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# TEXAS AGRICULTURAL EXPERIMENT STATION

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COLLEGE STATION, BRAZOS COUNTY, TEXAS

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DIVISION OF CHEMISTRY

# Chemical Composition Of The Soils Of Cass, Dickens, Falls, Hardeman, Polk, Scurry, And Wheeler Counties

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS

T. O. WALTON, President

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Chemical analyses and some pot experiments are reported for representative samples of typical soils of Cass, Dickens, Falls, Hardeman, Polk, Scurry, and Wheeler Counties. Chemical constituents in the individual soil types are graded in a system based upon the quantity of the constituent found in the soil; the system of grading and its relation to previous methods of interpretation are discussed. Bottom land or alluvial soils are better supplied with plant food than the upland soils of the same county. Many of the soils are deficient in phosphoric acid and nitrogen. Most of the soils are fairly well supplied with potash, although some are low in this constituent. A few are low in lime and may have a tendency to become acid, but most are fairly well supplied with lime, while some are calcareous soils and high in lime.

Pot experiments on most of the soils showed that under favorable conditions in the greenhouse most of the soils responded to the application of fertilizers containing nitrogen and phosphoric acid but that few soils responded to the application of potash.

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# CHEMICAL COMPOSITION OF SOILS OF CASS, DICKENS, FALLS, HARDEMAN, POLK, SCURRY, AND WHEELER COUNTIES

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This bulletin deals with the composition and fertility of samples of soils collected from seven counties of Texas. It is the fifteenth in a series dealing with the chemical composition of Texas soils.

Most of the samples were collected by field agents of the Bureau of Chemistry and Soils of the U. S. Department of Agriculture in cooperation with the Texas Agricultural Experiment Station. Detailed reports of these surveys with maps showing the location of the different soil types have been published by the Bureau of Chemistry and Soils of the U. S. Department of Agriculture. These soils represent the most important soils of the county, but a few that are not extensive or important were not studied. The study included a few soils which were sent in by individuals other than the soil surveyors. These samples usually have low registration numbers. The name of the soil type, as given in later tables, is followed by the word "probably." Descriptions of soils given in this bulletin have been condensed from the earlier survey reports. The soil surveys referred to are as follows:

Soil Survey of Cass County, Texas, by M. W. Beck, Howard William Higbee, and R. M. Marshall.

Soil Survey of Dickens County, Texas, by William T. Carter, B. H. Henderson, and W. W. Strike.

Soil Survey of Falls County, Texas, by M. W. Beck.

Soil Survey of Hardeman County, Texas, by E. H. Templin and T. W. Glassey.

Soil Survey of Polk County, Texas, by H. M. Smith, T. C. Reitch, Harvey Oakes, L. G. Ragsdale, and A. H. Bean.

Soil Survey of Scurry County, Texas, by E. H. Templin and T. C. Reitch.

Soil Survey of Wheeler County, Texas, by A. H. Bean, T. C. Reitch, and E. C. Foster.

Copies of some of these surveys can be purchased from the Superintendent of Public Documents, Washington, D. C.

## Maintenance of fertility

Cropping the soil results in losses of nitrogen, phosphoric acid, potash, and other soil constituents, partly by withdrawal in the crop and partly by losses through water passing through the soil, and by erosion. Unless these losses are restored by means of fertilizers, or soil-renovating crops, the land will decrease in fertility.

The following are some of the essentials to the maintenance or improvement of soil fertility:

1. The store of nitrogen and humus in the soil should be maintained. For this purpose, growing legumes in a proper rotation and turning these under or grazing them off is usually to be advised. The nitrogen in the soil may be supplemented by the use of nitrogenous fertilizers. Losses of nitrogen due to cropping may eventually result in a deficiency of nitrogen.

2. Deficiency of phosphoric acid in the soil should be corrected by the use of phosphates as a fertilizer. Losses of phosphoric acid due to continued cropping will eventually result in a deficiency of phosphoric acid.

3. Any acidity sufficient to be injurious to the crops being grown should be corrected by applications of ground limestone or lime. Lime and limestone are also used for the improvement of the physical character of heavy soils poor in lime or for supplying lime to crops which need a quantity of lime. Lime should be used chiefly in connection with a systematic legume rotation.

4. Any deficiency of potash in the soil should be corrected by the use of fertilizers containing potash. Losses of potash due to continued cropping may eventually result in a deficiency of potash.

5. Erosion or washing away of the more fertile surface soil should be prevented.

6. Land under irrigation should have good underdrainage, either natural or artificial, so that salts dissolved in the irrigation water will be washed out and will not accumulate in the soil.

**Humus.** The maintenance of the humus content of the soil aids materially in maintenance of fertility. Humus is produced by the partial decay of vegetable matter in the soil. Humus, in sufficient quantity, helps soils to hold a favorable amount of water, so as better to resist drouth. It aids to give a fine, crumbly structure to clay soils and enables them to break up into a good condition of tilth under the action of cultivating implements. It checks the rapidity of the percolation of water through sandy soils, thus decreasing loss of plant food. Humus also is the storehouse of most of the nitrogen of the soil. Nitrogen in humus is in an insoluble form and cannot be taken up by crops or washed out of the soil. Nitrogen in humus is slowly changed by soil organisms to nitrates or to ammonia, in which forms the nitrogen may be taken up by plants or washed from the soil. The storing of nitrogen in the insoluble humus compounds protects the soil from rapid depletion of nitrogen, either by cropping or by percolating water. Some soils produce good crops for a long time without additions of vegetable matter, but for permanent productiveness on most soils, vegetable matter must be added sooner or later. Vegetable matter may be supplied in barnyard manure, which is excellent when sufficient quantities can be secured; but barnyard manure cannot always be secured in large enough quantities. Artificial manure may be prepared from leaves, straw, or similar waste material. Legume crops, which have power to take nitrogen from the air, may be grown in rotation with other crops, and if either turned under or grazed off will introduce vegetable matter into the soil. If the crop is heavy, it is best to allow it to become nearly mature before turning it under. To graze off the crop is better than to turn it under, as some of the feeding value of the crop is secured when it is grazed at the same time that the droppings from the animals, together with the liquid excrement, return to the soil the bulk of the plant food taken up by the crop. To make the crop into hay and save the manure from the hay is not as good for the soil as grazing off the crop, since a large part of the plant food in the hay is lost in the liquid excrement or that part of the solid excrement which cannot be saved. When the legume is made into hay to be sold, the land is more likely to lose nitrogen than to gain it; it also loses phosphoric acid and potash. Crops other than legumes add vegetable matter to the soil when plowed under or grazed off, or they serve as cover crops to reduce losses from leaching or from washing when the land would otherwise be bare; but legumes are the only plants which can take up the nitrogen of the air and place it into the soil in forms suitable for the use of other crops. For this reason it is best to grow legumes for hay, forage, or renovating crops whenever possible.

**Nitrogen.** The maintenance of the nitrogen content of the soil is more important than the maintenance of its humus content. Nitrogen may be purchased as a fertilizer, but it is expensive when bought in this way, and ordinarily a farmer growing staple crops cannot afford to buy enough of it to keep the nitrogen content of his land from decreasing. The most practical way to maintain the nitrogen content of the soil when ordinary farm crops are grown is to secure part of the nitrogen from the air by growing legumes. The nitrogen fixed by legumes can then be utilized for cotton, corn, kafir, or similar crops. The kind of legume best to grow depends upon the climate and other conditions, which vary with different sections of the State and with different conditions of farming.

**Phosphoric acid.** Texas soils are frequently deficient in phosphoric acid. This bulletin contains information regarding the probable deficiencies in phosphoric acid of the various soils of the counties described. Deficiency of phosphoric acid may be easily and profitably corrected by the use of superphosphate as a fertilizer.

**Potash.** While the soils of Texas are frequently rich in potash, there is a variation between the different soils and some soils may need potash as a fertilizer. In general, potash is the least often needed of the three plant foods for field crops. Plants can take up more potash than they need. The needs for potash of the various types of soils here studied are indicated by the tables of analyses and grades of constituents given later. Some of the soils described, when compared with other soils of the State, are low in active potash, although they are much better supplied with potash than with phosphoric acid or nitrogen.

**Acidity.** Some soils contain organic or inorganic acids. Some crops—clover, alfalfa, barley, and rye, for example—do not grow well on acid soils. There are other crops, such as cowpeas and watermelons, which do well on acid soils. Legumes require more lime than other crops. Acidity may be corrected by the use of ground limestone, ground oyster shells, air-slaked lime, or hydrated lime. Few acid soils are found to occur in the counties described in this bulletin.

### How to use the analyses

Analyses of the soils are given with the descriptions of the various types of soil in connection with each county. The classifications of these analyses are also given, in order to show the comparative strength or weakness of each type. The analyses are made chiefly on soils which are not under cultivation; soils which have been cropped are usually poorer than those here described.

If a soil well supplied with plant food does not give good yields, it is obvious that some condition other than plant food controls the yields. The condition which limits the yield may be a poor physical condition, either with respect to cultivation, drainage, or other factors. It may also be the presence of injurious substances, such as soluble salts. The soil may supply insufficient amounts of water for good growth of the plants; or, on the other hand, it may be too wet. Plant diseases may also be present.

If the soil is well supplied with total plant food, but low in active food, attempts may be made to increase the activity of soil agencies which make the plant food available. These may be additions of manure, of green crops plowed under, or, if the soil needs lime, additions of lime or ground limestone in connection with a legume rotation. This kind of cropping of course leads eventually to depletion of the total plant food in the soil.

If the crop yields are low and the plant food is deficient, fertilizer should be used. It is not possible to tell from the appearance or the analysis of the soil the formula of the fertilizer which will give the best results. The depth of the soil, the character of the subsoil, and the kind of weather during the growing season influence the yield of crops as much as the plant food. That great variations are caused by the kind of season can be seen by observing the variation of the yields on the same land from one year to another.

### Explanation of Terms

**Total nitrogen** is the entire quantity of nitrogen present in the soil. Most of the nitrogen is present in organic matter or humus. As shown in Bulletin 151, there is a relation between the total nitrogen of the soil and the nitrogen which can be taken from it by crops in pot experiments. The total nitrogen is therefore an index to the needs of the soil for nitrogen, although the nitrogen in worn soils is not as available as that in new soils, and a number of conditions affect the quantity of nitrogen available for the use of crops.

**Total phosphoric acid** is the entire quantity of phosphoric acid contained in the soil. It cannot all be taken up by plants at once, as only a small portion is immediately available. It is made available slowly by natural agencies.

**Active phosphoric acid** is that soluble in 0.2 N nitric acid and is the part of the total phosphoric acid which is more easily taken up by plants. The relation of the active phosphoric acid to the fertility of the soil is shown in the table giving the classes of the constituents. As shown in Bulletins 126 and 276, there is a relation between the active phosphoric acid of the soil and the amount of phosphoric acid which crops are able to take from the soil in pot experiments. There is a closer relation between the active phosphoric acid of the soil and the needs of the soil for phosphoric acid as a fertilizer than there is between total phosphoric acid and the needs of the soil. Pot experiments have shown (Bulletin 267) that plants grown on soils low in active phosphoric acid and high in lime can remove more phosphoric acid from the soil than they can from soils containing the same quantities of active phosphoric acid and low amounts of lime.

**Total potash** represents the entire amount of potash in the soil. A large part of this is locked up in highly insoluble silicates and may not become available for the use of plants in centuries. The amount of total potash does not indicate how much is available for use by the immediate crop.

**Acid-soluble potash** is the amount of potash which is dissolved by strong hydrochloric acid. As pointed out by Hilgard, there is a relation between the amount of acid-soluble potash in the soil and the wearing qualities of the soil (Fraps, **Principles of Agricultural Chemistry,** page 171). The higher the percentage of acid-soluble potash, the longer the soil can be cropped before it needs potash.

**Active potash** is that soluble in 0.2 N nitric acid and is the part of the total potash which can be readily taken up by plants. This has been shown by pot experiments discussed in Bulletins 145 and 325. There is a close relation between the amount of active potash in the soil and the amount which is available for the growth of crops.

