	6,222	1,151	8,308	24,402	20,857	4,785	9,612	49,891	59,503
Percent	12.7	13.5	24.4	25.9	13.1	10.5	1.9	14.0	41.0	35.1	8.0	16.2	83.8	
Total Field Crops	6,190	6,861	12,702	13,072	5,168	1,288	799	6,222	18,868	15,882	3,510	7,994	37,287	45,281
Percent	13.7	15.2	28.1	28.9	11.4	2.8	1.8	13.7	41.7	35.1	7.8	17.7	82.3	100.0
Total Hort. Crops	1,376	1,148	1,789	2,351	2,624	4,934	352	2,086	5,534	4,975	1,275	1,618	12,604	14,222
Percent	9.7	8.1	12.6	16.5	18.5	34.7	2.5	14.7	38.9	35.0	9.0	11.4	88.6	100.0

TABLE 8. SOIL pH DISTRIBUTION OF SAMPLES FROM THE FIVE SOIL GROUPS

Soil group	Below 4.5	4.5-4.9	5.0-5.4	5.5-5.7	5.8-5.9	6.0-6.4	6.5-6.9	7.0-7.4	Above 7.4	Total	Percent
Code Name											
1 Sandy soils of Coastal Plain	75	1,150	6,879	6,626	3,735	5,634	949	158	52	25,258	42.4
Percent	0.3	4.6	27.2	26.2	14.8	22.3	3.8	0.6	0.2	100.0	
2 Loams and Light clays	128	1,345	5,749	4,481	2,685	4,381	2,136	703	229	22,937	38.5
Percent	0.6	5.9	25.1	19.5	11.7	23.9	9.3	3.1	1.0	100.0	
3 Clay soils of Black Belt	3	26	85	82	55	221	282	371	738	1,873	3.1
Percent	0.2	1.4	4.5	4.4	2.9	11.8	15.1	19.8	39.9	100.0	
4 Sandy loams of North Ala.	69	627	2,241	1,073	525	1,026	309	84	8	5,962	10.0
Percent	1.2	10.5	37.6	18.0	8.8	17.2	5.2	1.4	0.1	100.0	
5 Red clay soils Limestone Valley	10	170	884	642	356	857	361	156	37	3,473	5.8
Percent	0.3	4.9	25.5	18.5	10.3	24.7	10.4	4.5	1.1	100.0	
Total	285	3,318	15,838	12,904	7,356	13,219	4,037	1,472	1,074	59,503	100.0
Percent	0.5	5.6	26.6	21.7	12.4	22.2	6.8	2.5	1.8	100.0	

Distribution among Crops (Table 9)

Crops vary in the pH level required for optimum growth. Alfalfa, most clovers, and tomatoes receive a lime recommendation if the pH is below 6.0. Corn, cotton, soybeans, peanuts, and most other crops should be grown at pH 5.8 or above. A few crops such as bermudagrass, bahia, and most lawn grasses grow well at pH 5.6 or above. Lime is not recommended for potatoes, azaleas, or tobacco unless the pH is below 5.0. Table 9 shows the number of samples in 17 crop classifications by soil pH classes.

Some important changes in numbers of samples submitted for the different crops occurred in the 2-year period since 1973. The percentage of samples for corn increased from 5 percent in 1973 to 16 percent in 1975. Approximately one-half of this shift had occurred in 1974, with the other half occurring by 1975. Fourteen percent of the 1975 samples were for summer grass pasture including bahia, bermuda, dallis, and temporary summer grasses,

compared to 16 percent in 1973. The next most predominant field crop was soybeans at 10 percent in 1975, compared to 7.5 percent in 1973. Samples from home gardens were 13 percent of the total in 1975, and 8.0 percent in 1973.

The number of soybean samples received in 1975 is more than double the number received in 1973. Soybeans continue to increase in importance as a crop in Alabama. In 1968, the number of samples for soybeans was so low that it seemed that little consideration was being given to direct fertilization of soybeans. During the 7 years since, soybeans have moved to the second position in the ranking of crops for which recommendations are requested.

Of the 1975 corn samples, 63 percent were below pH 5.8, most of which needed lime. Thirty-three percent of the summer grass pasture samples were below pH 5.5 and needed lime. For the soybean samples, 53 percent were below 5.8. Fifty percent of the garden samples required lime.

