1918

1918

SOIL MOISTURE SURVEY

of some representative Missouri soil types

April 1960 ARS-41-34

Agricultural Research Service

UNITED STATES DEPARTMENT OF AGRICULTURE

CONTENTS

This report has been prepared by the Agricultural Research Service, and covers a part of the cooperative survey and investigations of the Lower Mississippi River and tributaries made by the Agricultural Research Service, Forest Service, and Soil Conservation Service, U.S. Department of Agriculture, under Section 6, Public Law 566, 83d Congress, in cooperation with the Mississippi River Commission.

SOIL MOISTURE SURVEY OF SOME REPRESENTATIVE MISSOURI SOIL TYPES[1]

E. M. Kroth, V. C. Jamison, and H. E. Grogger[2]

INTRODUCTION

Knowledge of the amount of water retained by a soil that is usable for growing plants is of value to farmers, designers of irrigation systems, and a wide range of researchers interested in plant-soil relationships. The concept of available water capacity was developed in connection with the irrigated soils of western United States, and the method for its determination was worked out by research personnel in that area. As irrigation increased in the humid sections of the United States, interest in the determination of available water-holding capacity of soils capable of being irrigated during periods of drought has developed.

SOIL MOISTURE SURVEY

An available water-holding capacity survey was begun in 1955 for the major soil types of Missouri. Results of this survey to date are given in this report. The locations of the soils studied are shown in figure 1, and these soils, their classification, and list of related soils are given in table 1. Soil-type names and classifications indicated in this report should be considered tentative as recent correlation work in soil nomenclature is lacking in the areas where many of the soil samples were taken.

DEFINITIONS AND CONCEPTS

Available Water Capacity

Available water-holding capacity is defined as the amount of water held by a soil between field capacity and the wilting point. Field capacity is described as the amount of water in a soil after it has been saturated and excess water allowed to drain until further drainage is negligible. Water at wilting point is the amount remaining in the soil when plants growing on it wilt permanently. These values are first obtained in the laboratory as percent of water per unit weight of oven-dry soil. The forces that hold water in the soil pores at field capacity and at the wilting point are the attractive forces of soil particles

[1] Joint contribution of the Missouri Agricultural Experiment Station, and the Agricultural Research Service and the Soil Conservation Service of the United States Department of Agriculture. Missouri Journal Series No. 2005.

[2] Assistant Professor, Department of Soils, University of Missouri (formerly Soil Scientist, ARS); Soil Scientist, ARS; and State Soil Scientist, Soil Conservation Service, USDA, respectively. Located at Missouri Agricultural Experiment Station, Columbia.

Acknowledgment is given to G. E. Kintner, J. P. Andrews, R. M. Hamby, J. B. Fulton, M. G. Wilbur, and B. L. Brown, Soil Scientists of the Soil Conservation Service, USDA, for locating sampling sites and providing profile descriptions; and to C. C. Clubb and R. S. Graham, county agents of the Missouri Agricultural Extension Service, for locating sampling sites in Greene and Lawrence Counties.

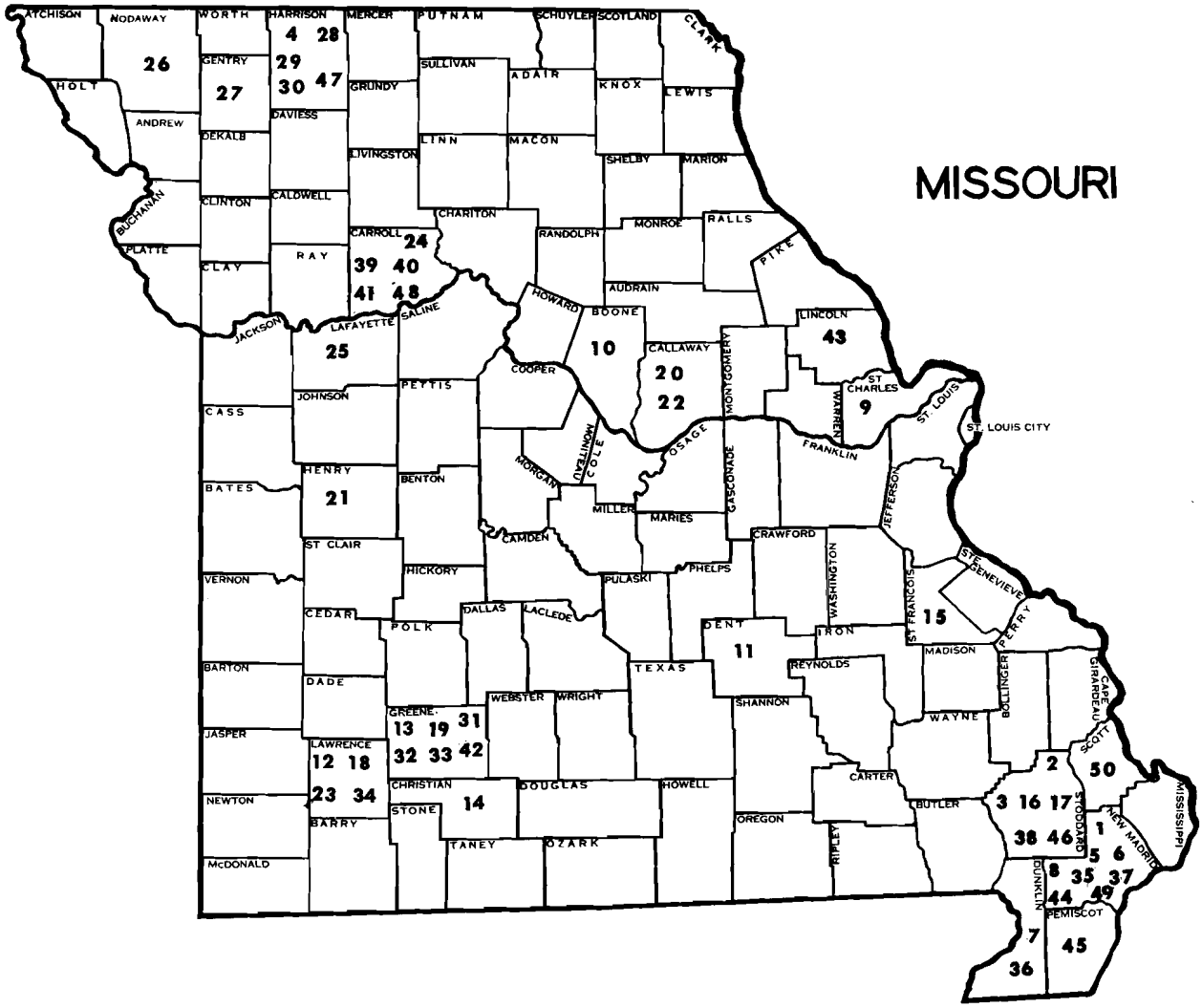

Figure 1.--Sample sites, located by county, of 50 soil types in Missouri.

for water and the surface tension of the water. Equipment has been devised to measure the force with which the water is held by the soil. This force, "suction," or "tension," is equal to (in the opposite direction from) the differential air pressure across a wet membrane in the equipment used to remove the water from the soil at each selected suction point. Laboratory and field experience has shown that for practical purposes most soils of Missouri at the field-capacity condition hold water with an approximate suction of 1/3 atmosphere and at the wilting point with a suction of about 15 atmospheres. By saturating samples and determining the amount of water they retain after being put under 1/3 and 15 atmospheres air pressure, it is possible to determine the percent of water held by a given weight of soil at these points.

Since the pores in every soil vary in size it seemed likely that the sizes of pores holding water at and between the 1/3- and 15-atmosphere points will be different in different soils. To find these differences and get information on pore space relationships, the amounts of water held at 0.1, 0.33, 1.0, 3.0, and 15.0 atmospheres suction were determined on all soils studied. When these values were plotted against suction, "desorption" curves were produced which showed the space differences of pores between various soils.

TABLE 1.--Soils studied in Missouri and similar soils to which moisture data may be applicable, listed by soil classes

Soil No.	Soil type	Missouri field No.	Related soils
	Gray-Brown Podzolic		
1	Freeland loamy fine sand	643	Lintonia
2	Richland silt loam	202	Captina - Lawrence
3	Olivier silt loam	252	Taft
4	Lindley loam	21	-------
5	Dexter silt loam	193	Lintonia
6	Dexter loam	193	Lintonia
7	Dexter sandy loam	64	Lintonia
8	Dubbs silt loam	191	-------
9	Menfro silt loam	19	Fayette, Knox, Memphis, Loring
10	Weldon silt loam	25	Weller, Hatton
	Red-Yellow Podzolic		
11	Pearman-like silt loam	203	-------
12	Baxter silt loam	2	Elk
13	Baxter cherty silt loam	2	Riverton
14	Nixa-like silt loam	8	-------
15	Hagerstown silt loam	1	-------
	Planosol		
16	Calhoun silt loam	102	Robertsville, Connor
17	Calhoun silt loam	102	Robertsville, Connor
18	Guthrie silt loam	10	Lebanon
19	Guthrie silt loam	10	Lebanon
20	Putnam silt loam	15	Cherokee
	Planosol - Brunizem Intergrade		
21	Oswego silt loam	241	Parsons
22	Mexico silt loam	24	Parsons
23	Gerald silt loam	24	Parsons
	Brunizem		
24	Unnamed silt loam	116	-------
25	Marshall silt loam	14	Tama, Brown-phase Marshall
26	Marshall silt loam	14	Brown-phase Marshall
27	Sharpsburg silt loam	22	-------
28	Shelby loam	16	Gara
29	Shelby loam (virgin)	16	-------
	Brunizem - Humic-Gley Intergrade		
30	Grundy silt loam	11	Summit, Woodson
	Brunizem - Reddish Prairie Intergrade		
31	Bolivar sandy loam	23	Collinsville

TABLE 1.--Soils studied in Missouri and similar soils to which moisture data may be applicable, listed by soil classes--Continued

Soil No.	Soil type	Missouri field No.	Related soils
		Reddish Prairie	
32	Newtonia silt loam	1	Cumberland
33	Newtonia silt loam	1	Cumberland
		Lithosol	
34	Eldorado silt loam	30	Eldon, Craig
		Alluvial	
35	Beulah loamy sand	643	Clark, Crevasse
36	Beulah loamy sand	643	Clark, Crevasse
37	Commerce silt loam	672	-------
38	Falaya silt loam	672	Westerville, Lindside, Holly
39	Sarpy fine sandy loam	64	Haynie
40	Sarpy loamy sand	61	-------
41	Onawa silty clay	57	Humeston
42	Huntington silt loam	66	Vicksburg
43	Sharon silt loam	66	Genesee, McPaul
		Low Humic-Gley	
44	Alligator-like clay loam	79	-------
45	Sharkey-like clay	59	Crowder
46	Waverly silt loam	762	Melvin
		Humic-Gley	
47	Wabash silt loam	55	-------
48	Wabash clay	58	Humeston
		Gray-Brown Podzolic - Alluvial Intergrade	
49	Forestdale fine sandy loam	253	-------
50	Forestdale-like loamy sand	253	-------

Bulk Density

Available water capacity is best expressed in percents by volume instead of by weight. To do this the dry weight of a given volume of soil, or its "bulk density," is needed. In practice this is expressed in grams per cubic centimeter of soil as it is found in the field. To avoid errors due to soil shrinkage upon drying, bulk densities should be measured at or near the field-capacity moisture condition.