**Acid-soluble lime** is the lime which is dissolved by strong hydrochloric acid. According to Hilgard, the amount of lime found by this method is a valuable indication as to the fertility of the soil.

**Basicity** represents the carbonate of lime and other basic materials in the soil. This term is here applied to the bases (chiefly lime) which neutralize 0.2 N nitric acid in the method for determining active phosphoric acid and active potash. When the basicity is over 8 per cent, stronger acid is used. The term basicity is merely used as a convenient one for the determination referred to. The basicity represents all of the carbonate of lime and, in addition, about 86 per cent of the exchangeable bases of the soil (Bulletin 442).

**Acidity** is here represented by what is termed the pH (or hydrogen ion concentration) which shows the intensity of acidity. A neutral soil is represented by a pH value of 7.0. The lower the number below 7, the more acid the soil. A soil of pH 6.0 is ten times more acid than a soil of 7.0, and one with 5.0 pH is ten times more acid than one of pH 6.0. Numbers higher than 7.0 indicate alkalinity and the higher the number, the more alkaline the soil. In general, a certain reaction is best suited to a given kind of plant. If acid, applications of lime should be made to produce the favorable pH. However, soils do not all act alike in this respect, and sometimes acid soils do not respond to the addition of lime. Excessive additions of lime cause injury to many soils.

**Corn possibility** represents the average amount of plant food which is withdrawn by plants in pot experiments from soils containing similar amounts of total nitrogen, active phosphoric acid, and active potash. It is expressed in bushels of corn per acre. It is based on 2,000,000 pounds of the soil.

The corn possibility is not claimed to indicate the possible yield from the soil, as this depends upon other conditions in addition to the fertility of the soil. The corn possibility is a convenient way of comparing amounts of various plant foods in the soil. For example, with the Hollister clay of Hardeman County (No. 37288, Table 15) the corn possibility for total nitrogen is 27 bushels, for phosphoric acid 30, and for potash 553. The soil is probably deficient in both phosphoric acid and nitrogen. This may be compared with the Abilene clay loam of Hardeman County (No. 37284, Table 15), which has a corn possibility of 76 bushels for nitrogen, 47 for phosphoric acid, and 813 for potash. Other comparisons can be made from the tables.

The experiments on which this interpretation is based are published in Bulletins 126, 145, 151, 267, and 355; and the method is discussed in Bulletins 213 and 355.

## Grading of Constituents of Soils

In previous bulletins dealing with the composition of Texas soil, tables are given which show the interpretation of the analyses. In Bulletins 533 and 549 and in this bulletin the soils are grouped into five grades. Grade 1 is given to those which contain the highest quantities and Grade 5 to those which contain the lowest, while the others are intermediate. This grading is intended to give an easy way to compare the composition of different soils and to observe their relative strengths and weaknesses. In choosing the limits of composition to be used for each grade, we have endeavored to use regular gradations and to arrange the gradations in such a way as to have the greatest possible meaning with respect to the information at present available. We have taken into consideration the pot experiments and their relation to the composition of the soil (Texas Bulletins 126, 145, 151, 213, 267, and 355), and have also considered the field experiments which were available. The soils placed in Grade 5 active phosphoric acid are very likely to be deficient in phosphoric acid for the growth of crops. The same applies to active potash and to nitrogen. The relations are not so evident with the acid-soluble potash, the total phosphoric acid, and the total potash; but Grade 5 contains the lowest percentages of these constituents, and the soils with this grade are the weakest in these respects. Soils whose acid-soluble lime is placed in Grade 5 are quite low in lime and there is a possibility of a deficiency of lime. Soils whose pH is placed in Grade 5 are decidedly acid.

The constituents placed in Grade 4 are present in larger quantities than those in soils classed in Grade 5. In the cases of total nitrogen, active phosphoric acid, and active potash, the soils containing quantities of the constituents falling in Grades 5 and 4 are likely to respond to applications of fertilizer, provided that rainfall and other conditions are favorable to the growth of crops. Soils with the pH in Grade 4 are acid but are less acid than those in Grade 5. Soils in Grade 3 with respect to active phosphoric acid and active potash may respond to applications of these fertilizers when truck crops are grown but may not respond sufficiently to be economically practicable when field crops are grown. Response to nitrogen may occur with soils whose nitrogen is placed in Grade 3. There is less probability of response to fertilizers with Grades 1 and 2, since these grades include soils with the highest quantities of the constituents. These are the strongest soils.

The lime in the three lower grades is probably all contained in the exchange complex of soils with low exchange capacities. The maximum lime in Grade 3 is equivalent to 14.3 milliequivalents per 100 grams. Lime in Grade 2 may be present as exchangeable lime in soils with higher total exchange capacity or there may be small amounts of limestone or soluble neutral calcium salts in such soils. Soils in Grade 1 all contain some limestone.

The basicity of Grades 5, 4, and 3 is sufficiently low to preclude the possibility of the presence of much limestone in the soil. Grade 5 contains soils with basicity so low that there is danger of making the soils too acid for satisfactory plant growth when acid-forming nitrogenous fertilizers are used for a number of years, while Grade 4 contains many soils which may be injured in this way. Basicity in Grade 3 may still be entirely due to the exchange complex in the soil; the maximum basicity equivalent to 2.00% of calcium carbonate is also equivalent to 40 milliequivalents. Soils in Grades both 1 and 2 contain limestone. Grades for reaction (pH) are based on ranges of pH for satisfactory plant growth. Grade 1 (7.51+) is definitely alkaline; Grade 2 is so nearly neutral that good growth of most crops is not inhibited; Grade 5 contains soils which are so acid that many crops, particularly legumes, will not grow well; Grades 3 and 4 contain soils which may be sufficiently acid to damage growth of certain crops.

The limits of grades of constituents and the relation of the different grades to the interpretations used in previous bulletins are given in Table 1.

**Table 1. Limits and interpretations of grades of constituents of soils**

| Grade number | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| Nitrogen | | | | | |
| Limits—per cent | 0—.030 | .031—.060 | .061—.120 | .121—.180 | .181+ |
| Maximum corn possibility | 10 | 18 | 33 | 48 | 49+ |
| Maximum number of 40 bu. corn crops | 10 | 20 | 40 | 60 | 61+ |
| Total phosphoric acid | | | | | |
| Limits—per cent | 0—.025 | .026—.050 | .051—.100 | .101—.150 | .151+ |
| Intrepretation | Low | Low to fair | Fair to good | Good | High |
| Maximum number of 40 bu. corn crops | 20 | 40 | 80 | 120 | 121+ |
| Active phosphoric acid | | | | | |
| Limits—p.p.m. | 0—30 | 31—100 | 101—200 | 201—400 | 401+ |
| Maximum corn possibility | 18 | 40 | 45 | 50 | 51+ |
| Total potash | | | | | |
| Limits—per cent | 0—.30 | .31—.60 | .61—1.21 | 1.21—1.80 | 1.81+ |
| Acid-soluble potash | | | | | |
| Limits—per cent | 0—.10 | .11—.20 | .21—.40 | .41—.80 | .81+ |
| Interpretation | Low | Low to fair | Fair to good | Good | High |
| Maximum number of 40 bu. corn crops | 50 | 100 | 200 | 400 | 401+ |
| Active potash | | | | | |
| Limits—p.p.m. | 0—50 | 51—100 | 101—200 | 201—400 | 401+ |
| Maximum corn possibility | 26 | 50 | 94 | 171 | 172+ |
| Lime | | | | | |
| Limits—per cent | 0—.10 | .11—.20 | .21—.40 | .41—2.00 | 2.01+ |
| Interpretation | Low | Low to fair | Fair to good | Good | High |
| Basicity | | | | | |
| Limits—per cent | 0—.30 | .31—.60 | .61—2.00 | 2.01—5.00 | 5.01+ |
| pH | | | | | |
| Limits | 0—5.0 | 5.1—5.5 | 5.6—6.0 | 6.1—7.5 | 7.6+ |
| Acidity | Very acid | Acid | Slightly acid | Practically neutral | Alkaline |

The classification is not intended to give a grouping which can be interpreted in terms of crop yields or possible fertilizer responses, since these are determined by many factors in addition to chemical composition, upon which the classification is based. However, certain general relationships may be noted. Soils in Grade 1 are probably not deficient with respect to the element concerned, except possibly where unusually heavy demands are made on the soil such as in the growth of very large truck crops. Most soils in Grade 5 and many in Grade 4 are low in fertility with respect to the element concerned. Some soils in Grade 3 and a few in Grade 2 may be deficient when heavy crops are grown. It must be remembered, in this connection, that a soil may be high in total quantity of an element and still be deficient in the quantity which is readily available to plants. The available supply, rather than the total supply, is the determining factor in crop growth and fertilizer response, insofar as chemical composition is concerned. It must also be stated that cropping and erosion will reduce the plant food content of the soil, so that in the course of time the grades will change, usually to become lower.

## Saline soils

Saline soils are soils modified by the presence of soluble salts, chiefly sodium chloride or sodium sulphate. Soluble salts occur in sufficient quantity to be injurious to crops in some of the soils of the counties here discussed. Salty spots are of frequent occurrence along the Gulf Coast, and also in other parts of Texas.

Saline soils may originate in several different ways, of which the principal are sub-irrigation, either natural or artificial, surface irrigation combined with insufficient drainage, and irrigation with water high in sodium salts.

**Sub-irrigation.** If the ground water is high in soluble salts and sufficiently close to the surface to be evaporated into the air, the water will constantly rise, carrying soluble salts with it. When the water evaporates, the salts are left behind. If the rainfall is not sufficient, or for any reason does not pass through the soil and wash the salts out, the salts will accumulate. The amount accumulated will depend upon the amount in the water as well as on other conditions, but comparatively small amounts in the water may, in the course of years, give rise to large amounts of salts in the soil.

**Irrigation combined with insufficient drainage.** Irrigation water naturally contains some soluble salts. When the water evaporates, the salts are left behind. Unless they are washed out down through the subsoil, into the country drainage, they will accumulate, and in the course of time will injure the crops. Irrigation should be accompanied by subsoil drainage, if it is not naturally present, and by the use of sufficient applications of water from time to time, to wash out the salts and thereby prevent their accumulation.

**Reaction of salts in irrigation water with soil.** If the irrigation water contains a large proportion of sodium salts and only a small proportion of calcium salts, the salt will act upon the base exchange complex in the soil so as to replace a large proportion of the calcium with sodium. The sodium exchange complex puddles the soil and renders it difficult for water and air to pass into it. It therefore becomes hard when dry, and difficult to cultivate. If the process goes to a certain extent, the soil may become hard and compact, with little or no plant growth upon it. To irrigate such a soil is difficult, as water does not penetrate it readily.

The remedy for such a condition is the addition of soluble calcium salts. The calcium salt acts upon the sodium base exchange complex in such a way that the calcium takes the place of the sodium. The formation of the calcium base complex makes the soil more pervious to water and air, so that the sodium salt formed in the process can be washed out. Calcium sulphate may be used. Or, if the soil contains sufficient amounts of calcium carbonate, sulphur may be used. The sulphur is oxidized by the bacteria in the soil to sulphuric acid. The sulphuric acid may act directly upon the sodium base exchange complex, which is replaced with hydrogen, and the hydrogen, in turn, is replaced with calcium from the calcium carbonate. The sulphuric acid will also partly act upon the calcium carbonate, producing calcium sulphate, which exchanges its calcium for the sodium in the base exchange complex.

Saline soils are frequently called Alkali soils. The injurious salts are not alkaline as a rule, usually consisting of sodium chloride (common salt) and sodium sulphate. The soils are alkaline when sodium carbonate or bicarbonate are present, in which case they are called black alkali soils. Soils in Texas sometimes, but not frequently, contain black alkali. The composition of the salts in some of the saline soils is given in connection with the discussion of soils of some of the counties.