TABLE 9. SOIL pH DISTRIBUTION OF SAMPLES FOR DIFFERENT CROPS

Crop	Acidity (pH)									Total	Percent
	Below 4.5	4.5-4.9	5.0-5.4	5.5-5.7	5.8-5.9	6.0-6.4	6.5-6.9	7.0-7.4	Above 7.4		
Corn	35	492	2,958	2,343	1,250	1,816	300	50	30	9,274	15.6
Cotton	17	211	1,226	989	609	1,370	495	106	12	5,035	8.5
Peanuts	0	133	1,254	1,473	904	1,317	114	6	0	5,201	8.7
Soybeans	13	224	1,644	1,369	782	1,313	385	165	195	6,090	10.2
Clover-Winter Grass	13	251	1,034	727	455	827	325	92	64	3,788	6.4
Clover-Summer Grass	0	24	129	145	79	209	71	24	73	754	1.3
Legumes	1	39	163	91	49	106	27	7	15	498	0.8
Temp. Winter Grass	1	19	116	72	44	81	19	8	17	377	0.6
Perm. Winter Grass	7	183	878	579	370	692	243	117	102	3,171	5.3
Summer Grass	44	507	2,295	2,036	1,074	1,777	435	143	197	8,508	14.3
Coastal Bermuda	23	226	806	595	306	499	109	16	5	2,585	4.3
Fruits and Nuts	5	19	132	137	79	171	33	23	12	611	1.0
Truck Crops	6	53	183	113	52	63	26	4	5	505	0.8
Tomatoes-Peppers	0	13	42	38	23	40	10	4	1	171	0.3
Gardens	64	584	1,890	1,387	754	1,692	833	424	199	7,827	13.2
Lawns	41	264	848	641	404	892	395	164	88	3,737	6.3
Shrubs	15	76	240	169	122	354	217	119	59	1,371	2.3
Total	285	3,318	15,838	12,904	7,356	13,219	4,037	1,472	1,074	59,503	100.0
Percent	0.5	5.6	26.6	21.7	12.4	22.2	6.8	2.5	1.8	100.0	

FERTILIZER GRADES RECOMMENDED FOR THE DIFFERENT SOIL GROUPS

In 1975, the soil testing laboratory reduced the number of P₂O₅ to K₂O fertilizer ratios recommended to 1-1, 2-1, and 1-2. Since P or K are no longer recommended at *High* levels, many samples get recommendations of P alone or K alone with the amount of N needed for the crop to be grown. The grades sold in Alabama in recent years have

been primarily in the 1 to 1 ratio.

The ratios recommended for the different soil groups can be determined from the data in Table 10. The percentages needing the different ratios and those sold in Alabama from October 1974 through August 1975 are shown in Table 11. Only 27 percent of samples needing P or K needed a 1-1 ratio while 83 percent of the PK fertilizer sold were grades of this ratio. There is a need for more 2-1 grades and less of the 1-2 or 2-3 grades than

TABLE 10. PK RATING COMBINATIONS BY SOIL GROUPS

P-K Ratings	Soil group					Total	Percent	Rating	P Totals	K Totals
	1	2	3	4	5					
VL- VL	215	240	34	40	9	538	0.90			
L	696	1,195	148	296	107	2,442	4.10			
M	792	1,899	178	281	114	3,264	5.49			
H	261	663	151	51	25	1,151	1.93			
VH	39	85	43	3	1	171	0.29	VL- %	7,566 12.7	1,151 1.9
L- VL	118	88	5	19	2	232	0.39			
L	678	678	80	191	119	1,746	2.93			
M	1,375	1,637	134	424	197	3,767	6.33			
H	780	848	177	113	52	1,970	3.31			
VH	90	152	40	7	5	294	0.49	L- %	8,009 13.5	8,308 14.0
M- VL	135	47	2	15	3	202	0.34			
L	1,104	531	51	198	104	1,988	3.34			
M	3,040	2,316	91	854	435	6,736	11.32			
H	2,521	1,669	170	327	165	4,852	8.15			
VH	400	211	72	18	12	713	1.20	M- %	14,491 24.4	24,402 41.0
H- VL	73	38	9	4	4	128	0.22			
L	845	320	33	109	55	1,362	2.29			
M	3,136	1,823	48	826	533	6,366	10.70			
H	3,311	1,859	106	598	368	6,242	10.49			
VH	808	355	68	62	32	1,325	2.23	H- %	15,423 25.9	20,857 35.1
VH- VL	19	15	2	1	1	38	0.06			
L	266	162	23	46	7	504	0.85			
M	1,037	950	26	420	208	2,641	4.44			
H	1,485	1,384	42	465	336	3,712	6.24			
VH	443	305	34	75	40	897	1.51	VH- %	7,792 13.1	4,785 8.0
EH- VL	5	7	0	1	0	13	0.02			
L	100	143	5	12	6	266	0.45			
M	507	848	20	135	118	1,628	2.74			
H	666	1,686	35	241	302	2,930	4.92			
VH	313	783	46	130	113	1,385	2.33	EH- %	6,222 10.5	
Total	25,258	22,937	1,873	5,962	3,473	59,503	100.00			
Percent	42.45	38.55	3.15	10.02	5.84	100.00				