Inches of Water Per Inch of Soil

Convenience in calculating the total available water capacity of a given soil is increased by having available-water capacity expressed as fraction of an inch of water per inch of soil depth. Since the density of water is for practical purposes taken as unity, the formula for expressing available water is as follows:

$$\frac{(\text{pw .33 atm} - \text{Pw 15 atm}) \times \text{Bulk Density}}{100} = \text{inch water/inch soil}$$

EXPERIMENTAL MEASUREMENTS

Moisture

Samples from the several horizons were taken from the side of a pit dug to profile depth. Samples were taken from the centers of each horizon. Bulk-density samples were taken in 16-oz. tin cans, and cores for the suction studies were taken in 1-oz. cans, cans of both size being forced into the soil with Lutz-type samplers. All bulk density values and the percentages of moisture returned at 0.33 atm. and 15 atm. are averages of five samples; the 0.10-, 1.0-, and 3.0-atm. values are averages of four, three, and two samples, respectively.

Soils which contained any appreciable quantity of stones were sampled by a "post-hole" technique. All soil and stones were removed from given layers by hand and stored in sacks. Later the material was weighed and enough soil separated from the stones and passed through a 2-mm. sieve on which to make bulk-density and suction measurements. Stones were then washed free of soil and dried and weighed. The total quantity of soil was then determined by difference. The volume of the "posthole" was found by filling with a known quantity of sand. It was discussed that random stones in some samples also had holding capacity for available water. These quantities are incorporated in the inches water per inch of soil values given for the stony soils.

Occasionally soil horizons as described by the soil scientists did not coincide with a sampling layer. For examples, sampling technique did not permit the sampling of a horizon less than 4 inches in thickness. In other cases several contiguous horizons were similar except for color differences. Such horizons were often sampled as one layer. The results of tests made under these conditions are given for the midpoint of total actual tickness sampled. Where no tests were made but the horizons have been described, the most acceptable available water-holding capacity estimates for them are given and can be used in calculating the total available water-holding capacities for the profiles.

Mechanical Analyses

The available water capacity of a soil is related to its texture. In general, soils high in silt have a large, those high in clay a medium, and those high in sand a small available water capacity. Mechanical analyses were determined by the hydrometer method on samples from the same horizons for which the suction tests were made.

Chemical Analyses

Organic matter determinations were made[3] on samples taken from all horizons.

The results of all experimental measurements are given in tables appended at the end of this written report. The moisture values given should be considered only as estimates owing to the well known variability of soils. To estimate the amount of available water for a given profile, calculate the amount of available water for each horizon (thickness x inch per inch) and find the total for all the horizons. The same values can be used for the related soils listed in Table 1 to estimate their available water-holding capacity.

For each individual location it is advisable to determine the thickness of each horizon and use the several values in making the total.

[3]Soil Testing Laboratory, University of Missouri.

APPENDIX

Soil Characteristics

and

Soil Moisture Desorption Data

Soil Type: Freeland loamy fine sand No. 643
Classification: Gray-Brown Podzolic
Area: New Madrid County (Key to map: 1)

Parent Material: Mixed alluvium
Relief: Nearly level
Drainage: Moderately well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-8	Dark gray brown (10YR 4/2) loamy fine sand; very fine weak granular structure.	12.9	9.0	6.9	5.8	4.7	0.071
A_3	8-14	Yellowish brown (10YR 5/4) and brown (10YR 5/3) loamy fine sand; dark yellowish brown (10YR 4/4); mottling common faint and fine; very fine weak subangular blocky structure; nonsticky when wet.	17.0	11.1	8.4	6.3	3.9	.109
B_1	14-34	Yellowish brown (10YR 5/4) very fine sandy loam; mottling prominent and coarse; light gray (10YR 7/2) and pale brown (10YR 6/3); also a few very pale brown (10YR 7/3); very fine weak subangular blocky structure; nonsticky when wet.	17.6	12.2	9.5	7.3	5.3	.110
B_2	34-40	Gray (10YR 6/1) or light brownish gray (10YR 6/2); very fine sandy loam, many prominent medium mottlings of yellowish brown (10YR 5/8); fine weak subangular blocky structure; slightly sticky when wet.	18.0	15.0	11.8	10.6	7.6	.119

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_p	0-8	1.65	1.3	76	8	10	6
A_3	8-14	1.52	1.4	64	15	14	7
B_1	14-34	1.59	.6	63	15	15	7
B_2	34-40	1.61	.5	71	11	8	10

Soil Type: Richland silt loam No. 202
Classification: Gray-Brown Podzolic
Area: Stoddard County (Key to map: 2)

Parent Material: Loess and alluvium
Relief: Gently rolling
Drainage: Moderately well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-8	Dark brown (10YR 4/3) silt loam; very fine weak subangular blocky structure, often appearing granular.	23.9	19.4	13.7	8.9	5.9	0.198
B_{11}	8-14	Yellowish brown (10YR 5/4) silt loam; moderately fine subangular structure; when dry in place has appearance of being massive; faint mottling present.	24.8	21.9	16.3	13.2	8.8	.187
B_{12}	14-22	Yellowish brown (10YR 5/4) silt loam; moderate subangular blocky structure; mottling common, medium size; distinct in contrast - very dark gray brown (10YR 3/2).	27.4	25.6	20.7	18.3	13.5	.179
B_2	22-30	Dark brown (10YR 4/3) silty clay loam; strong coarse subangular blocky structure; mottling common, medium size distinct; very dark gray brown (10YR 3/2); light gray (10YR 7/1) and yellowish brown (10YR 5/6).	28.0	26.5	22.4	19.0	15.9	.159

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_p	0-8	1.47	1.4	15	31	44	10
B_{11}	8-14	1.43	.6	10	25	46	19
B_{12}	14-22	1.48	.5	11	24	45	20
B_2	22-30	1.50	.4	12	21	41	26

Soil Type: Olivier silt loam No. 252
Classification: Gray-Brown Podzolic
Area: Stoddard County (Key to map: 3)

Parent Material: Loess alluvium
Relief: Nearly level
Drainage: Poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-6	Dark gray brown (10YR 4/2) friable silt loam; some low contrast mottling of light olive gray (5Y 6/2) weak very fine granular structure; slightly sticky when wet.	26.6	22.9	16.0	10.7	7.2	0.228
A_3	6-13	Yellowish brown (10YR 5/4) silt loam; weak subangular blocky structure; mottling common; dark brown (7.5YR 3/2) and yellowish red (5YR 5/8); slightly sticky when moist.	28.2	25.3	18.9	13.2	9.5	.229
B_{11}	13-17	Brown (10YR 5/3) to yellowish brown (10YR 5/4) light silty clay loam; fine moderate subangular blocky structure; mottling common very dark brown (10YR 2/2) light yellowish brown (10YR 6/4) and light gray (2.5Y 7/2); slightly sticky when wet; firm when moist.	-	-	-	-	-	.203
B_{12}	17-20	Light gray (5Y 7/2) silty clay loam; fine moderate subangular blocky structure; mottling common; coarse; yellowish red (5YR 4/6); dark reddish brown (5YR 3/2) and black (5YR 2/1); slightly sticky when wet; firm when moist.	26.1	25.0	20.7	16.0	11.2	.203
B_2	20-36	Brown (10YR 5/3) to gray brown (10YR 5/2) silty clay loam; medium subangular blocky structure; coarse mottling common; dark yellowish brown (10YR 4/4); very dark gray brown (10YR 3/2) and brownish yellow (10YR 6/8); layer is dense and compact; sticky when wet; firm when moist.	28.3	29.2	28.0	23.8	22.8	.096

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_p	0-6	1.45	1.3	7	33	50	10
A_3	6-13	1.45	1.0	11	23	52	14
B_{11}	13-17	-	-	-	-	-	-
B_{12}	17-20	1.50	.7	11	23	49	17
B_2	20-36	1.50	.7	7	18	50	25

Soil Type: Lindley loam No. 21
Classification: Gray-Brown Podzolic
Area: Harrison County (Key to map: 4)

Parent Material: Glacial till
Relief: Rolling
Drainage: Moderately well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-6	Dark gray brown (10YR 4/2) loam; crumb to slightly platy structure; pH 5.8.	23.0	18.6	16.4	12.1	7.5	0.143
B_1	6-10	Yellowish brown (10YR 5/4) gritty clay loam; very fine subangular blocky structure; pH 4.9.	15.2	15.1	10.7	7.8	4.9	.163
B_2	10-22	Dark yellowish brown (10YR 4/4) sandy clay; fine subangular blocky structure; pH 5.0.	25.0	23.1	22.8	19.0	17.4	.079
C	22-32	Yellowish brown (10YR 5/4) sandy clay; mottled with gray (10YR 6/1) and light brownish gray (10YR 6/2); plastic when wet, massive structure.	-	-	-	-	-	-

Horizon	Depth	Bulk density	Organic matter	Mechnical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_p	0-6	1.28	2.9	54	12	24	10
B_1	6-10	1.59	1.2	51	14	19	16
B_2	10-22	1.38	1.0	35	7	13	45
C	22-32	-	-	-	-	-	-

Soil Type: Dexter silt loam No. 193
Classification: Gray-Brown Podzolic
Area: New Madrid County (Key to map: 5)

Parent Material: Loess and alluvium
Relief: Gently rolling
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-9	Dark brown (10YR 3/3) silt loam; fine weak crumb structure with a few gray coatings; some faint mottling; friable when moist; slightly sticky when wet.	20.2	18.9	16.6	13.3	8.4	0.164
A_3	9-15	Dark gray brown (10YR 4/2), dark brown (10YR 4/3) very fine sandy loam or silt loam; fine weak crumb structure; friable when moist; slightly sticky when wet.	20.5	17.9	13.9	10.4	7.4	.156
B_1	15-20	Dark yellowish brown (10YR 4/4) heavy silt loam; fine weak crumb structure; friable when moist; slightly sticky when wet.	20.8	18.2	14.0	9.4	6.1	.188
B_{21}	20-24	Dark yellowish brown (10YR 4/4) light silty clay loam; medium moderate subangular blocky structure friable when moist; slightly sticky when wet.	19.8	19.4	15.8	13.0	8.9	.169
B_{22}	24-34	Dark brown (10YR 4/3); dark gray brown (10YR 4/2) sandy clay loam; medium angular blocky structure; friable when moist; sticky when wet.	21.8	21.3	19.9	17.5	14.6	.110
B_{23}	34-48	Dark brown (7.5YR 4/4) or reddish brown (5YR 4/4) sandy clay loam; fine weak subangular structure; friable when moist; sticky when wet.	19.5	18.2	15.0	13.9	10.7	.127

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_1	0-9	1.56	2.0	34	16	34	16
A_3	9-15	1.49	1.3	37	24	25	14
B_1	15-20	1.56	.8	29	26	28	17
B_{21}	20-24	1.61	.8	28	23	26	23
B_{22}	24-34	1.64	.8	51	11	13	25
B_{23}	34-48	-	.6	68	7	6	19

Soil Type: Dexter loam No. 193
Classification: Gray-Brown Podzolic
Area: New Madrid County (Key to map: 6)