## Pot experiments

The needs for plant food of some of the soils discussed in this bulletin were studied by growing plants in pots containing samples of the soils, to which various forms of plant food were added. In making these experiments, 5,000 grams of soil were placed in galvanized iron pots, and to one or more pots a complete fertilizer was added. To one or more pots nitrogen and potash were added, phosphoric acid being omitted. The difference between this pot and the pot with the complete fertilizer shows the need of the soil for phosphoric acid. To one or more pots, phosphoric acid and potash were added, nitrogen being omitted. The difference between this pot and that with the complete fertilizer shows the need of the soil for nitrogen. To a third set of one or more pots, nitrogen and phosphoric acid were added, potash being omitted. The difference between this pot and the pot receiving the complete fertilizer shows the need for potash.

The tables show the weights of the crops secured with the different additions; they also show the amounts (expressed in their equivalent of bushels of corn per acre) of phosphoric acid, potash, and nitrogen removed from the pots by the plants grown in the experiments.

The soil in pot experiments is under favorable conditions and it is possible for the plants to make a greater growth or to take up more plant food from the same quantity of soil than would be the case under field conditions. There might be a considerable difference in production between the crop receiving the complete fertilizer and the crop which had no potash, and yet the crop produced without potash in the field might be equal to the possibility of production under the climatic conditions prevailing. In such case the soil would appear deficient in the pot experiment, while for all practical purposes it would not be deficient in the field. This is the reason why the plant food withdrawn is expressed in bushels of corn to the acre. It shows the relative capacity of the soil to furnish plant food to crops in pot experiments.

## Relation of chemical analysis to production

Chemical analysis is made on samples of soil taken from the fields. The analysis for plant food represents the capacity of the soil to furnish it. The capacity of the soil to furnish plant food is only one of a group of factors which control production.

The chemical analysis is related to the capacity of the soil to supply plant food; but when the results are applied to field work, other important factors enter into play. The most important of these are perhaps (a) the kind of crop and its ability to assimilate plant food, (b) the depth of the soil and the extent to which it is occupied by roots, (c) the water provided by soil and season, (d) the temperature, and (e) the highest quantity of crop which can be produced under these and other prevailing soil and climatic conditions. It is obvious that a plant having twice the capacity of another to assimilate phosphoric acid will need only half the quantity to be in the soil in order to produce an equivalent yield; that a soil furnishing enough phosphoric acid for 30 bushels of corn may not contain enough for 50 bushels; that soil which can be occupied by roots to a depth of 6 inches furnishes only half as much plant food as one that is occupied to a depth of 12 inches; and that soil may contain enough plant food for 30 bushels of corn and yet not enough for a large crop of tomatoes. These are all illustrations of the factors mentioned above, which affect the ability of the plant to use the food offered it by the soil.

The grades given in this bulletin refer entirely to the quantity of the various elements in the soil. No attempt is made to allow for any of the other factors which may affect production.

## Average composition of the soils of the counties studied

The average composition of a number of soil types was calculated from the analyses of two or more samples of the same soil type. Figures widely out of agreement with figures for the same constituent in other samples of the same soil type were omitted from the averages. For example, two samples of Kirvin fine sandy loam in Cass County (Nos. 7112 and 7167) contained much more active phosphoric acid than the Kirvin fine sandy loam usually does (see other samples in Cass County and general average in Bulletin 549). These figures for active phosphoric acid were therefore omitted from the average. Several other similar cases occur in the tables. Whenever a figure has thus been omitted from the average, it is enclosed in parentheses.

In calculating the averages given in the succeeding tables, the surface soil is considered to be that portion of the soil profile from 0 to about 7″, the subsoil from 7″ to about 20″, and the deep subsoil the part of the profile lying next below that depth. In a number of cases, the soil surveyor who collected the soil samples in the field took separate samples from depths of the profile which do not correspond to these approximate depths. For example, samples of an Abilene loamy fine sand from Wheeler

County (Nos. 36405 through 36409, Table 22), were taken at depths of 0 to 1", 1" to 6", 6" to 7", 7" to 18", and 18" to 19". In calculating the averages for all of the profiles of Abilene loamy fine sand, the 3 samples in the 0 to 7" depth were first averaged and the averages thus secured were used as representing a single sample of the surface soil of that type. The same procedure was followed with the 2 samples in the 7" to 19" depth of the subsoil. Only the upper samples of the deep subsoil were used in calculating the averages for the deep subsoil. Many other similar cases occur throughout the tables. Cases in which this preliminary averaging was done are shown in the tables by the description of the sample immediately following the soil type name in the tables giving the analyses of the soils.

The average figure given for a single constituent in any soil group was calculated from all of the soils in which that constituent was estimated. In several cases, the analyses given for a particular sample are incomplete, not all of the constituents having been estimated in that sample. In nearly all such cases, the analyses omitted were for the acid-soluble potash, lime, and magnesia. In averaging for these constituents, it was therefore impossible to average as many samples as for the remaining constituents.

For the purpose of discussion, the soils were divided into upland and bottom land soils; then the upland soils were subdivided either into geographical regions (when more than one region occurred in a single county) or into calcareous and noncalcareous groups. The average composition of these groups is given in Table 2; the grading of the constituents of the surface and subsoils is given in Table 3.

The upland soils of the Blackland Prairie and the counties in the western part of the State were better supplied with plant food than the upland soils of the East Texas Timber Country. For example, the nitrogen in the East Texas Timber Country soils with friable subsoils in Falls County averaged .043% (Grade 4), while that in the calcareous soils of the Blackland Prairie section of the same county averaged .116% (Grade 3), and the calcareous soils of Wheeler County averaged .144% (Grade 2). The calcareous upland soils were better supplied with plant food than the noncalcareous upland soils of the same county. Soils with dense subsoils in Polk County contained slightly more plant food than the soils with friable subsoils in the same county. The quantities of nitrogen in the different upland soil groups varied widely; the better soils mentioned above contained much more nitrogen than the poorer soils. Active phosphoric acid in most of the soils was low, particularly in the soils of Cass County. Active potash varied from medium to high; the group of soils in Polk County with friable subsoils (Grade 4) was the only upland surface soil group whose grade for active potash was below 3. Lime and basicity varied from high to medium in most soils, but the friable subsoil group of the East Texas Timber Country was considerably below the other soil groups in these constituents. None of the soils were more than slightly acid.

| Soil group | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH |
|---|---|---|---|---|---|---|---|---|---|---|
| Upland surface soils | | | | | | | | | | |
| Cass County, friable subsoils | .043 | .036 | 15 | .37 | .11 | 119 | .13 | .09 | .08 | 5.6 |
| Dickens County, calcareous | .109 | .099 | 286 | 2.84 | .68 | 391 | 2.94 | 4.38 | 1.15 | 7.4 |
| Dickens County, noncalcareous | .086 | .054 | 93 | 1.70 | .36 | 280 | .51 | 1.12 | .46 | 7.0 |
| Falls County, Blackland Prairies, calcareous | .116 | .101 | 55 | 1.01 | .45 | 222 | 15.18 | 24.21 | .78 | 8.0 |
| Falls County, Blackland Prairies, noncalcareous | .072 | .031 | 28 | .87 | .21 | 151 | .62 | .86 | .29 | 7.3 |
| Falls County, East Texas Timber Country | .043 | .022 | 21 | .88 | .10 | 108 | .17 | .22 | .12 | 7.2 |
| Hardeman County, calcareous | .095 | .074 | 256 | 2.12 | 1.27 | 288 | 5.27 | 6.07 | 1.71 | 8.3 |
| Hardeman County, noncalcareous | .080 | .068 | 167 | 1.76 | .62 | 441 | .92 | 1.38 | .60 | 7.4 |
| Polk County, friable subsoils | .059 | .025 | 33 | .27 | .07 | 100 | .15 | .34 | .08 | 6.7 |
| Polk County, dense subsoils | .061 | .032 | 17 | .63 | .13 | 129 | .29 | .58 | .21 | 5.4 |
| Polk County, Blackland Prairies | .127 | .031 | 16 | .56 | .26 | 163 | 1.02 | 1.52 | .46 | 6.1 |
| Scurry County, calcareous | .117 | .065 | 94 | 1.72 | .69 | 251 | 7.17 | 8.78 | .84 | 8.2 |
| Scurry County, noncalcareous | .098 | .048 | 78 | 1.60 | .49 | 440 | 1.15 | 1.73 | .46 | 7.7 |
| Wheeler County, calcareous | .144 | .084 | 234 | 2.31 | .43 | 308 | 4.40 | 8.27 | .71 | 8.2 |
| Wheeler County, noncalcareous | .079 | .041 | 103 | 2.08 | .23 | 248 | .60 | 1.02 | .34 | 7.4 |
| Alluvial surface souls | | | | | | | | | | |
| Cass County | .048 | .042 | 97 | ........ | .07 | 94 | .28 | .15 | .08 | 6.4 |
| Dickens County | .107 | .077 | 261 | 1.64 | .47 | 403 | 2.81 | 3.30 | .68 | 7.4 |
| Falls County | .137 | .136 | 227 | 2.09 | .93 | 508 | 5.64 | 11.85 | 2.48 | 7.9 |
| Polk County | .130 | .057 | 101 | 1.02 | .27 | 185 | .50 | .77 | .27 | 5.7 |
| Scurry County | .091 | .098 | 516 | 1.78 | .58 | 628 | 2.60 | 4.80 | .61 | 8.4 |
| Upland subsoils | | | | | | | | | | |
| Cass County, friable subsoils | .034 | .031 | 16 | .42 | .16 | 122 | .17 | .10 | .13 | 5.4 |
| Dickens County, calcareous | .076 | .097 | 286 | 3.00 | .67 | 194 | 5.62 | 8.53 | 1.53 | 7.6 |
| Dickens County, noncalcareous | .061 | .047 | 75 | 1.80 | .54 | 241 | .46 | .91 | .60 | 7.1 |
| Falls County, Blackland Prairies, calcareous | .079 | .093 | 38 | 1.11 | .39 | 131 | 19.38 | 27.73 | .82 | 7.9 |
| Falls County, Blackland Prairies, noncalcareous | .046 | .027 | 29 | .96 | .32 | 130 | .80 | 1.28 | .46 | 7.0 |
| Falls County, East Texas Timber Country | .034 | .022 | 7 | .96 | .24 | 144 | .19 | .35 | .23 | 6.3 |
| Hardeman County, calcareous | .084 | .082 | 206 | 2.05 | 1.40 | 104 | 10.04 | 11.46 | 2.33 | 8.4 |
| Haredman County, noncalcareous | .062 | .063 | 135 | 1.76 | .66 | 314 | 1.88 | 1.97 | .64 | 7.6 |
| Polk County, friable subsoils | .026 | .018 | 8 | .29 | .07 | 76 | .10 | .19 | .08 | 6.6 |
| Polk County, dense subsoils | .038 | .021 | 9 | .64 | .12 | 98 | .21 | .39 | .21 | 5.2 |
| Polk County, Blackland Prairies | .080 | .023 | 10 | .52 | .31 | 142 | 1.44 | 2.46 | .53 | 5.7 |
| Scurry County, calcareous | .072 | .065 | 96 | 1.79 | 1.28 | 147 | 10.14 | 13.91 | 1.09 | 8.2 |
| Scurry County, noncalcareous | .077 | .044 | 51 | 1.57 | .52 | 356 | 2.03 | 3.20 | .49 | 7.7 |
| Wheeler County, calcareous | .115 | .084 | 43 | 1.90 | .43 | 48 | 13.85 | 26.90 | 1.27 | 8.0 |
| Wheeler County, noncalcareous | .061 | .039 | 72 | 2.12 | .27 | 177 | .84 | 1.32 | .39 | 7.4 |
| Alluvial subsoils | | | | | | | | | | |
| Cass County | .024 | .041 | 43 | ........ | .45 | 81 | .38 | .10 | .06 | 6.3 |
| Dickens County | .062 | .067 | 125 | 1.91 | .50 | 194 | 4.90 | 6.50 | .77 | 7.5 |
| Falls County | .100 | .119 | 180 | 2.20 | 1.07 | 336 | 5.29 | 11.44 | 1.95 | 8.0 |
| Polk County | .070 | .038 | 29 | 1.02 | .25 | 31 | .48 | .79 | .36 | 5.4 |
| Scurry County | .067 | .078 | 402 | 1.94 | .61 | 266 | 4.55 | 7.95 | ....... | 8.2 |