TABLE 11. PERCENTAGE OF SAMPLES NEEDING VARIOUS P₂O₅ TO K₂O RATIOS FOR THE FIVE SOIL GROUPS, AND RATIOS SOLD IN ALABAMA, OCT. 1974 THROUGH AUGUST 1975

P-K ratings	P ₂ O ₅ to K ₂ O ratio needed	Soil group					Total	Of those needing fertilizer	Fertilizer sales
		1	2	3	4	5			
L-L, M-M	1-1	19	20	19	23	19	20	27	83
L-M	2-1	8	15	17	12	9	12	16	1
M-L	1-2	5	3	3	4	3	4	5	13*
L-H, M-H	1-0	16	16	35	9	7	15	21	1
H-L, H-M	0-1	24	19	9	26	27	22	30	2
H-H	0-0	28	28	18	26	34	28	---	---

* Includes 2-3 ratio.

TABLE 12. SAMPLES RATED BY P AND K FOR EACH CROP

P-K	Corn	Cotton	Peanuts	Soybeans	Clover-grass	Legumes	Small grain winter grass	Coastal bermuda	Fruits truck crops gardens	Lawns shrubs flowers grnhouse	Total	Percent
VL- VL	5	7	16	53	217	5	18	24	94	99	538	0.9
L	111	46	85	291	1,003	42	192	93	320	259	2,442	4.1
M	298	60	74	308	1,343	55	461	161	252	252	3,264	5.5
H	104	8	22	68	548	14	238	60	49	40	1,151	1.9
VH	7	1	2	13	87	0	42	8	5	6	171	0.3
L- VL	10	2	26	22	82	8	5	30	30	17	232	0.4
L	133	58	192	343	468	32	83	97	224	116	1,746	2.9
M	665	249	312	499	1,002	53	254	159	347	227	3,767	6.3
H	456	67	132	196	612	19	235	81	100	72	1,907	3.3
VH	55	0	8	13	125	1	58	19	8	7	294	0.5
M- VL	11	4	39	14	58	4	3	24	32	13	202	0.3
L	193	98	353	319	440	28	54	148	235	120	1,988	3.3
M	1,288	759	946	993	1,232	52	268	272	627	299	6,736	11.3
H	1,394	341	548	419	1,137	26	348	209	278	152	4,852	8.2
VH	229	9	50	34	222	0	108	28	22	11	713	1.2
H- VL	4	3	21	6	30	3	3	13	32	13	128	0.2
L	120	71	213	184	278	16	38	120	205	117	1,362	2.3
M	1,034	1,004	870	872	947	52	165	280	786	356	6,366	10.7
H	1,590	815	737	561	1,163	26	326	262	530	232	6,242	10.5
VH	470	37	92	64	387	3	125	67	53	27	1,325	2.2
VH- VL	0	1	4	1	11	0	1	5	8	7	38	0.1
L	21	18	26	34	81	3	10	41	146	124	504	0.8
M	219	472	151	275	321	18	60	99	661	365	2,641	4.4
H	524	690	197	286	551	21	165	151	801	326	3,712	6.2
VH	192	41	60	43	244	1	96	34	130	56	897	1.5
EH- VL	0	0	0	0	4	0	1	1	2	5	13	0.0
L	4	3	4	5	21	1	1	7	106	114	266	0.4
M	27	42	9	55	91	9	12	21	777	585	1,628	2.7
H	62	107	8	77	173	5	67	36	1,572	823	2,930	4.9
VH	48	22	4	42	172	1	111	35	682	268	1,385	2.3
Total	9,274	5,035	5,201	6,090	13,050	498	3,548	2,585	9,114	5,108	59,503	
Percent	15.6	8.5	8.7	10.2	21.9	0.8	6.0	4.3	15.3	8.6	100.0	

are being sold. The greatest need for change in fertilizers sold is in the P alone or K alone materials throughout the State.

The soil areas are quite uniform in the ratios needed. The clayey soils of the Black Belt in Group 3 need more P and less K than the other areas. The soils of Sand Mountain and the Tennessee Valley need less straight P than the other areas but much more than is being sold. Of all samples received, 28 percent were *High* in both P and K and would not be expected to respond to either of these elements.

FERTILIZER GRADES RECOMMENDED FOR THE DIFFERENT CROPS

The numbers of samples in the PK rating combinations for the various crops are presented in Table 12. Over 40 percent of all samples were in the M-M, M-H, H-M, and H-H categories. These data have been summarized in Table 13 to indicate the grades of fertilizer needed

for different crops. Of all field and forage crop samples needing P or K, 28 percent needed 1-1 fertilizers, 17 percent needed 2-1, and only 5 percent needed low P-high K grades. About one-half of these samples needed only P or only K with the number being equally divided between the two elements. About one-third of all samples for cotton and for corn contained adequate P and K for maximum production. Peanuts showed a need for more 1-2 grades than the other crops, while the forage crop samples needed more 2-1 fertilizers than did the row crops.