Parent Material: Loess and alluvium
Relief: Gently rolling
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-6	Dark gray brown (10YR 4/2) loam; fine weak granular structure.	22.2	13.0	9.1	6.5	4.3	0.135
A_3	6-12	Dark brown (10YR 4/3 - 7.5YR 4/4) loam; structure much same as above.	23.5	15.6	10.3	7.5	4.3	.168
B_{11}	12-17	Dark yellowish brown (10YR 4/4) loam; friable fine granular structure.	-	-	-	-	-	.156
B_{12}	17-29	Yellowish brown (10YR 5/4) fine sandy loam; weak, fine subangular blocky structure; krotovinas present in above horizons.	22.2	16.5	12.0	8.9	6.3	.156
B_{21}	29-32	Dark brown to dark reddish brown (10YR 3/3 - 5YR 3/4) loam; medium moderate blocky structure. Some distinct (10YR 3/2) and few faint (10YR 5/6) mottles.	19.8	16.7	13.9	12.5	9.1	.121
B_{22}	32-42	Brown (10YR 4/3) loam; moderate medium subangular blocky structure; some mottling; faint fine very dark gray brown (10YR 3/2) and yellowish brown (10YR 2/2)	19.8	16.7	13.9	12.5	9.1	.121
B_3	42-48	Dark brown (10YR 4/3) sandy loam; medium, moderate subangular blocky structure; some distinct mottling of very dark brown (10YR 2/2) and gray (10YR 6/1).	21.7	16.6	13.9	11.0	8.6	.133
C or D	48-60	Yellowish brown (10YR 5/4) loamy sand; single grain structure.	-	-	-	-	-	-

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_p	0-6	1.55	2.0	41	29	23	7
A_3	6-12	1.49	1.7	34	28	29	9
B_{11}	12-17	-	-	-	-	-	-
B_{12}	17-29	1.53	1.2	32	28	27	13
B_{21}	29-32	1.60	-	-	-	-	-
B_{22}	32-42	1.60	.9	44	22	17	17
B_3	42-48	1.64	.7	64	14	7	5
C or D	48-60	-	-	-	-	-	-

Soil Type: Dexter sandy loam No. 64
Classification: Gray-Brown Podzolic
Area: Dunklin County (Key to map: 7)

Parent Material: Loess and alluvium
Relief: Gently rolling
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-6	Dark brown (10YR 3/3) sandy loam; very weak crumb structure easily broken into single grain.	7.1	4.8	4.1	3.9	3.0	0.030
B_1	6-21	Dark brown (7.5YR 3/2) sandy loam; very weak sub-angular blocky structure; crumbles easily into single grain.	7.9	6.3	5.6	5.6	4.3	.032
C	21-36	Dark reddish brown (5YR 3/4) loamy sand. Single grain structure.	8.3	6.6	5.6	5.6	4.2	.037
	36-40	Color and texture same as above. Some mottling of black (5YR 2/1) and light yellowish brown (10YR 6/4).	-	-	-	-	-	.037

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_p	0-6	1.68	1.3	89	2	5	4
B_1	6-21	1.51	.8	85	3	6	6
C	21-36	1.55	.6	85	2	7	6
	36-40	-	-	-	-	-	-

Soil Type: Dubbs silt loam no. 191
Classification: Gray-Brown Podzolic
Area: New Madrid County (Key to map: 8)

Parent Material: Loess and alluvium
Relief: Nearly level
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-5	Dark gray brown (10YR 4/2) silt loam; very fine weak granular structure.	23.1	20.3	19.0	16.4	9.7	0.159
A_3	5-11	Dark yellowish brown (10YR 4/3 - 4/4) silt loam. Very fine weak subangular blocky structure. Some mottling of very dark brown (10YR 2/2).	21.8	20.7	18.7	18.6	10.4	.166
B_1	11-17	Dark yellowish brown (10YR 4/4) silt loam. Structure as above layer; organic stains in pores and root passages.	-	-	-	-	-	.173
B_2	17-24	Yellowish brown (10YR 5/4) silt loam; weak fine subangular blocky structure; organic stains also present.	22.6	18.5	13.2	9.6	6.8	.173
D_1	24-48	Light brownish gray to pale brown (10YR 6/2 - 6/3) sandy loam. Single grain structure.	18.6	15.9	14.3	13.6	10.9	.080
D_2	48-55	Dark yellowish brown (10YR 3/4) sandy clay.	-	-	-	-	-	-

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_p	0-5	1.50	2.8	18	16	46	20
A_3	5-11	1.61	2.6	11	28	43	18
B_1	11-17	-	-	-	-	-	-
B_2	17-24	1.51	1.3	18	32	35	15
D_1	24-48	1.60	.6	-	-	-	-
D_2	48-55	-	-	-	-	-	-

Soil Type: Menfro silt loam No. 19
Classification: Gray-Brown Podzolic
Area: St. Charles County (Key to map: 9)

Parent Material: Loess
Relief: Rolling
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-7	Dark yellowish brown (10YR 4/4) very friable silt loam; moderately developed fine granular structure.	27.5	25.2	14.5	8.2	5.2	0.286
A_{21}	7-12	Yellowish brown (10YR 5/4) friable silt loam; weakly developed fine platy and moderately well-developed, medium granular structure.	23.2	22.7	16.3	9.6	6.6	.233
A_{22}	12-18	Yellowish brown (10YR 5/4) friable silt loam; slightly mottled with light yellowish brown; weakly developed medium platy aggregates--crush into weakly developed fine nuciform structure.	-	-	-	-	-	.109
B_1	18-24	Yellowish brown (10YR 5/6) friable heavy silt loam; moderately developed; medium nuciform structure; particles heavily coated with yellowish brown silt loam.	24.5	24.0	22.5	18.7	16.6	.109
B_{21}	24-34	Yellowish brown (10YR 5/6) silty clay loam; well developed coarse blocky structure; few faint brown and yellowish brown stains on aggregates.	25.7	25.7	23.7	21.1	18.7	.109
B_{22}	34-40	Yellowish brown (10YR 5/8) friable to firm silty clay loam; weakly developed coarse blocky structure; faint coatings of moderate brown.	-	-	-	-	19.5	.097
B_3	40-54	Yellowish brown (10YR 5/8) to light yellowish brown (10YR 6/4) friable silty clay loam; weakly developed coarse blocky structure; stains of brownish black to moderate brown.	27.0	26.0	24.5	22.5	19.5	.097
C	54-62	Light yellowish brown (10YR 6/4) friable silt loam. Very coarse weakly developed blocky structurelsome surfaces stained moderate brown and weak brown; structure more massive with depth.	-	-	-	-	-	.097

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_1	0-7	1.41	1.2	7	42	44	7
A_{21}	7-12	1.45	.7	5	41	41	13
A_{22}	12-18	-	-	-	-	-	-
B_1	18-24	1.47	.5	4	31	42	23
B_{21}	24-34	1.53	.5	4	29	44	23
B_{22}	34-40	-	-	-	-	-	-
B_3	40-54	1.49	.3	6	24	48	22
C	54-62	-	-	-	-	-	-

Soil Type: Weldon silt loam no. 25
Classification: Gray-Brown Podzolic
Area: Boone County (Key to map: 10)

Parent Material: Loess
Relief: Gently rolling
Drainage: Poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-9	Dark grayish brown (10YR 4/2) moist, to pale brown (10YR 6/3) dry, very friable silt loam; weakly developed fine granular structure	27.2	22.6	18.5	12.8	8.8	0.183
A_2	9-14	Very pale brown (10YR 7/3) moist, to (10YR 8/3) dry, friable silt loam; weakly developed fine platy structure.	24.6	21.6	16.2	13.3	9.7	.172
B_1	14-22	Yellowish brown (10YR 5/4) hard silty clay loam to silty clay. Well developed, medium subangular blocky structure.	31.0	29.8	27.3	28.4	23.2	.094
B_2	22-30	Yellowish brown (10YR 5/4) slightly hard silty clay; mottled very pale brown; moderately developed medium subangular blocky structure.	28.2	27.5	25.9	25.1	20.6	.103
B_3	30-40	Light brownish gray (10YR 6/2) and dark yellowish brown (10YR 4/4) hard silty clay loam; slightly mottled; weakly developed coarse blocky structure.	-	-	-	-	-	.126
C	40-50	Light grayish brown and dark yellowish brown "heavy" silt loam; some mottling.	25.4	25.4	22.3	20.9	17.2	.126

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_1	0-9	1.33	2.9	4	41	49	6
A_2	9-14	1.45	1.6	3	48	40	9
B_1	14-22	1.42	1.4	2	28	50	20
B_2	22-30	1.50	1.1	1	31	51	17
B_3	30-40	-	-	-	-	-	-
C	40-50	1.54	.9	1	23	61	15

Soil Type: Pearman-like silt loam No. 203
Classification: Red-Yellow Podzolic
Area: Dent County (Key to map: 11)

Parent Material: Sandstone
Relief: Gently rolling
Drainage: Moderately well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	1-4	Light gray (10YR 7/2 dry) to light yellowish brown (10YR 6/4 wet) silt loam; soft fine granular structure; scattered fine chert; pH 4.6.	25.9	22.6	16.2	10.7	7.5	0.218
B_1	4-7	Strong brown (7.5YR 5/8 wet) light silty clay loam; fine weak subangular blocky structure; scattered chert; pH 4.6.	-	-	-	-	-	.123
B_2	7-12	Strong brown (7.5YR 5/6 wet) silty clay loam; firm fine subangular blocky structure; pH 4.8.	24.9	21.7	19.0	14.6	13.1	.123
B_3	12-16	Strong brown (7.5YR 5/8 wet) light silty clay loam; firm fine subangular blocky structure; scattered fine chert.	28.0	26.3	25.3	23.1	20.0	.095
B_m	16-22	Fragipan horizon white (10YR 8/2 dry) to very pale brown (10YR 7/3 wet) loam to silt loam; numerous fine chert.	-	-	-	-	-	.095
C	22-36	Gray (10YR 6/1) clay with red (2.5YR 4/6) mottling; firm, medium subangular blocky structure; pH 5.2.	-	-	-	-	-	.095

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_1	1-4	1.45	1.9	11	18	55	16
B_1	4-7	-	-	-	-	-	-
B_2	7-12	1.43	.9	6	16	45	33
B_3	12-16	1.50	1.0	16	10	34	40
B_m	16-22	-	-	-	-	-	-
C	22-36	-	-	-	-	-	-

Soil Type: Baxter silt loam No. 2
Classification: Red-Yellow Podzolic
Area: Lawrence County (Key to map: 12)

Parent Material: Limestone residuum
Relief: Rolling
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_0	0-2	Dark brown (7.5YR 3/2) silt loam; moderate fine crumb structure; some small pebbles; pH 5.0.	-	-	-	-	-	0.187
A_1	2-6	Dark gray brown (10YR 4/2) very friable silt loam; moderate fine granular structure; some small pebbles.	23.3	20.3	16.0	10.1	6.6	.187
AB	6-12	Yellowish red (5YR 4/6) silt loam or coarse heavy silt loam; moderate fine granular structure; pH 4.5	22.3	19.8	16.8	12.9	8.7	.159
B_1	12-22	Yellowish red (5YR 4/6) silty clay loam; moderate fine granular structure.	23.7	21.5	19.3	14.4	11.0	.155
B_2	22-32[1]	Yellowish red (5YR 4/6) to red (2.5YR 4/6) silty clay loam; weak fine subangular blocky structure; pH 4.0; considerable chert.	21.1	21.8	19.9	18.3	15.0	.156
B_3	32-38[1]	Red (2.5YR 4/8) silty clay loam; iron and magnesium concretions and chert present.	19.7	20.8	19.4	18.4	15.2	.077

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_0	0-2	-	-	-	-	-	-
A_1	2-6	1.36	1.6	12	28	45	15
AB	6-12	1.44	.9	8	29	39	24
B_1	12-22	1.47	.4	7	29	35	29
B_2	22-32	1.70	.3	14	21	29	36
B_3	32-38	1.56	.1	21	18	25	36

[1] "Posthole" technique used in obtaining samples.