**Table 3. Grades of constituents of soils by groups**

| Soil group | Nitrogen | Total Phos. Acid | Active Phos. Acid | Total Potash | Acid-Soluble Potash | Active Potash | Acid-Soluble Lime | Basicity | Acid-Soluble Magnesia | pH |
|---|---|---|---|---|---|---|---|---|---|---|
| Upland surface soils | | | | | | | | | | |
| Cass County, friable subsoils | 4 | 4 | 5 | 4 | 4 | 3 | 4 | 5 | 4 | 3 |
| Dickens County, calcareous | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 |
| Dickens County, noncalcareous | 3 | 3 | 4 | 2 | 3 | 2 | 2 | 3 | 2 | 2 |
| Falls County, Blackland Prairies, calcareous | 3 | 2 | 4 | 3 | 2 | 2 | 1 | 1 | 1 | 1 |
| Falls County, Blackland Prairies, noncalcareous | 3 | 4 | 5 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |
| Falls County, East Texas Timber Country | 4 | 5 | 5 | 3 | 5 | 3 | 4 | 5 | 4 | 2 |
| Hardeman County, calcareous | 3 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| Hardeman County, noncalcareous | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 2 | 2 |
| Polk County, friable subsoils | 4 | 5 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 2 |
| Polk County, dense subsoils | 3 | 4 | 5 | 3 | 4 | 3 | 3 | 4 | 3 | 4 |
| Polk County, Blackland Prairies | 2 | 4 | 5 | 4 | 3 | 3 | 2 | 3 | 2 | 2 |
| Scurry County, calcareous | 3 | 3 | 4 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| Scurry County, noncalcareous | 3 | 4 | 4 | 2 | 2 | 1 | 2 | 3 | 2 | 1 |
| Wheeler County, calcareous | 2 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1 |
| Wheeler County, noncalcareous | 3 | 4 | 3 | 1 | 3 | 2 | 2 | 3 | 2 | 2 |
| Alluvial surface soils | | | | | | | | | | |
| Cass County | 4 | 4 | 4 | ........ | 5 | 4 | 3 | 5 | 4 | 2 |
| Dickens County | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 |
| Falls County | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Polk County | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| Scurry County | 3 | 3 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| Upland subsoils | | | | | | | | | | |
| Cass County, friable subsoils | 4 | 4 | 5 | 4 | 4 | 3 | 4 | 5 | 4 | 4 |
| Dickens County, calcareous | 3 | 3 | 2 | 1 | 2 | 3 | 1 | 1 | 1 | 1 |
| Dickens County, noncalcareous | 3 | 4 | 4 | 2 | 2 | 2 | 2 | 3 | 2 | 2 |
| Falls County, Blackland Prairies, calcareous | 3 | 3 | 4 | 3 | 3 | 3 | 1 | 1 | 1 | 1 |
| Falls County, Blackland Prairies, noncalcareous | 4 | 4 | 5 | 3 | 3 | 3 | 2 | 3 | 2 | 2 |
| Falls County, East Texas Timber Country | 4 | 5 | 5 | 3 | 3 | 3 | 4 | 4 | 3 | 2 |
| Hardeman County, calcareous | 3 | 3 | 2 | 1 | 1 | 3 | 1 | 1 | 1 | 1 |
| Hardeman County, noncalcareous | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 1 | 1 |
| Polk County, friable subsoils | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 4 | 2 |
| Polk County, dense subsoils | 4 | 5 | 5 | 3 | 4 | 4 | 3 | 4 | 3 | 4 |
| Polk County, Blackland Prairies | 3 | 5 | 5 | 4 | 3 | 3 | 2 | 2 | 2 | 3 |
| Scurry County, calcareous | 3 | 3 | 4 | 2 | 1 | 3 | 1 | 1 | 1 | 1 |
| Scurry County, noncalcareous | 3 | 4 | 4 | 2 | 2 | 2 | 1 | 2 | 2 | 1 |
| Wheeler County, calcareous | 3 | 3 | 4 | 1 | 2 | 5 | 1 | 1 | 1 | 1 |
| Wheeler County, noncalcareous | 3 | 4 | 4 | 1 | 3 | 3 | 2 | 3 | 2 | 2 |
| Alluvial subsoils | | | | | | | | | | |
| Cass County | 5 | 4 | 4 | ........ | 2 | 4 | 3 | 5 | 5 | 2 |
| Dickens County | 3 | 3 | 3 | 1 | 2 | 3 | 1 | 1 | 1 | 2 |
| Falls County | 3 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| Polk County | 3 | 4 | 5 | 3 | 3 | 3 | 2 | 3 | 2 | 4 |
| Scurry County | 3 | 3 | 1 | 1 | 2 | 2 | 1 | 1 | ........ | 1 |

The alluvial soils, or those on flat stream bottoms subject to overflow, were better supplied with plant food than upland soils in the same county. The alluvial soils of the friable subsoil group of the East Texas Timber Country in Cass County were lower than any other alluvial soil group, particularly with respect to active phosphoric acid and basicity.

## Fertilizers for the soils studied

The soils studied may be divided into several groups with respect to their relation to fertilizers.

In the upland soils group, the soils of the East Texas Timber Country vary from slightly deficient to decidedly low in nitrogen. With the exception of the soils of Wheeler and Hardeman County and the calcareous soil group of Dickens County, the soils are deficient to decidedly low in active phosphoric acid and only slightly better in total phosphoric acid. The exceptions are all located in the western part of the State, where water rather than soil fertility is the limiting element in crop production. Very few of the soils are deficient in potash.

The use of fertilizers is generally advisable for field crops on the soils in the eastern part of the State, and especially so for truck and fruit crops. Fertilizers suggested for use with different crops are given in other publications of the Experiment Station. In general, sandy soils are likely to need more potash than the soils of heavier texture. Some calcareous soils do not respond well to fertilizers, although others do, and at present we cannot recommend fertilizers to be used on all calcareous soils. Climatic conditions may interfere with the profitable use of fertilizers in the western part of the State not under irrigation. Fertilizers are not recommended for these soils in the absence of favorable field experiments.

In general, alluvial soils probably do not need fertilizers at present, although field trials on some areas, particularly in Cass and Polk counties, may show good response to their use. When the soils produce heavy growth of stem and leaves but the plants do not fruit well, applications of phosphoric acid fertilizers may correct this condition. Where the soil fertility has begun to decrease on account of cultivation over a long period of years, fertilizers will probably be of advantage. Fertilizers may also be of advantage for vegetable crops on soils which would not respond well enough to fertilizers for the ordinary field crops.

## Use of Lime

Few of the soils described in this bulletin are acid and lime is not needed on most of them. If lime may be needed, it will be mentioned in the discussion of the soils of the county concerned.

The use of lime on well-drained sandy soils is not advisable except in connection with a legume rotation, for the reason that application of lime is likely to stimulate the production of nitrates and cause loss of nitrogen of the soil during the winter months. At the present time these surface soils are generally not acid enough to be injurious to crops ordinarily grown, but they may become more acid after longer cultivation.

## Differences in composition at different depths

The composition of a soil in horizons at different depths sometimes varies markedly. The change in composition with increase in depth may occur either with noncalcareous or calcareous soils. In Cass County (Table 4) active phosphoric acid and active potash in a Bowie fine sandy loam (Nos. 37654-8 inclusive) decreased considerably; and nearly all constituents in a Kirvin fine sandy loam (Nos. 37659-63 inclusive) decreased markedly, while the pH (intensity of acidity) changed from pH 5.1 to pH 4.2, the latter acidity being sufficiently high to inhibit growth of most crops. In most calcareous soils, the lime content increases with depth, while other constituents usually decrease. One of the most striking cases of this occurs in an Irving clay loam (Nos. 35601-2-3, Table 10) in Falls County. The surface horizon (0-12″) contained 2.98% acid soluble lime, the subsoil (12″-24″) contained 20.75% and the deep subsoil contained 39.05%. Corresponding figures for nitrogen were .148%, .126%, and .058%; those for active phosphoric acid were 116 parts per million, 4 p. p. m., and 2 p. p. m.; and for active potash the figures were 256 p. p. m., 65 p. p. m., and 26 p. p. m. Nitrogen, active phosphoric acid, and active potash all tend to decrease markedly with lower depths in most soils, as is shown in all tables in this bulletin giving the composition of the soils. This fact is of great practical importance, because the soil left on an area after the topsoil has been removed by erosion is of much lower fertility than the original soil which was washed away.

## Soils of Cass County

Cass County comprises an area of 951 square miles in the extreme northeastern part of Texas and lies wholly within the geographical division known as the East Texas Timber Country. From this county twenty types and phases of soil in 16 series were mapped. The most extensive soil type is the Ruston fine sandy loam, which, in the normal and deep phases, occupies 26.2 per cent of the area. Next in extent is the Kirvin fine sandy loam, which, in the normal and stony phases, occupies 24.8 per cent of the area. Upland soils include the red Nacogdoches soils (0.4 per cent); light-colored soils with friable subsoils of the Ruston, Cahaba, Bowie, Kirvin, Orangeburg, Caddo, Kalmia, and Norfolk series (82.6 per cent); and light-colored soils with dense subsoils of the Susquehanna, Leaf, and Lufkin series (2.9 per cent). Flat stream-bottom soils include the Bibb, Ochlockonee, and Johnston series (14.9 per cent).

## Description of Soils

**Upland Soils:**

**Bowie soils**—Gray topsoil grading into pale-yellow subsoil which passes gradually into a deep subsoil of yellow, friable material, containing red spots and splotches. Covers 20.5 per cent of area.

**Kirvin soils**—Gray topsoil containing a few fine, dark ferruginous sandstone fragments, grading into pale-yellow, friable subsoil which in places contains fine ironstone fragments and ranging through a short transitional zone into a red or brownish-red, moderately heavy, crumbly, slightly sandy clay deep subsoil. Covers 24.8 per cent of area.

**Nacogdoches soils**—Red or reddish-brown topsoil containing a large quantity of small and fine, dark ironstone fragments grading into a red, smooth, crumbly clay subsoil containing small ironstone fragments. Covers 0.4 per cent of area.

**Ruston soils**—Gray topsoil which grades into a yellow, full-yellow, grayish-yellow, or brownish-yellow subsoil which merges into a light reddish-yellow or yellowish-red, friable deep subsoil which becomes slightly more yellow with increase in depth. Covers 28.2 per cent of area.

**Bottom Land Soils:**

**Bibb soils**—Light-gray topsoil containing a few yellow and brown spots and splotches, grading into mottled gray and yellow clay loam or clay subsoil. Covers 10.4 per cent of area.

**Composition of Soils**—Table 4 gives the analyses of a number of the principal soil types and Table 5 the grades of constituents of the surface soils. The soils are probably deficient (Grades 4 and 5) in nitrogen, total and active phosphoric acid, total and acid-soluble potash. A few exceptions to this general statement are to be noted in the table, but in all of these cases the constituent has Grade 3 and may be deficient for certain crops. Most of the soils are moderate (Grade 3) in active potash. All of them are low (Grade 5) in basicity. The reaction (pH) of some samples of Nacogdoches and Ruston fine sandy loams may be sufficiently acid (Grade 4) to interfere with the growth of leguminous crops.

**Pot Experiments**—Results of pot experiments are given in Table 6. All of the soils used in greenhouse work responded greatly to nitrogen and phosphoric acid, but did not respond to potash.

**Fertilizers**—The need for fertilizers carrying nitrogen and phosphoric acid is indicated in most of the soils. A need for potash fertilizers is not indicated except possibly on small areas or for special crops or where the land has been under cultivation for a number of years. Some of the soils might respond to lime, especially if leguminous crops or crops with a high lime requirement are to be grown.