Since maintenance applications of low rates of P and K are still recommended for most horticultural crops at *High* soil test levels, 53 percent of these samples that needed either P or K needed 1-1 grades. The buildup of P in most of these samples led to the remainder needing Low P-High K grades or materials containing only K.

These data indicate that there is a great need for changes in the grades of fertilizer offered to growers in Alabama. The percentage of fertilizer mixed in the 1-1 ratio should be drastically reduced. Straight P or K materials should

TABLE 13. PERCENTAGE OF SAMPLES NEEDING VARIOUS P₂O₅ TO K₂O RATIOS FOR THE DIFFERENT CROPS

P-K ratings	P ₂ O ₅ to K ₂ O ratio needed	Corn	Cotton	Peanuts	Soybeans	Forage	Field crops		Horticultural crops	
							45,281 samples	34,290 needing P or K	14,222 samples	9,484 needing P or K
L-L, M-M	1-1	17	17	24	28	21	21	28	35*	53
L-M	2-1	10	6	7	13	18	13	17	0	0
M-L	1-2	2	2	8	5	4	4	5	11	16
L-H, M-H	1-0	24	8	15	12	22	19	25	1	1
H-L, H-M	0-1	15	32	25	24	14	19	25	20	30
H-H	0-0	31	34	21	18	21	24	---	33*	---

* Most horticultural samples rating *High* received a maintenance recommendation while only those rating *Very High* or *Extremely High* did not get a P or K recommendation.

be made available to growers and the percentage of 1-2 grades sold should be reduced in favor of the 2-1 grades that are being sold in very limited quantities. These changes would allow farmers to meet the fertility needs of their crops at much lower costs and would reduce the waste of P or K where it is being applied to crops on soils that will not respond to it. If farmers could buy the grades that soil tests show they need, they should be encouraged to use soil tests to determine what grades and amounts they should apply to maximize profits.

CALCIUM RATINGS OF SAMPLES FOR PEANUTS FROM 13 COUNTIES (TABLE 14)

Calcium levels of samples for peanuts for 1975 are given in Table 14. There is little difference between 1974 and 1975, but there is a significant shift from the distribution in 1972, the last year for which data is available. The samples rated low were 14 percent in 1974 and 13 percent in 1975, compared to 26 percent in 1972. Those rated

medium were 27 percent in 1974, 26 percent in 1975, and 42 percent in 1972. The samples rated high in 1974 were 58 percent of the total, and those rated high in 1975 were 62 percent, compared to 32 percent in 1972. Beginning in 1973, the soil-test Ca levels at which soil were rated *Medium* were lowered from 250 pounds Ca per acre to 175 and ratings for *High* were lowered from 400 to 300. This had the effect of moving some of the samples to the higher ratings. Less gypsum is now recommended on soils of adequate pH. Lime recommendations are the same as previous pH levels, but the increase in plow depth for which lime is recommended from 6 inches to 8 inches has had the effect of increasing the amounts recommended by one-third.

On the 12.5 percent of the samples rated *Low* in Ca in 1975, gypsum was recommended, even where lime was also recommended. Gypsum was recommended on the 25.9 percent of the 1975 samples rated *Medium* in Ca only where the pH was above 5.7 and no lime was needed. These figures compare with 26 percent and 42 percent in 1972.

TABLE 14. CALCIUM—NUMBER AND PERCENT OF PEANUT SAMPLES RATING LOW, MEDIUM AND HIGH FOR 13 COUNTIES—1975

County	Calcium rating						Total	
	Low		Medium		High		Number	Percent
	Number	Percent	Number	Percent	Number	Percent		
Barbour	102	27.3	133	35.6	139	37.2	374	7.2
Bullock	10	25.6	16	41.0	13	33.3	39	0.8
Butler	4	16.7	7	29.2	13	54.2	24	0.5
Coffee	92	12.5	171	23.2	475	64.4	738	14.3
Conecuh	4	13.8	4	13.8	21	72.4	29	0.6
Covington	36	13.4	69	25.7	163	60.8	268	5.2
Crenshaw	26	9.9	94	35.9	142	54.2	262	5.1
Dale	65	16.4	125	31.5	207	52.1	397	7.7
Geneva	55	10.1	133	24.5	355	65.4	543	10.5
Henry	103	10.9	225	23.8	618	65.3	946	18.3
Houston	88	8.3	232	21.8	743	69.9	1,063	20.6
Pike	58	12.9	117	25.9	276	61.2	451	8.7
Russell	2	8.0	8	32.0	15	60.0	25	0.5
Total 1975	645	12.5	1,334	25.9	3,180	61.6	5,159	100.0
Total 1974	483	14.2	935	27.4	1,989	58.4	3,407	100.0