Soil Type: Baxter cherty silt loam No. 2
Classification: Red-Yellow Podzolic
Area: Greene County (Key to map: 13)

Parent Material: Limestone residuum
Relief: Rolling
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-5	Dark brown (7.5YR 3/2) silt loam; strong fine crumb structure; pH 7.1.	-	-	-	-	-	0.171
A_2	5-8[1]	Color same as above; heavy silt loam; strong fine platy structure; 0-8" 25% chert fragments ranging from gravel to 8" diameter.	30.6	23.7	17.9	11.7	7.2	.171
B_{11}	8-11[1]	Brown (7.5YR 5/4) silty loam; fine angular blocky structure; pH 6.6.	-	-	-	-	-	.171
B_{12}	11-23[1]	Reddish brown (5YR 5/3) to dark reddish brown (5YR 3/4 moist) silt loam; 90% chert.	27.9	20.8	15.8	11.6	7.7	.174
B_2	23-28[1]	Dark red (2.5YR 3/6) silty clay loam, occurring as thin films on chert faces and between chert particles; 90% chert.	25.9	23.0	21.0	20.4	18.3	.074

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_1	0-5	-	-	-	-	-	-
A_2	5-8	1.05	2.1	6	30	50	14
B_{11}	8-11	-	-	-	-	-	-
B_{12}	11-23	1.09	1.4	13	23	44	20
B_2	23-28	1.52	.7	15	15	31	39

[1] "Posthole" technique used to obtain samples.

Soil Type: Nixa-like silt loam No. 8
Classification: Red-Yellow Podzolic
Area: Christian County (Key to map: 14)

Parent Material: Cherty limestone
Relief: Gently rolling
Drainage: Moderately well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-7	Dark brown (10YR 4/3) silt loam; moderate very fine granular structure.	24.7	21.0	16.4	10.0	6.9	0.204
A_1	7-10	Brown (10YR 5/3) silt loam; weak fine angular structure; faint mottling of yellowish brown (10YR 5/6); pH 4.7.	-	-	-	-	-	.204
B_{11}	10-13	Yellowish brown (10YR 5/4) silty clay loam; moderate platy to angular blocky structure; faint mottling of gray brown (10YR 5/2) and light brownish gray (10YR 6/2); pH 5.1 at 12".	-	-	-	-	-	.117
B_{21}	13-22	Dark yellowish brown (10YR 4/6) silty clay loam; weak fine granular structure; few small pebbles; pH 4.6 at 19".	23.7	21.6	19.4	16.5	14.1	.117
B_2	22-28	Variegated browns and grays with yellowish red (5YR 4/8) matrix, heavy silty clay loam; weak fine blocky structure; pH 4.4 at 25".	20.7	19.5	19.0	15.5	10.7	.147

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_p	0-7	1.45	1.5	4	28	52	16
A_1	7-10	-	-	-	-	-	-
B_{11}	10-13	-	-	-	-	-	-
B_{21}	13-22	1.56	.7	2	22	40	36
B_2	22-28	1.67	.6	1	28	42	29

Soil Type: Hagerstown silt loam No. 1
Classification: Red-Yellow Podzolic
Area: St. Francois County (Key to map: 15)

Parent Material: Limestone residuum
Relief: Rolling
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-7	Dark brown (7.5YR 4/4) friable heavy silt loam; moderately developed fine granular structure; pH 6.3.	26.3	24.3	19.8	14.8	12.4	0.169
A_3	7-10	Yellowish red (5YR 4/8) silty clay loam; moderately developed coarse granular structure; pH 6.2.	24.9	21.6	18.3	14.6	11.3	.136
B_1	10-12	Dark red (2.5YR 3/6) very firm light silty clay loam; well developed fine subangular blocky structure; pH 6.0.	-	-	-	-	-	.136
B_{21}	12-19	Dark red (2.5YR 3/6) very firm silty clay loam; well-developed fine subangular blocky structure; pH 4.6.	25.0	22.7	20.8	18.4	16.6	.086
B_{22}	19-25	Dark red (2.5YR 3/6) and yellowish red (5YR 4/6) mottled very firm silty clay loam; moderately developed medium subangular blocky structure; pH 4.8.	-	-	-	-	-	.086
B_{23}	25-33	Dark red (2.5YR 3/6) and reddish brown (5YR 4/4) mottled very light firm silty clay; moderately developed medium subangular blocky structure; numerous black coatings and large concretions; pH 4.8.	24.9	24.4	23.2	21.5	18.1	.098
B_{24}	33-43	Reddish brown (5YR 4/4) slightly plastic silty clay; poorly developed medium subangular blocky structure; numerous black coatings and large concretions; pH 4.8.	24.3	24.7	24.6	22.2	19.6	.077
B_3	43-54	Yellowish red (5YR 4/6) and light brown (7.5YR 6/4) mottled very plastic waxy clay; poorly developed fine subangular blocky structure; numerous concretions and many black coatings; pH 4.8.	-	-	-	-	-	.077

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_1	0-7	1.42	3.0	10	22	53	15
A_3	7-10	1.32	3.0	2	26	49	23
B_1	10-12	-	-	-	-	-	-
B_{21}	12-19	1.42	1.8	6	19	45	30
B_{22}	19-25	-	-	-	-	-	-
B_{23}	25-33	1.55	.9	7	17	44	32
B_{24}	33-43	1.51	1.0	7	17	40	36
B_3	43-54	-	-	-	-	-	-

Soil Type: Calhoun silt loam No. 102
Classification: Planosol
Area: Stoddard County (Key to map: 16)

Parent Material: Loess and alluvium
Relief: Nearly level
Drainage: Very poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-4	Dark gray brown (10YR 4/2) silt loam; some light gray mottling fine, faint, (10YR 7/2) and yellowish brown (10YR 5/6); weak very fine granular structure; slightly sticky when wet.	-	-	-	-	-	0.170
A_2	4-8	Gray brown (10YR 5/2) silt loam; mottling common, distinct and prominent; yellowish brown (10YR 5/6); dark brown (7.5YR 3/2) and yellowish red (5YR 5/6); indistinct platy and fine subangular blocky.	31.0	27.3	21.3	18.1	14.9	.170
B_{21}	8-12	Light brownish gray (10YR 6/2) silty clay loam; mottling common, prominent and distinct, of medium yellowish brown (10YR 5/6); brownish yellow (10YR 6/8); medium to fine subangular blocky structure.	-	-	-	-	-	.140
B_{22}	12-22	Light gray (10YR 7/2) to light brownish gray (10YR 6/2) silty clay to heavy silty clay loam; some very light gray mottling.	23.2	23.5	27.8	17.6	15.1	.140

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_1	0-4	-	-	-	-	-	-
A_2	4-8	1.37	1.8	15	18	42	25
B_{21}	8-12	-	-	-	-	-	-
B_{22}	12-22	1.67	.5	10	19	40	31

Soil Type: Calhoun silt loam no. 102
Classification: Planosol
Area: Stoddard County (Key to map: 17)

Parent Material: Loess and alluvium
Relief: Nearly level
Drainage: Very poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-2	Very dark gray brown (10YR 3/2) to dark gray brown (10YR 4/2) silt loam; faint mottling of dark gray brown (10YR 4/2) and dark yellowish brown (10YR 4/4); very fine weak granular structure.	-	-	-	-	-	0.130
A_{21}	2-6	Gray brown (10YR 5/2) silt loam; mottling common, faint, fine; dark yellowish brown (10YR 4/4); very fine weak granular structure; slightly sticky when wet.	22.5	21.2	18.0	12.3	11.1	.130
A_{22}	6-10	White (10YR 8/2), silt loam; mottling common and distinct, olive yellow (2.5Y 6/8).	-	-	-	-	-	.130
B_{11}	10-14	Gray (10YR 6/1) and light olive gray (5Y 6/2) silty clay loam; mottling common, medium, dark yellowish brown (10YR 4/4) and black (2.5Y 2/0); very fine subangular blocky structure.	-	-	-	-	-	.147
B_{12}	14-20	Gray (10YR 5/1) and gray brown (10YR 5/2) silty clay loam; some faint mottling dark brown (7.5YR 4/2); very fine moderate subangular blocky structure; sticky when wet.	28.6	25.2	25.2	16.7	15.1	.147
B_2	20-25	Gray (10YR 5/1) silty clay; some faint fine mottling, yellowish red (5YR 4/8) to light gray (5YR 7/1); fine moderate subangular blocky structure; sticky when wet.	-	-	-	-	-	.147
C	25-30	Similar to above layer, massive structure, plastic when wet.	26.1	24.7	22.5	20.4	17.2	.116

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_1	0-2	-	-	-	-	-	-
A_{21}	2-6	1.29	1.6	13	29	43	15
A_{22}	6-10	-	-	-	-	-	-
B_{11}	10-14	-	-	-	-	-	-
B_{12}	14-20	1.46	.7	10	24	36	30
B_2	20-25	-	-	-	-	-	-
C	25-30	1.55	.6	7	24	37	32

Soil Type: Guthrie silt loam No. 10
Classification: Planosol
Area: Lawrence County (Key to map: 18)

Parent Material: Limestone residuum
Relief: Nearly level
Drainage: Very poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-4	Dark gray (10YR 4/1) silt loam; splotches of (10YR 4/3 and 2/1); weak coarse platy structure; pH 5.0.	-	39.6	39.3	17.5	16.3	0.321
A_2	4-8	Gray (10YR 6/1) silt loam; white (10YR 8/1) when dry; massive structure; iron and magnesium concretions common. pH 4.5.	20.5	19.0	15.9	9.4	4.7	.238
A_3	8-12	Gray-brown (10YR 5/2) silty clay loam; weak fine angular blocky structure; iron and magnesium concretions.	22.6	20.7	19.9	15.9	14.0	.102
B_{21}	12-18	Dark yellowish to olive brown (2.5Y 4/4) silty clay; weak fine subangular blocky structure. Streaks and splotches of gray (5Y 5/0) and light brownish gray (10YR 6/2).	-	-	-	-	-	.127
B_{22}	18-28	Dark grayish brown (10YR 4/4) silty clay; mottling and streaks of dark yellowish brown (10YR 4/4). Weak fine subangular blocky structure; pH 4.0; some small pebbles.	31.3	31.1	27.0	26.8	22.1	.127
B_{3m}	28-34	Gray, dark gray, and brownish yellow (10YR 5/1, 4/1, and 6/8) silty clay loam; brittle when moist, hard when dry; (fragipan).	-	-	-	-	-	.127

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_1	0-4	1.38	2.2	8	28	54	10
A_2	4-8	1.67	.4	5	26	55	14
A_3	8-12	1.52	.7	3	17	42	38
B_{21}	12-18	-	-	-	-	-	-
B_{22}	18-28	1.41	.5	4	11	33	57
B_{3m}	28-34	-	-	-	-	-	-

Soil Type: Guthrie silt loam No. 10
Classification: Planosol
Area: Greene County (Key to map: 19)

Parent Material: Limestone residuum
Relief: Nearly level
Drainage: Very poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_{11}	0-4	Very dark gray brown (10YR 3/2) to dark gray brown (10YR 4/2) silt loam; strong very fine crumb structure; pH 4.8.	30.5	26.3	21.2	13.7	8.7	0.232
A_{12}	4-7	Dark Gray (10YR 4/1.5) to very dark gray brown (10YR 3/2) silt loam; weak medium granular structure.	-	-	-	-	-	.232
A_2	7-16	Pale brown (10YR 6/3) silt loam; weak fine subangular blocky structure; white (10YR 8/2) when dry; pH 4.5.	22.8	21.2	18.0	12.8	7.6	.210
B_2	16-26	Gray (10YR 6/1) silty clay; moderate medium subangular blocky structure; mottling of dark yellowish brown and yellowish brown (10YR 4/4, 5/8, 5/6); pH 4.1.	30.0	26.2	25.0	22.0	17.8	.112
B_{3m}	26-32	Variegated gray, very pale brown and yellowish red (10YR 5/1, 7/3 and 5YR 4/6) silty clay loam; pH 4.4. Fragipan.	21.3	21.0	20.2	19.9	16.1	.079