**Table 4. Analyses of soils of Cass County**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7239 | Bibb fine sandy loam, probably, surface | .048 | .042 | 97 | ........ | .07 | 94 | .28 | .15 | .08 | 6.4 | 0–8 |
| 7240 | Bibb fine sandy loam, probably, subsoil | .024 | .041 | 43 | ........ | .45 | 81 | .38 | .10 | .06 | 6.3 | 8–20 |
| 3349 | Bowie fine sandy loam, probably, surface | .024 | .015 | 24 | ........ | .17 | 75 | .12 | .10 | .07 | ........ | 0–6 |
| 3350 | Bowie fine sandy loam, probably, subsoil | .025 | .007 | 7 | .43 | .09 | 154 | .12 | .24 | .09 | ........ | 6–18 |
| 37646 | Bowie fine sandy loam, surface | .034 | .021 | 12 | .43 | .09 | 87 | .06 | .01 | .07 | 5.6 | 0–7 |
| 37647 | Bowie fine sandy loam, subsoil | .035 | .035 | 4 | .34 | .26 | 90 | .08 | .11 | .18 | 4.6 | 7–19 |
| 37654 | Bowie fine sandy loam, surface | .037 | .025 | 9 | .30 | .07 | 146 | .14 | .01 | .07 | 5.5 | 0–4 |
| 37655 | Bowie fine sandy loam, subsoil | .027 | .025 | 5 | .58 | .06 | 115 | .13 | 0 | .10 | 5.5 | 4–10 |
| 37656 | Bowie fine sandy loam, deep subsoil | .037 | .034 | 4 | .51 | .18 | 110 | .09 | .11 | .18 | 4.9 | 10–24 |
| 37657 | Bowie fine sandy loam, deep subsoil | .032 | .036 | 4 | .38 | .16 | 87 | .07 | .06 | .16 | 4.7 | 24–60 |
| 37658 | Bowie fine sandy loam, deep subsoil | .022 | .039 | 4 | .27 | .20 | 83 | .13 | .17 | .16 | 4.6 | 60–80 |
| Average | Bowie fine sandy loam, surface | .032 | .020 | 15 | .37 | .11 | 103 | .11 | .04 | .07 | 5.6 | ........ |
| Average | Bowie fine sandy loam, subsoil | .029 | .022 | 5 | .45 | .14 | 120 | .11 | .12 | .12 | 5.1 | ........ |
| Average | Bowie fine sandy loam, deep subsoil | .030 | .036 | 4 | .39 | .18 | 93 | .10 | .11 | .17 | 4.7 | ........ |
| 7112 | Kirvin fine sandy loam, probably, surface | .070 | .051 | (124) | ........ | .07 | 131 | .31 | .20 | .06 | 6.1 | 0–6 |
| 7113 | Kirvin fine sandy loam, probably, subsoil | .035 | ........ | 10 | ........ | .05 | 88 | .28 | .12 | .09 | 5.8 | 6–12 |
| 7167 | Kirvin fine sandy loam, probably, surface | .038 | .065 | (264) | ........ | .04 | 126 | .16 | .30 | .06 | 6.5 | 0–12 |
| 7168 | Kirvin fine sandy loam, probably, subsoil | .025 | .036 | 91 | .30 | .06 | 75 | .07 | .09 | .10 | 7.2 | 7–19 |
| 37648 | Kirvin fine sandy loam, surface | .029 | .033 | 35 | .36 | .12 | 88 | .06 | .01 | .07 | 5.1 | 0–7 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 37649 | Kirvin fine sandy loam, subsoil | .058 | .040 | 8 | .53 | .33 | 223 | .09 | .11 | .21 | 4.5 | 7–19 |
| 37659 | Kirvin fine sandy loam, surface | .111 | .047 | 16 | .58 | .12 | 200 | .12 | .06 | .11 | 5.1 | 0–4 |
| 37660 | Kirvin fine sandy loam, subsoil | .059 | .037 | 8 | .45 | .08 | 118 | .09 | 0 | .07 | 5.4 | 4–15 |
| 37661 | Kirvin fine sandy loam, deep subsoil | .054 | .043 | 7 | .70 | .23 | 203 | .07 | .07 | .20 | 4.6 | 15–30 |
| 37662 | Kirvin fine sandy loam, deep subsoil | .038 | .027 | 6 | .84 | .20 | 155 | .05 | 0 | .19 | 4.2 | 30–48 |
| 37663 | Kirvin fine sandy loam, deep subsoil | .020 | .018 | 4 | .81 | .10 | 63 | .06 | 0 | .10 | 4.2 | 48–72 |
| Average | Kirvin fine sandy loam, surface | .062 | .049 | 25 | .47 | .09 | 136 | .16 | .14 | .08 | 5.7 | ........ |
| Average | Kirvin fine sandy loam, subsoil | .044 | .038 | 29 | .43 | .13 | 126 | .13 | .08 | .12 | 5.7 | ........ |
| Average | Kirvin fine sandy loam, deep subsoil | .037 | .029 | 6 | .78 | .18 | 140 | .06 | .02 | .16 | 4.3 | ........ |
| 37650 | Nacogdoches fine sandy loam, surface | .040 | .061 | 6 | .42 | .18 | 146 | .08 | .13 | .09 | 5.4 | 0–7 |
| 37651 | Nacogdoches fine sandy loam, subsoil | .040 | .067 | 6 | .60 | .40 | 183 | .16 | .22 | .28 | 5.3 | 7–19 |
| 22917 | Ruston fine sand, probably, surface | .037 | .029 | (122) | .47 | ........ | 122 | ........ | .10 | ........ | ........ | ........ |
| 22918 | Ruston fine sand, probably, subsoil | .019 | .033 | 28 | .42 | ........ | 97 | ........ | .08 | ........ | ........ | ........ |
| 7149 | Ruston fine sandy loam, probably, surface | .029 | .039 | 26 | ........ | .06 | 86 | .13 | .10 | .06 | 6.3 | 0–6 |
| 7150 | Ruston fine sandy loam, probably, subsoil | .021 | .013 | 12 | ........ | .08 | 46 | .70 | .15 | .06 | ........ | 6–18 |
| 37652 | Ruston fine sandy loam, surface | .025 | .019 | 7 | .20 | .24 | 98 | .12 | .02 | .11 | 5.4 | 0–7 |
| 37653 | Ruston fine sandy loam, subsoil | .036 | .027 | 5 | .29 | .26 | 159 | .13 | .06 | .15 | 5.3 | 7–19 |
| 37664 | Ruston fine sandy loam, surface | .039 | .025 | 8 | .21 | .06 | 122 | .08 | .04 | .06 | 4.9 | 0–4 |
| 37665 | Ruston fine sandy loam, subsoil | .023 | .021 | 7 | .22 | .05 | 117 | .06 | 0 | .05 | 5.3 | 4–12 |
| 37666 | Ruston fine sandy loam, deep subsoil | .029 | .031 | 4 | .18 | .15 | 197 | .13 | .21 | .15 | 5.3 | 12–24 |
| 37667 | Ruston fine sandy loam, deep subsoil | .025 | .027 | 5 | .36 | .20 | 212 | .19 | .32 | .18 | 5.0 | 24–40 |
| 37668 | Ruston fine sandy loam, deep subsoil | .020 | .027 | 5 | .38 | .18 | 136 | .08 | .07 | .14 | 5.1 | 40–72 |
| Average | Ruston fine sandy loam, surface | .031 | .028 | 14 | .21 | .12 | 102 | .11 | .05 | .08 | 5.5 | ........ |
| Average | Ruston fine sandy loam, subsoil | .027 | .020 | 8 | .26 | .13 | 107 | .30 | .07 | .09 | 5.3 | ........ |
| Average | Ruston fine sandy loam, deep subsoil | .025 | .028 | 5 | .31 | .18 | 182 | .13 | .20 | .16 | 5.1 | ........ |

**Table 5. Grades of constituents of surface soils of Cass County**

| Laboratory Number | Soil type | Nitrogen | Total Phos. Acid | Active Phos. Acid | Total Potash | Acid-Soluble Potash | Active Potash | Acid-Soluble Lime | Basicity | Acid-Soluble Magnesia | pH |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7239 | Bibb fine sandy loam | 4 | 4 | 4 | ........ | 5 | 4 | 3 | 5 | 4 | 2 |
| Average | Bowie fine sandy loam | 4 | 5 | 5 | 4 | 4 | 3 | 4 | 5 | 5 | 3 |
| Average | Kirvin fine sandy loam | 3 | 4 | 5 | 4 | 5 | 3 | 4 | 5 | 4 | 3 |
| 37650 | Nacogdoches fine sandy loam | 4 | 3 | 5 | 4 | 4 | 3 | 5 | 5 | 4 | 4 |
| 22917 | Ruston fine sand, probably | 4 | 4 | ........ | 4 | ........ | 3 | ........ | 5 | ........ | ........ |
| Average | Ruston fine sandy loam | 4 | 4 | 5 | 5 | 4 | 3 | 4 | 5 | 4 | 4 |

**Table 6. Pot experiments on soils of Cass County**

| Laboratory Number | Soil type and crop | Weight of crop in grams | | | | Corn possibility of plant food withdrawn, in bushels | | |
|---|---|---|---|---|---|---|---|---|
| | | With complete fertilizer | Without phosphoric acid | Without nitrogen | Without potash | Phosphoric acid | Nitrogen | Potash |
| 7239 | Bibb fine sandy loam, surface, corn | 40.0 | ......... | 16.3 | ......... | ......... | 25 | ......... |
| 7239 | Bibb fine sandy loam, surface, corn | 39.9 | ......... | 12.2 | ......... | ......... | 15 | ......... |
| 7239 | Bibb fine sandy loam, surface, sorghum | 20.9 | ......... | 4.5 | ......... | ......... | 11 | ......... |
| 7239 | Bibb fine sandy loam, surface, sorghum | 31.7 | ......... | 4.5 | ......... | ......... | 7 | ......... |
| 7240 | Bibb fine sandy loam, probably, subsoil, corn | 38.7 | 12.6 | ......... | ......... | 27 | ......... | ......... |
| 7240 | Bibb fine sandy loam, probably, subsoil, corn | 35.1 | 18.4 | ......... | ......... | 26 | ......... | ......... |
| 7240 | Bibb fine sandy loam, probably, subsoil, sorghum | 7.7 | 6.5 | ......... | ......... | 10 | ......... | ......... |
| 7240 | Bibb fine sandy loam, probably, subsoil, sorghum | 24.4 | 11.5 | ......... | ......... | 18 | ......... | ......... |
| 37646 | Bowie fine sandy loam, surface, corn | 35.2 | 8.8 | 7.8 | 36.7 | 14 | 10 | 122 |
| 37646 | Bowie fine sandy loam, surface, kafir | 19.5 | 8.8 | 3.7 | 19.5 | 11 | 34 | 34 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3350 | Bowie fine sandy loam, probably, subsoil, corn | 35.5 | ..... | ..... | 28.7 | ..... | ..... | 145 |
| 3350 | Bowie fine sandy loam, probably, subsoil, corn | 9.9 | ..... | ..... | 7.9 | ..... | ..... | 23 |
| 3350 | Bowie fine sandy loam, probably, subsoil, sorghum | 12.4 | ..... | ..... | 10.0 | ..... | ..... | 30 |
| 3350 | Bowie fine sandy loam, probably, subsoil, sorghum | 0.2 | ..... | ..... | 4.2 | ..... | ..... | 13 |
| 7112 | Kirvin fine sandy loam, probably, surface, corn | 46.7 | ..... | 23.0 | ..... | ..... | 31 | ..... |
| 7112 | Kirvin fine sandy loam, probably, surface, corn | 31.7 | ..... | 5.0 | ..... | ..... | 7 | ..... |
| 7112 | Kirvin fine sandy loam, probably, surface, sorghum | 11.5 | ..... | 3.4 | ..... | ..... | 8 | ..... |
| 7112 | Kirvin fine sandy loam, probably, surface, sorghum | 32.4 | ..... | 3.9 | ..... | ..... | 8 | ..... |
| 37648 | Kirvin fine sandy loam, surface, corn | 51.9 | 27.0 | 15.1 | 46.7 | 36 | 19 | 125 |
| 37648 | Kirvin fine sandy loam, surface, kafir | 22.3 | ..... | 7.6 | 22.6 | 8 | 11 | 40 |
| 7167 | Kirvin fine sandy loam, probably, surface, corn | 49.9 | ..... | 20.7 | ..... | ..... | 24 | ..... |
| 7167 | Kirvin fine sandy loam, probably, surface, corn | 35.9 | ..... | 6.5 | ..... | ..... | 10 | ..... |
| 7167 | Kirvin fine sandy loam, probably, surface, sorghum | 33.7 | ..... | 4.2 | ..... | ..... | 8 | ..... |
| 7167 | Kirvin fine sandy loam, probably, surface, sorghum | 3.6 | ..... | 4.3 | ..... | ..... | 9 | ..... |
| 7113 | Kirvin fine sandy loam, probably, subsoil, corn | 36.9 | ..... | 12.2 | ..... | ..... | 14 | ..... |
| 7113 | Kirvin fine sandy loam, probably, subsoil, corn | 10.5 | ..... | 2.1 | ..... | ..... | 4 | ..... |
| 7113 | Kirvin fine sandy loam, probably, subsoil, sorghum | 19.5 | ..... | 1.5 | ..... | ..... | 4 | ..... |
| 7168 | Kirvin fine sandy loam, probably, subsoil, corn | 40.5 | ..... | 11.7 | ..... | ..... | 13 | ..... |
| 7168 | Kirvin fine sandy loam, probably, subsoil, corn | 35.3 | ..... | 3.8 | ..... | ..... | 5 | ..... |
| 7168 | Kirvin fine sandy loam, probably, subsoil, sorghum | 13.5 | ..... | 1.5 | ..... | ..... | 4 | ..... |
| 7168 | Kirvin fine sandy loam, probably, subsoil, sorghum | 3.5 | ..... | 3.9 | ..... | ..... | 6 | ..... |
| 37650 | Nacogdoches fine sandy loam, surface, corn | 35.2 | 7.8 | 12.3 | 34.4 | 10 | 16 | 207 |
| 37650 | Nacogdoches fine sandy loam, surface, kafir | 23.8 | 10.5 | 4.1 | 24.2 | 9 | 5 | 84 |
| 22917 | Ruston fine sand, probably, surface, corn | 31.7 | 32.0 | 25.2 | ..... | 94 | 54 | ..... |
| 22917 | Ruston fine sand, probably, surface, cotton | 25.2 | 22.8 | ..... | ..... | 81 | ..... | ..... |
| 22917 | Ruston fine sand, probably, surface, kafir | 10.0 | 7.7 | 5.0 | ..... | 21 | 15 | ..... |
| 22918 | Ruston fine sand, probably, subsoil, cotton | 20.7 | 26.4 | 14.0 | 33.0 | 56 | 26 | 149 |
| 7149 | Ruston fine sandy loam, probably, surface, corn | 36.2 | ..... | 10.5 | ..... | ..... | 14 | ..... |
| 7149 | Ruston fine sandy loam, probably, surface, corn | 31.5 | ..... | 8.0 | ..... | ..... | 12 | ..... |
| 7149 | Ruston fine sandy loam, probably, surface, sorghum | 18.0 | ..... | 0.1 | ..... | ..... | ..... | ..... |
| 7149 | Ruston fine sandy loam, probably, surface, sorghum | 5.0 | ..... | 2.0 | ..... | ..... | 5 | ..... |
| 37652 | Ruston fine sandy loam, surface, corn | 48.5 | 3.7 | 22.0 | 45.3 | 5 | 26 | 146 |
| 37652 | Ruston fine sandy loam, surface, kafir | 30.5 | 0.6 | 5.1 | 23.1 | 1 | 7 | 36 |
| 7150 | Ruston fine sandy loam, probably, subsoil, corn | 34.9 | 14.2 | ..... | ..... | 16 | ..... | ..... |
| 7150 | Ruston fine sandy loam, probably, subsoil, corn | 12.7 | 4.1 | ..... | ..... | 5 | ..... | ..... |
| 7150 | Ruston fine sandy loam, probably, subsoil, sorghum | 16.8 | 6.5 | ..... | ..... | 12 | ..... | ..... |

## Soils of Dickens County

Dickens County comprises an area of 893 square miles in northwestern Texas and lies mostly within the Central Plains region of Texas, although a small area in the northwestern part of the county lies within the Llano Estacado or High Plains region. Thirty-three types and phases of soil in 12 series were mapped. The most extensive soil type is the Miles fine sandy loam, which, in the normal, rolling, and depression phases, covers 26.4 per cent of the area. The next most extensive is the Vernon very fine sandy loam, which, in the normal and broken phases, covers 9.6 per cent of the area. Rough and stony land in the western and southeastern parts of the county, covering 17.5 per cent of the area of the county, is too broken for cultivation. Upland soils include the brown to purplish-red soils of the Miles, Vernon, and Amarillo series (66.8 per cent of area) and the very dark to black soils of the Abilene and Richfield series (9.8 per cent). Flat stream-bottom soils include the Spur and Miller series (4.7 per cent).

## Description of Soils

### Upland Soils:

**Abilene soils**—Chocolate-brown to dark chocolate brown, noncalcareous topsoil underlain by a dark chocolate brown, heavy subsoil, which passes into chocolate brown to slightly reddish brown, deep subsoil containing considerable lime in the form of soft chalky particles. Covers 6.6 per cent of the area.

**Amarillo soils**—The silty clay loam, the only type mapped, has a dark reddish brown, heavy, silty clay loam topsoil, overlying dark reddish brown or dark brownish red, heavy clay subsoil, which passes into a salmon-colored, calcareous clay deep subsoil. Covers 2.6 per cent of area.

**Miles soils**—Dark reddish brown or dark brownish red, rather heavy topsoil overlying deep purplish red to reddish-brown, rather heavy subsoil which passes into a bright purplish-red, deep subsoil. The soils are noncalcareous at all these depths. Covers 44.8 per cent of area.

**Richfield soils**—Very dark brown to nearly black, heavy, noncalcareous topsoil grading into a dark-brown to nearly black, heavy, noncalcareous subsoil underlain by a chocolate-brown to dark reddish brown, calcareous clay subsoil containing numerous soft, whitish lime particles. Covers 3.2 per cent of area.

**Vernon soils**—Purplish-red, calcareous topsoil grading into a lighter purplish-red, calcareous subsoil which continues to a depth of three feet or more. Covers 19.4 per cent of area.

### Bottom Land Soils:

**Spur soils**—Light chocolate-brown to dark chocolate-brown, calcareous topsoil underlain by a chocolate-brown to dark chocolate-brown, calca-

**Table 7. Analyses of soils of Dickens County**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19955 | Abilene clay loam, surface... | .175 | .140 | 536 | 2.75 | .95 | 758 | 2.30 | 3.50 | 1.42 | 7.2 | 0–4 |
| 19956 | Abilene clay loam, subsoil... | .059 | .117 | 396 | 2.24 | .86 | 312 | ........ | 2.52 | ........ | 7.6 | 4–12 |
| 19957 | Abilene clay loam, deep subsoil.................. | .022 | .045 | ........ | 1.82 | .78 | ........ | (9.67) | ........ | 1.04 | 7.5 | 12–60 |
| 19974 | Abilene clay loam, surface... | .099 | .081 | 193 | 1.88 | .54 | 461 | .52 | .64 | .64 | 7.2 | 0–8 |
| 19975 | Abilene clay loam, subsoil... | .068 | .069 | 101 | 1.80 | .55 | 61 | .44 | .64 | .68 | 7.3 | 8–16 |
| 19976 | Abilene clay loam, deep subsoil.................. | .050 | .059 | 103 | 1.99 | .63 | 249 | .45 | .54 | .84 | 7.2 | 16–36 |
| Average | Abilene clay loam, surface... | .137 | .111 | 365 | 2.32 | .75 | 610 | 1.41 | 2.07 | 1.03 | 7.2 | ........ |
| Average | Abilene clay loam, subsoil... | .064 | .093 | 249 | 2.02 | .71 | 187 | .44 | 1.58 | .68 | 7.5 | ........ |
| Average | Abilene clay loam, deep subsoil.................. | .036 | .052 | 103 | 1.91 | .71 | 249 | .45 | .54 | .94 | 7.4 | ........ |
| 19983 | Abilene fine sandy loam, surface.................. | .101 | .055 | 56 | 1.66 | .39 | 215 | .41 | .15 | .50 | ........ | 0–5 |
| 19984 | Abilene fine sandy loam, subsoil.................. | .070 | .046 | 42 | 1.53 | .43 | 215 | .42 | .20 | .64 | 7.2 | 5–18 |
| 19985 | Abilene fine sandy loam, deep subsoil............ | .058 | .048 | 68 | 1.44 | .61 | 391 | 1.39 | 2.07 | .68 | 7.7 | 18–30 |
| 19968 | Amarillo silty clay loam, surface.................. | .083 | .042 | 27 | 1.52 | .34 | 194 | .36 | .20 | .40 | 6.8 | 0–6 |
| 19969 | Amarillo silty clay loam, subsoil.................. | .069 | .036 | 23 | 1.62 | .54 | 209 | .55 | .64 | .70 | 7.1 | 6–28 |
| 19970 | Amarillo silty clay loam, deep subsoil............ | .034 | .019 | 27 | 1.77 | .48 | 219 | 1.50 | 1.87 | .76 | 7.7 | 28–42 |
| 19948 | Miles clay loam, surface..... | .111 | .052 | 71 | 2.17 | .55 | 325 | .56 | 1.58 | .78 | 7.0 | 0–5 |
| 19949 | Miles clay loam, subsoil..... | ........ | .054 | 40 | 2.54 | .72 | 335 | .67 | 1.63 | .99 | 7.0 | 5–18 |
| 19950 | Miles clay loam, deep subsoil. | .063 | .043 | 65 | 2.51 | .57 | 408 | 2.17 | 3.78 | 1.07 | 7.7 | 18–30 |
| 19951 | Miles clay loam, deep subsoil. | ........ | .056 | 12 | 1.75 | .46 | 78 | 19.68 | 36.33 | 1.85 | 7.9 | 30–36 |
| 19965 | Miles fine sand, surface...... | .039 | .020 | 20 | 1.12 | .08 | 51 | .15 | .20 | .10 | 7.2 | 0–4 |
| 19966 | Miles fine sand, subsoil...... | .019 | .013 | 13 | 1.53 | .07 | 39 | .11 | .25 | .08 | 6.3 | 4–28 |
| 19967 | Miles fine sand, deep subsoil. | .041 | .020 | 11 | ........ | .34 | 98 | .31 | .30 | .45 | 6.9 | 28–36 |
| 17277 | Miles fine sandy loam, surface | .045 | .042 | 24 | ........ | .28 | 214 | .18 | 5.10 | .18 | 7.3 | 0–8 |
| 17278 | Miles fine sandy loam, subsoil | .064 | .031 | 11 | ........ | .74 | 301 | .35 | .90 | .44 | 7.2 | 8–20 |
| 17279 | Miles fine sandy loam, deep subsoil.................. | .034 | .033 | 24 | ........ | .55 | ........ | .26 | .80 | .19 | 7.0 | 20–36 |