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_{11}	0-4	1.32	2.4	8	24	54	14
A_{12}	4-7	-	-	-	-	-	-
A_2	7-16	1.54	.7	3	24	53	20
B_2	16-26	1.34	.8	2	16	37	45
B_{3m}	26-32	1.61	.6	2	22	46	30

Soil Type: Putnam silt loam No. 15
Classification: Planosol
Area: Callaway County (Key to map: 20)

Parent Material: Loess
Relief: Nearly level
Drainage: Very poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-6	Very dark grayish brown (10YR 3/2) very friable silt loam; some oxide concretions, crumb structure.	29.0	28.1	23.3	13.7	8.7	0.250
A_2	6-18	Gray (10YR 6/1) mottled silt loam; numerous oxide concretions, weakly developed fine platy structure.	26.9	23.7	20.6	17.6	11.5	.175
B_2	18-36	Mottled clay dark grayish brown (10YR 4/2), light brownish gray (10YR 6/2) and yellowish red (5YR 5/6); very sticky and plastic, massive when wet, breaks into large subangular blocks when dry.	40.4	38.9	35.4	32.7	29.8	.111
B_3	36-48	Grayish brown (10YR 5/2) silty clay loam; distinct yellowish brown mottling; massive structure.	27.0	26.2	25.0	23.3	20.2	.091
	48+	Old buried profile	-	-	-	-	-	-

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_p	0-6	1.38	2.4	1	46	35	18
A_2	6-18	1.44	1.2	8	40	29	23
B_2	18-36	1.22	1.6	2	15	25	58
B_3	36-48	1.51	.9	2	25	36	37
	48+	-	-	-	-	-	-

Soil Type: Oswego silt loam No. 241
Classification: Planosol - Brunizem Intergrade
Area: Henry County (Key to map: 21)

Parent Material: Limestone-shale residuum
Relief: Gently rolling
Drainage: Poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-8	Very dark gray (10YR 3/1) silt loam; moderate very fine granular structure.	26.2	22.8	18.6	-	9.7	0.188
A_3	8-10	Colors same as above; silty clay loam or coarse silty clay; moderate very fine blocky structure.	-	-	-	-	-	.116
B_1	10-14	Colors same as above; silty clay loam; moderate fine blocky structure.	31.9	29.3	28.5	-	20.7	.116
B_{21}	14-26	Base color same as above with much fine, faint mottling of dark yellowish brown and dark brown; due to mottling layer has brownish cast; silty clay; weak very fine blocky structure.	36.5	35.2	32.4	-	26.6	.118
B_{22}	26-30	Variegated dark gray, dark gray brown, very dark gray brown and yellowish brown (10YR 4/1, 4/2, 3/2, 5/6), silty clay loam; massive structure.	-	-	-	-	-	.158
B_{31}	30-37	Gray (10YR 5/1) silty clay loam; splotches of yellowish brown (10YR 5/6); massive structure.	22.1	21.3	19.2	13.4	11.9	.158
B_{32}	37-60	Variegated yellowish to dark yellowish brown (10YR 5/4 - 4/4) and gray (2.5Y 5/1 - 6/1) silty clay loam. Gray increasing at 60".	-	-	-	-	-	.158
C	60-76	Light gray (2.5Y 7/0) silty clay loam; black mottling of manganese and splotches of yellowish brown (10YR 5/6).	-	-	-	-	-	-

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_1	0-8	1.43	3.3	6	32	49	13
A_3	8-10	-	-	-	-	-	-
B_1	10-14	1.35	2.4	4	18	38	40
B_{21}	14-26	1.31	1.7	4	14	37	45
B_{22}	26-30	-	-	-	-	-	-
B_{31}	30-37	1.68	.9	6	28	42	24
B_{32}	37-60	-	-	-	-	-	-
C	60-76	-	-	-	-	-	-

MMS 41-34
Apr 1960

Soil Type: Mexico silt loam No. 24
Classification: Planosol - Brunizem Intergrade
Area: Callaway County (Key to map: 22)

Parent Material: Loess
Relief: Gently rolling
Drainage: Poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-7	Very dark grayish brown (10YR 3/2 moist), (10YR 5/2) dry friable silt loam; weakly developed fine granular structure; numerous soft dark concretions.	26.0	22.4	18.4	14.9	9.76	0.191
A_3	7-11	Dark grayish brown (10YR 4/2) heavy silt loam; fine splotching of dark yellowish brown (10YR 4/4). Weakly developed fine and medium granular structure.	28.0	25.3	23.2	20.2	14.5	.143
B_{21}	11-16	Dark grayish brown (10YR 4/2) silty clay, highly mottled with yellowish red (5YR 4/6); numerous small concretions; very fine moderately developed angular blocky structure with thin clay skins on some aggregate faces.	41.2	38.5	37.1	36.9	29.5	.103
B_{22}	16-25	Dark grayish brown (10YR 4/2) silty clay; fine reddish brown mottling (5YR 4/4); numerous very small dark concretions; plastic when wet and breaks indistinctly into fine angular aggregates; thin clay coating on aggregate faces.	40.8	38.2	32.3	35.7	25.4	.123
B_3	25-34	Brown (10YR 5/3) silty clay; large splotches of yellowish brown (10YR 5/6) and yellowish red (5YR 5/8); massive structure.	28.0	27.8	25.5	25.3	20.3	.115
C	34-50	Grayish brown (10YR 5/2) light silty clay; splotches of strong brown (7.5YR 5/8) and soft dark red (2.5YR 3/6) concretions; massive structure.	26.7	25.0	20.4	22.1	16.7	.132

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_p	0-7	1.51	2.3	1	41	46	12
A_3	7-11	1.33	1.9	2	20	50	28
B_{21}	11-16	1.14	1.7	4	9	37	50
B_{22}	16-25	1.31	1.7	4	13	35	48
B_3	25-34	1.53	.9	18	10	36	36
C	34-50	-	.7	5	22	44	29

Soil Type: Gerald silt loam No. 24
Classification: Planosol--Brunizem Intergrade
Area: Lawrence County (Key to map: 23)

Parent Material: Limestone-shale residuum
Relief: Nearly level
Drainage: Poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-4	Very dark gray (10YR 3/1) silt loam; moderate fine granular structure.	-	-	-	-	-	0.266
A_1	4-10	Dark gray brown (10YR 4/2) silt loam; strong fine granular structure.	37.7	34.5	26.6	19.4	13.6	.266
A_3	10-16	Gray brown (10YR 5/2) silt loam; weak fine granular structure; faint mottling of yellowish brown (10YR 5/6).	25.8	23.7	18.8	13.2	9.1	.210
B_1	16-18	Gray brown (10YR 5/2) silty clay loam; moderate fine subangular blocky structure; frequent prominent red mottling.	26.5	23.6	19.6	18.8	12.9	.150
B_{21}	18-28	Gray (10YR 5/1) clay; strong fine subangular blocky structure; frequent prominent mottling of red (2.5YR 4/8).	34.9	33.5	33.0	29.5	24.8	.166
B_{22}	28-31	Gray (5Y 5/1) clay; no chert.	-	-	-	-	-	.166

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_p	0-4	-	-	-	-	-	-
A_1	4-10	1.27	2.8	7	26	51	16
A_3	10-16	1.44	1.4	8	27	44	21
B_1	16-18	1.42	1.0	7	19	37	37
B_{21}	18-28	1.29	1.0	5	10	29	56
B_{22}	28-31	-	-	-	-	-	-

Soil Type: Unnamed silt loam No. 116
Classification: Brunizem
Area: Carroll County (Key to map: 24)

Parent Material: Loess
Relief: Gently rolling
Drainage: Imperfect

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-10	Very dark gray (10YR 2/1 - 3/1) when dry--(black when moist) silt loam; very friable when moist; soft when dry; strong very fine granular structure.	30.7	26.4	22.0	17.6	13.3	0.167
A_3	10-17	Dark gray (10YR -4/1) when dry (black when moist) silt loam; very friable when moist, soft when dry; moderate very fine granular structure.	25.5	23.4	19.6	16.9	13.2	.141
B_1	17-23	Black (10YR 2.5/1) to very dark gray silt loam; slightly hard when dry; weak, very fine subangular blocky structure.	-	-	-	-	-	.141
B_{21}	23-28	Black (10YR 2/1) silty clay loam; barely firm when moist, hard when dry; weak medium subangular blocky structure; clay skins on peds. Interior of peds mottled black, yellowish brown, grayish brown and yellowish red (10YR 2/1 - 5/6) (2.5Y 5/2) (5YR 4/8).	28.3	26.8	25.5	23.3	18.6	.121
B_{22}	28-46	Very dark gray (10YR 3/1) silty clay loam; mottling with (2.5Y 5/2) (10YR 5/6) (5YR 5/6); firm when moist, hard when dry; weak coarse blocky structure; clay skins on 75% ped surfaces.	28.3	26.8	25.5	23.3	18.6	.150
B_3	46-60	Gray brown (2.5Y 5/2) and strong brown (7.5YR 5/6) mottled silty clay loam.	-	-	-	-	-	-
C	60-70	Gray brown (2.5Y 5/2) massive friable silt loam.	-	-	-	-	-	-

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_1	0-10	1.27	4.1	7	31	47	15
A_3	10-17	1.39	2.2	8	30	39	23
B_1	17-23	-	-	-	-	-	-
B_{21}	23-28	1.47	1.2	6	26	35	33
B_{22}	28-46	1.47	.5	6	30	35	29
B_3	46-60	-	-	-	-	-	-
C	60-70	-	-	-	-	-	-

Soil Type: Marshall silt loam No. 14
Classification: Brunizem
Area: Lafayette County (Key to map: 25)

Parent Material: Loess
Relief: Rolling
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-17	Very dark brown (10YR 2/2) silt loam; very friable when moist; soft when dry; strong very fine granular structure; pH 7.0.	25.3	21.7	17.6	13.5	8.1	0.189
B_1	17-22	Very dark brown (10YR 2.5/2) to very dark gray brown (10YR 3/2) heavy silt loam; friable when moist, slightly hard when dry; moderate fine granular structure; pH 7.5.	27.0	22.3	18.7	15.5	10.7	.156
B_{21}	22-27	Very dark brown (10YR 2.5/2;) brown (10YR 4.5/3) or dark brown dry, silty clay loam; friable; slightly hard, dry; moderate very fine subangular blocky structure.	-	-	-	-	-	.156
B_{22}	27-42	Dark brown (10YR 4/3) silty clay loam; friable, moist; slightly hard, dry; moderate fine subangular blocky structure; pH 5.0.	26.1	22.8	19.8	16.6	12.0	.146
B_3	42-59	Variegated gray brown (2.5Y 5/2) strong brown (7.5YR 5/6) and dark brown (10YR 4/3) heavy silt loam. Friable when moist; hard when dry; weak coarse subangular blocky structure.	26.2	24.0	22.0	19.6	15.2	.131
C	59-72	Gray brown (10YR 5/2) silt loam; friable when moist, soft when dry; massive structure; few medium distinct strong brown (7.5YR 5/6); mottling.	-	-	-	-	-	.131