**Table 7. Analyses of soils of Dickens County (continued)**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17292 | Miles fine sandy loam, surface | .043 | .025 | 22 | ........ | .13 | 119 | .25 | 0 | .13 | 6.5 | 0–10 |
| 17293 | Miles fine sandy loam, subsoil | .057 | .033 | 70 | ........ | .49 | 281 | .30 | .30 | .39 | 6.4 | 10–24 |
| 17294 | Miles fine sandy loam, deep subsoil | .034 | .020 | 51 | ........ | .13 | 250 | .17 | .25 | .12 | 7.1 | 24–36 |
| 19952 | Miles fine sandy loam, surface | .098 | .052 | 41 | 1.72 | .40 | 285 | .42 | 1.21 | .40 | 7.1 | 0–8 |
| 19953 | Miles fine sandy loam, subsoil | .089 | .041 | 19 | 2.00 | .60 | 358 | .49 | 1.58 | .77 | 7.2 | 8–24 |
| 19954 | Miles fine sandy loam, deep subsoil | .052 | .042 | 15 | 1.89 | .49 | 235 | .40 | 1.35 | .67 | 6.9 | 24–36 |
| 19989 | Miles fine sandy loam, flat phase, surface | .067 | .039 | 48 | 1.23 | .24 | 221 | .32 | .25 | .35 | 7.1 | 0–12 |
| 19990 | Miles fine sandy loam, flat phase, subsoil | .058 | .033 | 18 | 1.37 | .39 | 198 | .50 | .69 | .50 | 7.3 | 12–24 |
| 19991 | Miles fine sandy loam, flat phase, deep subsoil | .032 | .021 | 16 | 1.24 | .32 | 145 | .37 | .35 | .42 | 7.7 | 24–36 |
| Average | Miles fine sandy loam, surface | .063 | .040 | 34 | 1.48 | .26 | 210 | .29 | 1.64 | .27 | 7.0 | ........ |
| Average | Miles fine sandy loam, subsoil | .067 | .035 | 30 | 1.69 | .56 | 285 | .41 | .87 | .53 | 7.0 | ........ |
| Average | Miles fine sandy loam, deep subsoil | .038 | .029 | 27 | 1.57 | .37 | 210 | .30 | .69 | .35 | 7.2 | ........ |
| 19980 | Miles very fine sandy loam, rolling phase, surface | .043 | .017 | 25 | 1.17 | .06 | 101 | .17 | .15 | .16 | 7.3 | 0–10 |
| 19981 | Miles very fine sandy loam, rolling phase, subsoil | .054 | .022 | 14 | 1.51 | .38 | 198 | .43 | .79 | .52 | 7.1 | 10–18 |
| 19982 | Miles very fine sandy loam, rolling phase, deep subsoil | .046 | .016 | 12 | 1.90 | .25 | 129 | .26 | .15 | .33 | 7.3 | 18–36 |
| 19986 | Richfield silty clay loam, surface | .127 | .081 | 57 | 1.76 | .39 | 419 | .45 | .45 | .43 | 6.7 | 0–5 |
| 19987 | Richfield silty clay loam, subsoil | .064 | .073 | 155 | 1.82 | .65 | 384 | .83 | .74 | .85 | 7.5 | 5–20 |
| 19988 | Richfield silty clay loam, deep subsoil | .045 | .091 | 447 | 1.60 | .68 | 433 | 1.56 | 1.48 | .82 | 7.6 | 20–36 |
| 19936 | Spur clay loam, surface | .174 | .091 | 257 | 1.83 | .68 | 666 | 1.04 | .20 | .79 | 7.4 | 0–10 |
| 19937 | Spur clay loam, subsoil | .096 | .068 | 69 | 1.92 | .65 | 181 | .92 | .15 | .80 | 7.3 | 10–18 |
| 19938 | Spur clay loam, deep subsoil | .076 | .061 | 157 | 1.91 | .64 | 374 | 1.84 | 1.48 | .80 | 7.7 | 18–24 |
| 19939 | Spur clay loam, deep subsoil | .050 | .055 | 111 | 1.70 | .52 | 269 | 2.33 | 2.02 | .65 | 7.5 | 24–36 |
| 19960 | Spur fine sandy loam, surface | .098 | .068 | 193 | 1.58 | .38 | 263 | 3.25 | 3.11 | .67 | 7.4 | 0–6 |
| 19961 | Spur fine sandy loam, subsoil | .078 | .067 | 164 | 2.05 | .40 | 163 | 4.25 | 3.81 | .67 | 7.4 | 6–12 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19962 | Spur fine sandy loam, subsoil | .063 | .069 | 236 | 1.98 | .39 | 260 | 5.48 | 10+ | .71 | 7.3 | 12–20 |
| 19963 | Spur fine sandy loam, deep subsoil | .060 | .061 | 255 | 1.72 | .41 | 286 | 3.30 | ........ | .75 | 7.6 | 20–30 |
| 19964 | Spur fine sandy loam, deep subsoil | .047 | .063 | 188 | 1.63 | .38 | 174 | 4.18 | 4.33 | .70 | 7.6 | 30–36 |
| 19958 | Spur loam, surface | .105 | .104 | 422 | 1.68 | .60 | 460 | 4.12 | 6.26 | .75 | 7.6 | 0–8 |
| 19959 | Spur loam, subsoil | .058 | .092 | 178 | 1.79 | .74 | 186 | 7.90 | 10+ | 1.28 | 8.0 | 8–36 |
| 19971 | Spur loamy fine sand, surface | .049 | .049 | 125 | 1.64 | .21 | 125 | 2.30 | 2.36 | .45 | 7.3 | 0–10 |
| 19972 | Spur loamy fine sand, subsoil | .036 | .041 | 150 | 1.69 | .20 | 114 | 2.90 | 4.15 | .40 | 7.5 | 10–24 |
| 19973 | Spur loamy fine sand, deep subsoil | .020 | .041 | 130 | 1.52 | .21 | 100 | 4.00 | 4.55 | .45 | 7.7 | 24–36 |
| 19940 | Spur very fine sandy loam, surface | .107 | .073 | 307 | 1.48 | .46 | 499 | 3.36 | 4.55 | .73 | 7.3 | 0–8 |
| 19941 | Spur very fine sandy loam, subsoil | .049 | .067 | 28 | 2.12 | .52 | 279 | 7.89 | 14.40 | .67 | 7.5 | 8–30 |
| 19942 | Spur very fine sandy loam, deep subsoil | .027 | .054 | 244 | 2.04 | .37 | 98 | 5.37 | 10.28 | .76 | 7.6 | 30–36 |
| 17250 | Vernon clay loam, surface | .116 | .133 | 394 | ........ | .87 | 712 | 1.21 | 1.60 | 1.41 | 6.8 | 0–6 |
| 17251 | Vernon clay loam, subsoil | .064 | .159 | 709 | 3.58 | .85 | 282 | 4.69 | 7.85 | 1.96 | 7.9 | 6–18 |
| 17252 | Vernon clay loam, deep subsoil | .053 | .155 | 512 | ........ | .86 | 227 | 3.95 | 10.86 | 1.21 | 7.8 | 18–36 |
| 17301 | Vernon clay loam, surface | .113 | .078 | 142 | ........ | .86 | 477 | 3.91 | 7.10 | .70 | 7.5 | 0–4 |
| 17302 | Vernon clay loam, subsoil | .091 | .068 | 105 | ........ | .84 | 120 | 7.48 | 10+ | 1.58 | 7.3 | 4–20 |
| 17303 | Vernon clay loam, deep subsoil | .057 | .104 | ........ | ........ | .75 | 53 | 14.62 | 10+ | .63 | 7.8 | 20–36 |
| 17304 | Vernon clay loam, surface | .096 | ........ | 205 | ........ | .84 | 509 | 2.02 | 4.40 | .85 | ........ | 0–6 |
| 17305 | Vernon clay loam, subsoil | .070 | .078 | 110 | ........ | .84 | 299 | 3.33 | 5.05 | 1.40 | 7.8 | 6–24 |
| 17306 | Vernon clay loam, deep subsoil | .051 | .065 | 7 | ........ | .76 | ........ | 9.56 | 10+ | 1.34 | 8.0 | 24–36 |
| 19945 | Vernon clay loam, flat phase, surface | .140 | .082 | 236 | 3.16 | .71 | 314 | .78 | 1.14 | 1.68 | 7.5 | 0–4 |
| 19946 | Vernon clay loam, flat phase, subsoil | .095 | .069 | 231 | 3.17 | .66 | 276 | 2.67 | 4.72 | 1.87 | 7.5 | 4–12 |
| 19947 | Vernon clay loam, flat phase, deep subsoil | .046 | .114 | 12 | 3.03 | .58 | 80 | 12.05 | 10+ | 2.87 | 7.7 | 12–36 |
| 19977 | Vernon clay loam, surface | .122 | .108 | 414 | 2.81 | .41 | 203 | 3.26 | 4.50 | .80 | 7.5 | 0–5 |
| 19978 | Vernon clay loam, subsoil | .084 | .112 | 278 | 2.84 | .54 | 104 | 8.84 | 18.60 | 1.28 | 7.7 | 5–18 |
| 19979 | Vernon clay loam, deep subsoil | .032 | .131 | 584 | 2.71 | .62 | 98 | 6.41 | 16.26 | 1.46 | 7.7 | 18–36 |
| Average | Vernon clay loam, surface | .117 | .100 | 278 | 2.99 | .74 | 443 | 2.24 | 3.75 | 1.09 | 7.3 | ........ |
| Average | Vernon clay loam, subsoil | .081 | .097 | 287 | 3.20 | .75 | 216 | 5.40 | 9.06 | 1.62 | 7.6 | ........ |
| Average | Vernon clay loam, deep subsoil | .048 | .114 | 279 | 2.87 | .71 | 115 | 9.32 | 13.56 | 1.50 | 7.8 | ........ |
| 19943 | Vernon very fine sandy loam, surface | .068 | .095 | 326 | 2.55 | .36 | 131 | 6.48 | 7.56 | 1.47 | 7.5 | 0–12 |
| 19944 | Vernon very fine sandy loam, subsoil | .053 | .095 | 280 | 2.39 | .30 | 81 | 6.68 | 14.60 | 1.10 | 7.5 | 12–36 |

**Table 8. Grades of constituents of surface soils of Dickens County**

| Laboratory Number | Soil type | Nitrogen | Total Phos. Acid | Active Phos. Acid | Total Potash | Acid-Soluble Potash | Active Potash | Acid-Soluble Lime | Basicity | Acid-Soluble Magnesia | pH |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | Abilene clay loam | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 2 |
| 19983 | Abilene fine sandy loam | 3 | 3 | 4 | 2 | 3 | 2 | 2 | 5 | 2 | ...... |
| 19968 | Abilene silty clay loam | 3 | 4 | 5 | 2 | 3 | 3 | 3 | 5 | 2 | 2 |
| 19948 | Miles clay loam | 3 | 3 | 4 | 1 | 2 | 2 | 2 | 3 | 1 | 2 |
| 19965 | Miles fine sand | 4 | 5 | 5 | 3 | 5 | 4 | 4 | 5 | 4 | 2 |
| Average | Miles fine sandy loam | 3 | 4 | 4 | 2 | 3 | 2 | 3 | 3 | 3 | 2 |
| 19980 | Miles very fine sandy loam, rolling phase | 4 | 5 | 5 | 3 | 5 | 3 | 4 | 5 | 3 | 2 |
| 19986 | Richfield silty clay loam | 2 | 3 | 4 | 2 | 3 | 1 | 2 | 4 | 2 | 2 |
| 19936 | Spur clay loam | 2 | 3 | 2 | 1 | 2 | 1 | 2 | 5 | 1 | 2 |
| 19960 | Spur fine sandy loam | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 1 | 2 |
| 19958 | Spur loam | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 19971 | Spur loamy fine sand | 4 | 4 | 3 | 2 | 3 | 3 | 1 | 2 | 2 | 2 |
| 19940 | Spur very fine sandy loam | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 |
| Average | Vernon clay loam | 3 | 3 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 |
| 19943 | Vernon very fine sandy loam | 3 | 3 | 2 | 1 | 3 | 3 | 1 | 1 | 1 | 2 |

Table 9. Composition of soluble salts in some of the soils of Dickens County

(parts per million)

| Lab. No. | | Depth Inches | Calc. Carb. | Calc. Sulp. | Mag. Carb. | Mag. Sulp. | Sod. Sulp. | Sod. Chlor. |
|---|---|---|---|---|---|---|---|---|
| 13244 | Surface soil..... | 0–8 | 302 | ........ | 167 | ........ | 557 | 239 |
| 13245 | Subsoil......... | 8–20 | 367 | ........ | 48 | 119 | 742 | 219 |
| 26224 | Surface soil..... | 0–15 | 275 | 2850 | ........ | 3069 | 2154 | 3613 |
| 26225 | Subsoil......... | 15–30 | 275 | 2561 | ........ | 2667 | 2428 | 1766 |

reous subsoil which locally becomes somewhat lighter in texture with depth and in places has a reddish-brown color. The deep subsoil is a light purplish-red, loamy, fine sand which extends several feet without much change. Covers 3.7 per cent of area.