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_1	0-17	1.39	2.5	7	41	35	17
B_1	17-22	1.35	2.4	5	38	36	21
B_{21}	22-27	-	-	-	-	-	-
B_{22}	27-42	1.36	1.7	5	33	35	27
B_3	42-59	1.49	.7	6	34	35	25
C	59-72	-	-	-	-	-	-

Soil Type: Marshall silt loam No. 14
Classification: Brunizem
Area: Nodaway County (Key to map: 26)

Parent Material: Loess
Relief: Rolling
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-6	Very dark brown (10YR 2/2) heavy silt loam; friable fine crumb structure; pH 7.4.	28.5	24.6	22.1	19.5	17.5	0.095
A_1	6-12	Very dark gray (10YR 3/1) silty clay loam; very dark gray brown (10YR 3/2) crushed; very friable fine crumb structure; pH 6.8.	28.7	26.4	24.0	21.1	17.6	.116
AB	12-24	Very dark gray brown (10YR 3/2) silty clay loam; dark gray brown (10YR 4/2) crushed; very friable fine subangular blocky structure; pH 5.8.	28.7	26.5	25.0	22.1	19.4	.097
B_1	24-36	Dark brown (10YR 4/3) silty clay loam; some mottling of light yellowish brown (10YR 6/4); friable subangular blocky structure; fine iron concretions; pH 6.4.	27.3	26.2	24.5	21.4	19.4	.097
B_2	36-48	Dark brown (10YR 4/3) silty clay loam; splotches and streaks of light brownish gray (10YR 6/2); fine to medium subangular blocky structure; small iron concretions; pH 6.4.	26.9	26.4	24.0	19.6	17.9	.122
C	48-60	Mottled dark brown (10YR 4/3) light yellowish brown (10YR 6/4), brown (10YR 5/3) friable silty clay loam; structureless.	29.2	27.9	26.0	22.3	18.5	.137

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_p	0-6	1.34	3.2	4	33	35	28
A_1	6-12	1.31	2.5	1	32	33	34
AB	12-24	1.37	1.7	1	30	31	38
B_1	24-36	1.43	1.0	1	30	33	36
B_2	36-48	1.44	.9	3	33	31	33
C	48-60	1.46	.4	4	32	35	29

Soil Type: Sharpsburgh silt loam No. 22
Classification: Brunizem
Area: Gentry County (Key to map: 27)

Parent Material: Loess
Relief: Rolling
Drainage: Moderately Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-6	Very dark brown (10YR 2/2) silt loam; very dark gray brown (10YR 3/2) crushed; friable crumb structure; pH 6.2.	29.7	26.0	21.7	20.0	15.2	0.129
A_1	6-15	Very dark gray brown (10YR 3/2) silt loam; dark gray brown crushed; friable fine to medium crumb structure; pH 5.6.	27.8	26.1	22.9	20.7	16.7	.113
B_2	15-30	Dark gray brown (10YR 4/2) silty clay loam; dark brown (10YR 4/3) crushed; some mottling of dark yellowish brown (10YR 4/4); fine to medium subangular blocky structure; small iron concretions present; pH 6.0.	27.4	27.1	25.7	23.5	19.4	.107
B_3	30-40	Yellowish brown (10YR 5/4) heavy silt loam; medium to coarse subangular blocky structure; large streaks and splotches of gray brown (10YR 5/2); numerous iron concretions; pH 6.2.	20.2	19.1	18.4	14.3	11.0	.133

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_p	0-6	1.19	4.6	3	34	41	22
A_1	6-15	1.20	3.1	3	29	40	28
B_2	15-30	1.39	1.2	3	24	36	37
B_3	30-40	1.65	.4	27	21	32	20

Soil Type: Shelby loam No. 16
Classification: Brunizem
Area: Harrison County (Key to map: 28)

Parent Material: Glacial till
Relief: Rolling
Drainage: Moderately well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-9	Very dark brown (10YR 2/2) loam; fine crumb structure; pH 6.0.	24.1	20.5	19.6	17.0	13.0	0.112
B_1	9-14	Very dark gray brown (10YR 3/2) clay loam; very fine blocky structure; organic staining present; pH 5.6.	22.4	20.3	19.3	17.7	14.4	.092
B_{21}	14-20	Dark brown (10YR 4/3) clay loam; mottling of yellowish brown (10YR 5/6); dark gray coatings of (10YR 4/1) fine blocky structure; pH 5.8.	26.9	24.4	23.6	22.5	17.2	.112
B_{22}	20-27	Yellowish brown (10YR 5/4) sandy clay; mottling light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6); medium subangular blocky structure; pH 5.4.	26.2	24.9	22.5	22.4	19.5	.085
B_{31}	27-33	Layer of glacial sand gravel and rock.	-	-	-	-	-	-
B_{32}	33-40	Yellowish brown (10YR 5/4) clay loam with coatings of gray (10YR 5/1); pH 7.8.	21.5	19.6	19.6	18.6	14.8	.096

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_1	0-9	1.49	3.6	34	15	37	14
B_1	9-14	1.55	1.9	31	14	21	34
B_{21}	14-20	1.55	1.4	24	10	19	47
B_{22}	20-27	1.57	1.0	32	7	17	44
B_{31}	27-33	-	-	-	-	-	-
B_{32}	33-40	1.77	.4	28	10	25	37

Soil Type: Shelby loam No. 16 (virgin)
Classification: Brunizem
Area: Harrison County (Key to map: 29)

Parent Material: Glacial till
Relief: Rolling
Drainage: Moderately well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_{11}	0-7	Very dark brown (10YR 2/2) loam; very fine crumb structure; pH 5.8.	23.9	21.2	20.0	17.3	12.1	0.121
A_{12}	7-12	Very dark gray brown (10YR 3/2) loam; fine crumb structure; pH 5.6.	20.8	19.1	16.7	14.5	11.8	.107
B_1	12-20	Dark yellowish brown (10YR 4/4) clay loam; friable fine subangular blocky structure; streaks and splotches of dark brown (10YR 3/3) on aggregates; some gray (10YR 6/2) mottling; pH 6.2.	20.8	18.7	17.6	15.7	12.8	.086
B_2	20-36	Yellowish brown (10YR 5/4) clay loam; medium subangular blocky structure; mottling of gray (10YR 6/2) and brown (7.5YR 5/4); pH 7.4.	18.0	17.1	15.8	13.8	11.2	.094

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_{11}	0-7	1.33	3.3	52	8	18	22
A_{12}	7-12	1.47	1.7	49	7	18	26
B_1	12-20	1.46	1.4	45	7	18	30
B_2	20-36	1.59	.8	42	7	23	28

Soil Type: Grundy silt loam No. 11
Classification: Brunizem- Humic Gley Intergrade
Area: Harrison County (Key to map: 30)

Parent Material: Loess
Relief: Gently rolling
Drainage: Poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_{11p}	0-7	Black (10YR 2/1) silt loam; fine granular structure; pH 7.0; (high pH probably due to gravel road dust.)	34.5	31.1	25.5	20.1	13.1	0.201
A_{12}	7-18	Very dark gray (10YR 3/1 moist); (10YR 4/1 dry) silt loam; very fine subangular blocky structure; pH 6.8.	26.6	25.4	21.3	18.8	12.8	.179
B_{21}	18-30	Very dark gray (10YR 3/1 silty clay; fine subangular blocky structure; mottling of yellow brown (10YR 5/8) and strong brown (7.5YR 5/6). Aggregates coated with thin film organic matter; iron concretions present; pH 5.7.	37.6	35.6	35.2	31.9	25.6	.127
B_{22}	30-38	Very dark gray (10YR 3/1) silty clay mottled with gray brown (10YR 5/2) and occasional specks of yellow brown (10YR 5/4); massive structure; color lighter and texture coarser at greater depth; pH 6.6.	30.9	31.8	30.5	28.3	24.4	.108

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_{11p}	0-7	1.12	4.0	4	32	48	16
A_{12}	7-18	1.42	1.7	4	28	41	27
B_{21}	18-30	1.28	1.0	5	15	29	51
B_{22}	30-38	1.45	.7	3	19	34	44

Soil Type: Bolivar sandy loam No. 23
Classification: Brunizem-Reddish Prairie Intergrade
Area: Greene County (Key to map: 31)

Parent Material: Sandstone residuum
Relief: Rolling
Drainage: Moderately well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-9	Dark grayish brown (10YR 4/2) fine sandy loam or coarse loam; moderate fine crumb structure; small broken sandstone.	14.7	14.4	11.0	6.1	3.8	0.182
A_3	9-12	Yellowish brown (10YR 5/4) sandy clay loam; weak fine granular structure.	13.8	13.1	11.9	6.7	4.3	.156
B_1	12-21	Dark brown (7.5YR 4/4) to (10YR 4/3) clay loam; weak fine subangular blocky structure.	16.6	15.3	16.3	10.7	9.7	.075
B_2	21-24	Variegated (7.5YR 6/8) (5YR 4/8 & 3/4), reddish yellow (7.5YR 6/8), yellowish red (5YR 5/8) and dark reddish brown (5YR 3/4) clay loam; weak fine subangular blocky structure.	-	-	-	-	-	.075
B_3	24-30	[1]Yellowish red (5YR 4/8) clay loam; mottling of dark reddish brown (5YR 3/4) and reddish yellow (5YR 6/6); 50% of material broken sandstone less than 3" diameter.	-	-	-	-	-	.075

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_1	0-9	1.71	1.8	58	13	21	8
A_3	9-12	1.77	.9	52	13	19	16
B_1	12-21	1.76	.9	45	12	19	24
B_2	21-24	-	-	-	-	-	-
B_3	24-30	-	-	-	-	-	-

[1] Depth to stone varies with place.

Soil Type: Newtonia silt loam No. 1
Classification: Reddish Prairie
Area: Greene County (Key to map: 32)

Parent Material: Limestone residuum
Relief: Nearly level
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-4	Dark brown (7.5YR 3/2) silt loam; strong fine granular structure.	28.0	25.0	23.0	13.2	9.0	0.227
A_3	4-7	Same as above except moderate coarse platy structure pH 6.8.	-	-	-	-	-	.227
B_1	7-13	Dark reddish brown (5YR 3/2.5) silty clay loam; moderate coarse granular structure; pH 6.8.	25.6	22.6	20.7	14.7	10.3	.123
B_{21}	13-17	Dark reddish brown (5YR 3/3) silty clay loam; moderate very fine blocky structure; chert fragments present in rest of profile.	-	-	-	-	-	.108
B_{22}	17-24	Dark reddish brown (5YR 3/3.8) silty clay loam; moderate fine blocky structure; pH 6.0.	24.0	23.1	20.3	16.5	12.3	.108
C	24 +	[1]Dark red (2.5YR 3/6) silty clay loam; friable chert present in size from pebbles to large stones.	27.0	25.5	23.7	21.5	15.8	.093

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_1	0-4	1.42	3.6	8	32	44	16
A_3	4-7	-	-	-	-	-	-
B_1	7-13	1.42	2.7	4	29	43	24
B_{21}	13-17	-	-	-	-	-	-
B_{22}	17-24	1.43	1.9	3	27	41	29
C	24 +	1.39	1.8	8	22	36	29

[1] Depth to chert varies with place. Data for this horizon determined on soil and stone separately. Bulk density of soil only.

Soil Type: Newtonia silt loam No. 1
Classification: Reddish Prairie
Area: Greene County (Key to map: 33)

Parent Material: Limestone residuum
Relief: Nearly level
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-6	Dark reddish brown (5YR 2/2) very friable silt loam; fine granular structure; pH 7.5.	26.3	21.4	17.2	11.2	7.6	0.185
A_1	6-12	Dark reddish brown (5YR 2/2) very friable silt loam; moderate prismatic breaking to fine granular structure.	23.6	21.4	17.6	12.1	9.5	.169
B_{21}	12-24	[1]Dark reddish brown (5YR 3/3) friable silty clay loam to silty clay; strong fine granular structure; pH 6.4.	22.1	20.3	18.7	15.3	12.4	.114
B_{22}	24-36	[2]Same as above - clay gradually increasing, fine subangular blocky structure.	27.5	24.1	20.9	18.8	16.4	.118
B_3	36-40	Dark red (2.5YR 3/6) silty clay loam; strong very fine blocky structure; pH 6.4.	-	-	-	-	-	.118

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_p	0-6	1.34	2.4	5	34	47	14
A_1	6-12	1.42	1.9	2	29	49	20
B_{21}	12-24	1.44	1.5	3	26	44	27
B_{22}	24-36	1.39	1.4	28	8	21	43
B_3	36-40	-	-	-	-	-	-

[1] Depth to stone varies with place.
[2] Data determined on soil and stone separately. Bulk density of soil only.

Soil Type: Eldorado silt loam No. 30[1]
Classification: Lithosol
Area: Lawrence County (Key to map: 34)

Parent Material: Limestone residuum
Relief: Rolling
Drainage: Excessive

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_{11}	0-7	Black to very dark brown (10YR 2/1.5) silt loam; strong fine granular structure; some chert.	24.4	21.7	16.6	12.7	8.2	0.192
A_{12}	7-14	Very dark brown (10YR 2/2) silt loam; strong fine granular structure; increasing small rock (est. 40 percent).	20.2	23.0	19.1	15.3	11.5	.111
A_{13}	14-20	Very dark gray brown (10YR 3/2) silt loam; strong very fine granular structure; increasing rock quantity and size (est. 50 percent).	19.9	22.4	19.1	16.8	13.6	.075
C	20-30+	Reddish brown (5YR 4/4), brown (7.5YR 5/4), red (2.5YR 4/6) loam to clay loam; stone, (65-90 percent).	19.4	21.7	18.7	16.4	13.9	.093

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_{11}	0-7	1.43	3.3	4	40	42	14
A_{12}	7-14	1.22	2.7	14	27	41	18
A_{13}	14-20	1.02	1.8	17	23	37	23
C	20-30+	1.61	1.4	24	20	31	25

[1] Data determined on soil and stone separately. Bulk density of soil only.

Soil Type: Beulah loamy sand No. 643
Classification: Alluvial
Area: New Madrid County (Key to map: 35)

Parent Material: Sandy alluvium
Relief: Undulating
Drainage: Excessive

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_{11}	0-10	Very dark gray brown (10YR 3/2) loamy sand; very friable when moist; with single grain structure.	6.7	5.0	3.9	3.4	2.5	0.041
A_{12}	10-16	Dark brown (7.5YR 3/2) loamy sand; very friable when moist; single grain structure; few faint medium size mottlings; dark brown (7.5YR 4/4).	8.3	7.5	5.7	4.9	3.3	.071
C	16-26+	Dark yellowish brown (10YR 4/4) loamy sand single grain structure; very friable when moist.	8.3	7.2	5.6	4.8	3.4	.061

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_{11}	0-10	1.65	0.5	89	4	4	3
A_{12}	10-16	1.68	.7	86	4	6	4
C	16-26+	1.60	.9	83	4	7	6

Soil Type: Beulah loamy sand No. 643
Classification: Alluvial
Area: Dunklin County (Key to map: 36)

Parent Material: Sandy alluvium
Relief: Undulating
Drainage: Excessive

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-11	Dark brown (10YR 4/3) loamy sand; single grain structure.	6.3	4.3	4.0	3.2	1.9	0.038
C_1	11-20	Dark reddish brown (5YR 3/4) loamy sand; single grain structure.	9.1	6.3	5.1	4.4	3.3	.050
C_2	20-40	Reddish brown (5YR 4/4) loamy sand; some light splotches present; single grain structure.	8.5	6.4	4.3	4.3	3.2	.050
C_3	40-50	Reddish brown (5YR 4/4) loamy sand; weak sub-angular blocky structure; mottling common; very dark brown (10YR 2/2) to very dark gray brown (10YR 3/2).	9.5	7.7	7.6	5.9	3.8	.065

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_1	0-11	1.59	1.0	90	5	2	3
C_1	11-20	1.52	.8	81	7	6	6
C_2	20-40	1.57	.4	83	6	5	6
C_3	40-50	1.68	.6	76	9	7	8

Soil Type: Commerce silt loam No. 672
Classification: Alluvial
Area: New Madrid County (Key to map: 37)

Parent Material: Silty alluvium
Relief: Nearly level
Drainage: Moderately well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
1	0-12	Very dark gray brown (10YR 3/2 to 10YR 4/2) silt loam; very fine weak granular structure; friable, crushing easily when moist; pH 7.0.	22.7	21.1	17.7	13.6	11.0	0.166
2	12-36	Dark gray brown (10YR 4/2) fine sandy loam; structure and consistence same as above; mottlings fine, common and distinct; reddish brown (5YR 3/4), dark yellowish brown (10YR 4/4) and gray (10YR 5/1); appearance more prominent with depth.	30.2	23.5	16.1	12.1	11.2	.165

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
1	0-12	1.65	1.7	12	33	43	12
2	12-36	1.34	.6	21	42	25	12

Soil Type: Falaya silt loam No. 672
Classification: Alluvial
Area: Stoddard County (Key to map: 38)

Parent Material: Alluvium
Relief: Nearly level
Drainage: Poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
1	0-6	Dark gray brown (10YR 4/2) silt loam mottled with dark reddish brown (5YR 3/4) and gray (5YR 6/1) very fine weak granular structure; slightly sticky when wet.	29.5	21.1	13.1	9.0	6.5	0.204
2	6-14	Gray brown (10YR 5/2) silt loam; mottling common with medium yellowish red (5YR 4/6) and reddish yellow (5YR 6/6); very fine weak subangular blocky structure; slightly sticky when wet.	27.4	21.6	12.9	8.6	6.5	.218
3	14-27	Light brownish gray (10YR 6/2) to light brownish gray (2.5Y 6/2) silt loam; mottling common and prominent, medium brownish yellow (10YR 6/8) and dark brown (10YR 4/3); fine weak subangular structure; slight sticky when wet.	29.1	24.9	13.9	10.9	8.3	.240
4	27-32	Light gray (10YR 7/2) to light brownish gray (2.5Y 6/2) silt loam; mottling common and prominent, brownish yellow (10YR 6/8) and dark brown (10YR 4/3); very fine moderate subangular structure; slightly sticky when wet.	26.7	24.5	17.0	13.8	8.8	.234
5	32-40	Light gray (5Y 7/2) silt loam; mottling prominent, dark brown (7.5YR 4/4) and brown (7.5YR 5/2); very fine weak subangular blocky structure, massive in places; sticky when wet.	26.5	23.6	15.3	13.5	9.8	.210

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
1	0-6	1.40	1.6	6	34	52	8
2	6-14	1.44	1.0	4	35	53	8
3	14-27	1.45	.7	4	32	48	16
4	27-32	1.49	.7	7	34	46	13
5	32-40	1.52	.7	7	34	47	12

Soil Type: Sarpy fine sandy loam No. 64
Classification: Alluvial
Area: Carroll County (Key to map: 39)

Parent Material: Sandy alluvium
Relief: Nearly level
Drainage: Excessive

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
1	0-6	Very dark gray brown (10YR 3.8/2) fine sandy loam; moderate very fine granular structure.	17.5	14.1	12.9	10.2	8.0	0.098
2	6-9	Very dark to dark gray brown (10YR 3.5/2) fine sandy loam; (small clods of clay loam material present); moderate fine crumb to very fine granular structure.	-	-	-	-	-	.098
3	9-36	Salt and pepper mixture of dark gray brown (10YR 4/2) and light brownish gray (10YR 6/2) very fine sand or loamy fine sand; weak angular blocky structure when moist, single grain when dry.	10.5	4.8	4.6	3.8	3.3	.021

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
1	0-6	1.60	1.3	57	15	15	13
2	6-9	-	-	-	-	-	-
3	9-36	1.42	.7	87	7	2	4

Soil Type: Sarpy loamy sand No. 61
Classification: Alluvial
Area: Carroll County (Key to map: 40)

Parent Material: Sandy alluvium
Relief: Nearly level
Drainage: Moderately well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
1	0-7	Gray brown (10YR 5/2) loamy fine sand; weak crumb structure.	14.6	7.8	6.4	5.6	4.1	0.055
2	7-20	Light brownish gray (10YR 6/2) and white (10YR 8/1); fine to medium sand; single grain structure.	6.6	2.8	2.8	2.4	2.1	.009
3	20-30	Dark gray (5Y 4/1) very fine sandy loam; streaks of rusty colored organic materials (2.5YR 3/4).	29.6	13.4	11.7	7.7	6.1	.104
4	30-34	Dark gray (10YR 4/1) coarse sandy clay loam.	32.9	34.1	33.8	27.4	19.0	.194

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
1	0-7	1.49	0.7	71	15	7	8
2	7-20	1.37	.7	95	0	1	4
3	20-30	1.42	.8	65	17	10	8
4	30-34	1.28	1.6	30	19	22	29

Soil Type: Onawa silty clay No. 57
Classification: Alluvial
Area: Carroll County (Key to map: 41)

Parent Material: Fine textured alluvium
Relief: Nearly level
Drainage: Somewhat poorly

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
1	0-7	Black (10YR 2/1) silty clay; fine to medium strong blocky structure.	32.2	31.0	29.8	26.5	21.6	0.120
2	7-13	Black (10YR 2/1) silty clay; fine to medium strong blocky structure.	38.5	37.7	36.1	32.8	27.1	.128
3	13-28	Very dark gray brown (10YR 3/2) silty clay or clay; fine moderate structure.	27.8	32.7	29.9	26.7	24.2	.118
4	28-37	Very dark gray brown (10YR 3/2) sandy clay loam; fine to medium subangular blocky structure; mottling of dark brown (10YR 4/3) common, coarse and distinct.	19.0	16.5	13.8	13.8	11.0	.087
5	37-48	Dark gray brown (10YR 4/2) and dark yellowish brown (10YR 4/4) loamy sand; medium weak angular blocky structure.	-	-	-	-	-	.087

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
1	0-7	1.28	3.1	5	14	39	42
2	7-13	1.20	3.7	9	7	37	47
3	13-28	1.38	1.3	20	7	23	50
4	28-37	1.58	1.0	54	11	6	29
5	37-48	-	-	-	-	-	-

Soil Type: Huntington silt loam No. 66
Classification: Alluvial
Area: Greene County (Key to map: 42)

Parent Material: Silty alluvium
Relief: Nearly level
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
1	0-6	Very dark gray brown (10YR 3/2) silt loam; weak very fine granular structure; pH 6.7.	25.8	21.2	16.0	12.3	10.3	0.150
2	6-12	Color same as above; silt loam; structure same as above; pH 5.9.	-	-	-	-	-	.150
3	12-24	Color same as above; silty clay loam; moderate coarse granular structure; pH 6.9.	25.6	21.5	17.9	13.1	9.6	.119
4	24-32	Dark yellowish brown (10YR 3/4) silt loam; weak fine to medium subangular blocky structure; pH 6.8; No mottling to 48" becomes more compact at 36".	21.2	19.4	16.8	14.0	10.5	.137

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
1	0-6	1.38	2.7	5	37	45	13
2	6-12	-	-	-	-	-	-
3	12-24	1.38	2.1	8	35	39	18
4	24-32	1.54	.6	9	34	36	21

Soil Type: Sharon silt loam No. 66
Classification: Alluvial
Area: Lincoln County (Key to map: 43)

Parent Material: Silty alluvium
Relief: Nearly level
Drainage: Well

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
1	0-8	Light yellowish brown (10YR 6/4) to pale brown (10YR 6/3) silt loam; weakly developed fine granular structure.	25.2	21.6	16.3	12.6	9.2	0.188
2	8-15	Light yellowish brown (10YR 6/4) silt loam.	24.9	21.7	16.5	14.0	8.7	.195
3	15-27	Light yellowish brown (10YR 6/4) silt loam; slight mottling and gray coatings in lower part.	26.6	21.9	16.9	13.5	9.9	.167
4	27-35	Light yellowish brown (10YR 6/4) to brownish yellow (10YR 6/6) silt loam.	25.9	22.3	17.2	12.8	9.1	.196

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
1	0-8	1.52	1.9	1	48	45	6
2	8-15	1.50	1.5	1	48	43	8
3	15-27	1.39	1.3	9	42	40	9
4	27-35	1.48	.8	11	42	40	7

Soil Type: Alligator-like clay loam No. 79[1]
Classification: Low-Humic-Gley
Area: New Madrid County (Key to map: 44)

Parent Material: Fine textured alluvium
Relief: Nearly level
Drainage: Very poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-5	Very dark gray (10YR 3/1) clay loam; fine weak subangular blocky structure; very firm when moist; pH 5.4.	20.7	20.8	19.2	17.2	15.6	0.087
C_1g	5-14	Dark gray to gray (5Y 4/1 - 5/1) clay loam; fine to medium weak subangular structure; extremely firm when moist; pH 4.6; mottling frequent, prominent and coarse with dominant colors; dark brown (7.5YR 4/4) and yellowish red (5YR 5/8).	24.9	23.5	22.6	18.9	17.5	.096
C_2g	14-24	Gray (5Y 5/1) clay; weak fine subangular blocky structure; extremely firm when moist; pH 4.6; mottling same as above but not as abundant.	26.9	25.9	25.4	21.6	17.9	.113

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
A_p	0-5	1.67	2.1	40	7	24	29
C_1g	5-14	1.59	1.0	37	7	20	36
C_2g	14-24	1.53	.6	33	6	20	41

[1] May be correlated as Crowder clay loam.

Soil Type: Sharkey-like clay No. 59[1]
Classification: Low-Humic-Gley
Area: Pemiscot County (Key to map: 45)

Parent Material: Fine textured alluvium
Relief: Nearly level
Drainage: Very poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
1	0-5	Dark gray (10YR 4/1) clay; fine medium granular structure; very sticky when wet.	34.2	30.7	30.1	27.7	24.3	0.091
2	5-18	Gray (10YR 5/1 - 6/1) clay; mottling frequent to common and prominent dark reddish brown (2.5YR 2/4) and faint yellowish brown (10YR 5/6); weak to moderate blocky structure.	40.3	34.6	33.9	30.4	27.7	.093
3	18-24	Gray (10YR 5/1 - 6/1) clay; medium coarse blocky structure; slightly mottled with yellowish brown (10YR 5/6) and dark reddish brown (2.5YR 2/4).	43.1	38.7	37.6	33.0	29.4	.121
4	24-30	Similar to above layer, becoming more uniformly gray color, less distinct mottlings, and slightly higher in clay content.	44.0	41.0	38.7	34.7	36.8	.113

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
1	0-5	1.42	2.8	9	6	33	52
2	5-18	1.36	1.4	4	4	29	63
3	18-24	1.30	2.3	3	2	34	61
4	24-30	1.23	1.6	3	5	26	66

[1] May be correlated as Alligator clay.

Soil Type: Waverly silt loam No. 762
Classification: Low-Humic-Gley
Area: Stoddard County (Key to map: 46)

Parent Material: Alluvium
Relief: Nearly level
Drainage: Very poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
1	0-4	Gray (10YR 6/1) to light brownish gray (10YR 6/2) silt loam; mottling common faint medium light gray (10YR 7/1); very fine weak granular structure; slightly sticky when wet.	25.1	24.1	19.6	12.1	8.7	0.237
2	4-8	Gray brown (10YR 5/2) silt loam. Mottling faint very dark gray (10YR 3/1) and gray (10YR 6/1); very fine weak subangular blocky structure; slightly sticky when wet.	-	-	-	-	-	.237
3	8-13	Gray (10YR 6/1) silt loam; some mottling, faint fine dark reddish brown (5YR 3/4) and gray (2.5Y 6/0); fine weak subangular blocky structure; slightly sticky when wet.	24.8	21.9	16.3	13.2	8.8	.187
4	13-20	Gray (2.5Y 6/0) silt loam; mottling common, fine strong brown (7.5YR 5/6); and brown (10YR 5/3); fine weak subangular blocky structure; slightly sticky when wet.	27.4	25.6	20.7	18.3	13.5	.179
5	20-32	White (2.5Y 8/0) heavy silt loam; mottling common, coarse, yellowish brown (10YR 5/8) and dark reddish brown (5YR 3/4); fine moderate subangular structure; somewhat massive in place.	28.0	26.5	22.4	19.0	15.9	.159
6	32-38	Same as above but changes to heavy silty clay loam.	-	-	-	-	-	.120

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc	Percent	Percent	Percent	Percent	Percent
1	0-4	1.54	1.3	7	27	52	14
2	4-8	-	-	-	-	-	-
3	8-13	1.43	.6	10	25	46	19
4	13-20	1.48	.5	11	24	45	20
5	20-32	1.50	.4	12	21	41	26
6	32-38	-	-	-	-	-	-

Soil Type Wabash silt loam No. 55[1]
Classification: Humic-Gley
Area: Harrison County (Key to map: 47)

Parent Material: Silty alluvium
Relief: Nearly level
Drainage: Poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
1	0-7	Very dark brown (10YR 2/2) silt loam; friable crumb structure; pH 6.4.	28.1	26.6	19.4	13.7	9.3	0.231
2	7-20	Very dark gray brown (10YR 3/2) silt loam; coating on aggregates of light brownish gray (10YR 6/2); fine subangular blocky structure; pH 5.4.	25.7	24.6	19.4	14.3	8.9	.212
3	20-30	Black (10YR 2/1) silty clay loam; massive structure; pH 6.2.	23.9	22.8	21.3	19.3	14.7	.120
4	30-48	Very dark gray (10YR 3/1) silty clay; massive structure; pH 5.6.	27.6	28.0	26.6	24.8	22.2	.083

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
1	0-7	1.34	2.9	12	28	45	15
2	7-20	1.35	1.9	7	32	45	16
3	20-30	1.48	1.1	6	20	44	30
4	30-48	1.44	1.6	4	15	38	43

[1] May be correlated as Huntsville or Colo.

Soil Type: Wabash clay No. 58
Classification: Humic-Gley
Area: Carroll County (Key to map: 48)

Parent Material: Fine textured alluvium
Relief: Nearly level
Drainage: Poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
1	0-5	Black (10YR 2/1) clay; very fine granular structure.	44.2	41.8	40.4	36.5	28.7	0.153
2	5-10	Black (10YR 2/1) firm clay; weak fine granular structure.	-	-	-	-	-	.153
3	10-18	Very dark gray (10YR 3/1) massive clay; mottling of grayish brown (10YR 5/2).	42.2	40.9	38.7	35.4	28.2	.155
4	18-26	Dark gray to gray (5Y 4/1 - 5/1) massive clay; fine mottling of brown (7.5YR 5/2).	-	-	-	-	-	.155
5	26-34	Gray (5Y 5/1) massive firm clay; variegated with gray (2.5Y 5/0); pH 6.0.	43.0	42.7	39.9	36.2	28.4	.175
6	34-40	Dark gray (5Y 4/1) massive plastic silty clay; mottling of olive (5Y 5/4); pH 6.0.	-	-	-	-	-	.175

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
1	0-5	1.17	3.6	5	6	27	62
2	5-10	-	-	-	-	-	-
3	10-18	1.22	2.0	4	6	22	68
4	18-26	-	-	-	-	-	-
5	26-34	1.22	1.7	4	7	21	68
6	34-40	-	-	-	-	-	-

Soil Type: Forestdale fine sandy loam No. 253
Classification: Gray-Brown Podzolic - alluvial intergrade
Area: New Madrid County (Key to map: 49)

Parent Material: Mixed alluvium
Relief: Nearly level
Drainage: Poor

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_p	0-6	Dark gray brown (10YR 4/2) very fine sandy loam; fine to medium weak subangular blocky structure; friable when moist; pH 4.8.	19.9	17.2	11.6	9.2	6.3	0.168
B_{21}	6-12	Very dark gray (10YR 3/1) clay loam; medium moderate subangular blocky structure; firm when moist; pH 4.8.	22.0	20.8	18.3	15.5	13.2	.119
B_{22}	12-22	Dark gray brown (10YR 3/2 - 4/2) fine sandy loam; firm medium moderate subangular blocky structure; pH 4.8 - 5.0; mottlings few distinct and fine to medium; dark yellowish brown (10YR 4/4).	23.1	24.4	19.7	17.4	15.3	.139
B_{23}	22-34	Gray (10YR 4/1 - 5/1) fine sandy clay loam; structure and consistence same as above; pH 4.6.	19.7	19.0	17.1	15.3	12.0	.116

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_p	0-6	1.55	1.4	43	27	21	9
B_{21}	6-12	1.57	1.4	28	22	26	24
B_{22}	12-22	1.53	1.0	38	19	31	12
B_{23}	22-34	1.66	.5	53	14	15	18

Soil Type: Forestdale-like loamy sand No. 253
Classification: Gray-Brown Podzolic - alluvial intergrade
Area: Scott County (Key to map: 50)

Parent Material: Mixed alluvium
Relief: Nearly level
Drainage: Imperfect

Horizon	Depth	Profile description	Water by weight at suctions of--					Available water per inch
			0.1 atm.	0.33 atm.	1.0 atm.	3.0 atm.	15 atm.	
	Inches		Percent	Percent	Percent	Percent	Percent	
A_1	0-7	Very dark gray brown (10YR 3/2) loamy sand; weak crumb to single grain structure; some mottling gray (10YR 6/1) and some pale brown (10YR 6/3).	10.7	9.4	8.4	7.5	5.5	0.069
B	7-20	Gray and brownish gray (10YR 6/1 - 6/2) sand; single grain structure; mottling common, brown (10YR 5/3) and reddish brown (5YR 4/4).	10.3	8.3	6.6	5.9	4.6	.067
C	20-34	Dark gray brown (10YR 4/2) coarse sand; single grain structure.	9.6	6.8	5.3	5.6	4.5	.041
C	34-40+	Dark gray brown (10YR 4/2) coarse sand, some gravel; single grain structure.	7.5	2.7	2.1	2.2	1.6	.018

Horizon	Depth	Bulk density	Organic matter	Mechanical analyses			
				Sand	Coarse silt	Fine silt	Clay
	Inches	Grams/cc.	Percent	Percent	Percent	Percent	Percent
A_1	0-7	1.77	2.1	76	5	11	8
B	7-20	1.81	.5	82	3	6	9
C	20-34	1.76	.5	91	1	2	6
C	34-40+	1.65	.5	96	0	1	3