**Composition of Soils**—Table 7 gives the analyses of a number of the principal soil types and Table 8 the grades of constituents of the surface soils. Nearly all of the soils are well supplied with all constituents. Water is the principal factor governing crop production in this county; it seems probable that most of the soils are sufficiently high in fertility to produce such crops as will be produced in the absence of irrigation.

**Pot experiments**—No pot experiments were made with any of the samples of soil from Dickens County.

**Fertilizers**—Water is the principal limiting factor for crop growth in Dickens County. Unless irrigation is provided, the use of fertilizers is not recommended. Where irrigation is provided, crops may respond to the addition of nitrogen and phosphoric acid, but probably would not respond to potash at the present time. Lime is not needed on these soils.

**Saline Soils**—The soluble salts found in two saline soils in Dickens County are given in Table 9. Sulphates make up a large part of the soluble salts, although chlorides are quite high in soils No. 26224-5. These soils probably contain considerable quantities of gypsum not in solution.

## Soils of Falls County

Falls County comprises an area of 757 square miles in east-central Texas. It lies mainly within the Blackland Prairie region, although the extreme southeastern part includes a small segment of the western fringe of the East Texas Timber Country. Thirty-five types and phases of soil in 20 series were mapped. The most extensive soil type is the Houston black clay, which occupies 17.6 per cent of the area, followed by the Wilson clay loam (10.0 per cent) and the Houston clay (9.0 per cent). Upland soils include the friable, heavy dark-colored soils of the

Houston, Bell, Lewisville, and Crockett series (32.5 per cent); the tight, heavy, dark-colored soils of the Wilson and Irving series (16.4 per cent); the dark-colored, fine sandy loams of the Wilson, Irving, Crockett, Falls, and Riesel series (16.8 per cent); and the light-colored, sandy soils of the Milam, Norfolk, Susquehanna, Tabor, and Leaf series (10.3 per cent). Alluvial soils (21.1 per cent) include soils of the Miller, Yahola, Trinity, Pledger, Catalpa, and Ochlockonee series.

## Description of Soils

### Upland Soils of the Blackland Prairies (68.6 per cent of area):

**Bell soils**—A deep, dark, calcareous topsoil with a black or very dark gray, calcareous subsoil passing downward with little change, except that the color becomes slightly lighter with increase in depth. Covers 5.0 per cent of the area.

**Crockett soils**—Dark-brown to nearly black, noncalcareous topsoil grading into a heavy clay subsoil which is brown in the clay loam and mottled gray, yellow, and red in the fine sandy loam, and grades into a yellow and gray mottled, noncalcareous, clay deep subsoil. Covers 3.7 per cent of area.

**Falls soils**—The fine sandy loam, the only type represented, has a dark ash-gray, fine sandy loam topsoil abruptly underlain by a dull-gray, dense clay subsoil containing red, yellow, and brown spots and streaks grading into a dull-gray, heavy, clay deep subsoil containing almost white particles which appear to be gypsum. Covers 4.7 per cent of area.

**Houston soils**—The black clay, to a depth ranging from 12 to 20 inches, consists of black, calcareous clay which grades into slightly lighter colored, heavy, calcareous, dark-gray clay subsoil grading into yellow or yellowish-brown marl, soft chalk, or chalky marl. The clay is less dark than the black clay, less deep in development of soil layers, and about the same in heavy structure characteristics; but it is more subject to erosion. Covers 26.6 per cent of area.

**Irving soils**—Dark-gray, noncalcareous topsoil, which, when air-dry, is tight and dense, grading very sharply into dense, gray clay, noncalcareous subsoil, which in turn grades into a slightly lighter colored gray, tough, clay deep subsoil, which, although not calcareous, contains some fine concretions of lime, increasing in number with increase in depth. Covers 6.0 per cent of area.

**Lewisville soils**—Brown, crumbly, calcareous topsoil grading into lighter brown, calcareous, crumbly clay subsoil, which in turn grades into soft, friable, yellowish-brown or buff, calcareous, clay deep subsoil containing lumps of white calcium carbonate. Covers .9 per cent of area.

**Riesel soils**—The fine sandy loam, the only type represented, has a dark grayish-brown or blackish-gray, heavy, fine sandy loam topsoil, grading into dull reddish-yellow, tough clay subsoil containing a few water-worn pebbles, which in turn grades into tough, heavy clay, deep subsoil mottled with red, gray, and yellow, which extends downward several feet and rests on marl. Covers .2 per cent of area.

**Sumter soils**—Brown or greenish-brown, calcareous topsoil grading into a yellow or greenish-yellow subsoil and thence into a calcareous, shaly clay or marl deep subsoil of yellow and gray mixed colors. Covers 1.8 per cent of area.

**Wilson soils**—Dark-gray topsoil rather heavy when wet but tight-hard, and crusted in places when dried without cultivation, resting on a heavy, tough, dense, gray subsoil of hardpan character, which grades into yellow or mottled yellow and gray, calcareous deep subsoil containing some white concretions of calcium carbonate and some fine black pellet-like concretions. Covers 19.5 per cent of area.

**Upland soils of the East Texas Timber Country (10.3 per cent of area):**

**Leaf soils**—Gray topsoil grading into yellow subsoil which grades into heavy, mottled, deep subsoil in which yellow, gray, and red colors occur in mottled form, extending down several feet and resting on beds of rounded gravel or sandy, water-laid materials. Covers 5.7 per cent of area.

**Milam soils**—Light-brown, loose topsoil which grades into red, crumbly subsoil, grading into the deep subsoil which becomes less red and assumes a yellowish-red color. Covers .8 per cent of area.

**Norfolk soils**—A thin topsoil of light-gray, loose, fine sand which grades into pale-yellow, fine sand subsoil continuing to a depth of several feet. Covers 1.3 per cent of area.

**Susquehanna soils**—Light-gray, fine sand topsoil, grading into yellow, fine sand subsoil which grades sharply into heavy, dense, red, clay deep subsoil containing mottlings of gray, and in the lower portion mottled red, gray, and yellow, fine sandy clay. Covers 2.2 per cent of area.

**Tabor soils**—Similar to the Susquehanna, but the land is less washed or eroded than that soil, and it has a more permeable subsoil. Covers .3 per cent of area.

**Alluvial soils (21.1 per cent of area):**

**Catalpa soils**—Brown or grayish-brown, heavy, calcareous clay or clay loam to a depth of several feet. Covers 5.5 per cent of area.

**Miller soils**—Chocolate-red, crumbly, calcareous topsoil which grades into slightly brighter red, calcareous, crumbly subsoil extending downward several feet. Covers 2.9 per cent of area.

**Ochlockonee soils**—Brown or light-brown topsoil grading into a yellow or yellowish-brown subsoil, which grades into a gray, fine sand or fine sandy loam, and in places dark-gray clay or mottled gray and yellow, sandy clay. Covers .6 per cent of area.

**Pledger soils**—Heavy, black, calcareous clay topsoil grading into reddish-brown or chocolate-brown, calcareous, heavy clay which extends to a depth of several feet. Covers 2.2 per cent of area.

**Trinity soils**—Black or nearly black, heavy, calcareous, clay topsoil which is very sticky when wet, crumbly when moist, and on drying separates to fine-grain aggregates, underlain by dark-gray, calcareous clay of about the same character, extending downward several feet. Covers 3.2 per cent of area.

**Yahola soils**—Dark chocolate-red, calcareous, silty clay which is crumbly when moist and on drying separates naturally to fine-grain particles, grading into a chocolate-red, calcareous, silty, clay subsoil which is permeable and crumbly, and passing into lighter textured deep subsoil which varies from place to place. Covers 6.7 per cent of area.

**Composition of soils**—The analyses of the different soil types are given in Table 10 and the grades of constituents of the surface soils in Table 11. The soils of the Blackland Prairies are moderately well supplied (Grades 3 and 2) with nitrogen, but most of the soils of the East Texas Timber Country region are probably deficient (Grades 4 and 5). With the exception of the alluvial soils, they are low in total and active phosphoric acid (Grades 4 and 5). Most of the soils are well supplied with total, acid-soluble, and active potash (Grades 1, 2, and 3), although a few are probably deficient (Grades 4 and 5), particularly in acid-soluble potash. Only soils of the Norfolk and Susquehanna series are low in acid-soluble lime, while these, with the Wilson soils, are low in acid-soluble magnesia (Grades 4 and 5). None of the soils analyzed were sufficiently acid to interfere with the growth of most crops.

**Pot experiments**—Results of pot experiments are given in Table 12. All of the soils responded well to nitrogen and phosphoric acid additions; potash was added to only a few soils, and these did not respond to the addition.

**Fertilizers**—The need of fertilizers carrying nitrogen and phosphoric acid is indicated, but the value of potash fertilization is questionable. Lime is not needed.

**Table 10. Analyses of soils of Falls County**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35186 | Bell clay, surface | .084 | .068 | 96 | .90 | .51 | 244 | 7.02 | 12.60 | .90 | 8.1 | 0–7 |
| 35175 | Bell clay, subsoil | .065 | .060 | 94 | 1.00 | .42 | 65 | 7.26 | 12.89 | 1.04 | 8.3 | 7–36 |
| 35650 | Bell clay, surface | .147 | .060 | 83 | .75 | .37 | 267 | 3.54 | 5.80 | .65 | 8.0 | 0–10 |
| 35651 | Bell clay, subsoil | .102 | .043 | 6 | .54 | .25 | 48 | 9.56 | 16.70 | .58 | 8.0 | 10–18 |
| 35652 | Bell clay, deep subsoil | .034 | .027 | 4 | .48 | .24 | 19 | 20.55 | 35.80 | .63 | 8.2 | 18–36 |
| Average | Bell clay, surface | .116 | .064 | 90 | .83 | .44 | 256 | 5.28 | 6.70 | .78 | 8.1 | ........ |
| Average | Bell clay, subsoil | .084 | .052 | 50 | .77 | .34 | 57 | 8.41 | 14.80 | .81 | 8.2 | ........ |
| Average | Bell clay, deep subsoil | .034 | .027 | 4 | .48 | .24 | 19 | 20.55 | 35.80 | .63 | 8.3 | ........ |
| 35189 | Catalpa clay, surface | .129 | .140 | 25 | 1.18 | .59 | 301 | 19.45 | 34.56 | .75 | 8.2 | 0–7 |
| 35174 | Catalpa clay, subsoil | .117 | .140 | 9 | 1.08 | .51 | 175 | 22.86 | 41.25 | .92 | 8.1 | 7–36 |
| 35613 | Catalpa clay, surface | .129 | .144 | 18 | 1.18 | .68 | 274 | 19.27 | 34.70 | .84 | 7.8 | 0–10 |
| 35614 | Catalpa clay, subsoil | .126 | .137 | 10 | .99 | .56 | 112 | 20.53 | 38.10 | 1.44 | 8.0 | 10–36 |
| Average | Catalpa clay, surface | .129 | .142 | 22 | 1.18 | .64 | 288 | 19.36 | 34.60 | .80 | 8.0 | ........ |
| Average | Catalpa clay, subsoil | .122 | .139 | 10 | 1.04 | .54 | 144 | 21.70 | 39.68 | 1.18 | 8.0 | ........ |
| 35617 | Catalpa clay loam, surface | .094 | .088 | 243 | 1.63 | .36 | 327 | .55 | .85 | .46 | 7.5 | 0–10 |
| 35618 | Catalpa clay loam, subsoil | .083 | .069 | 161 | 1.60 | .32 | 252 | .57 | .90 | .43 | 7.5 | 10–36 |
| 35609 | Crockett clay loam, surface | .073 | .038 | 7 | 1.34 | .50 | 255 | .61 | 1.05 | .91 | 6.9 | 0–10 |
| 35610 | Crockett clay loam, subsoil | .048 | .085 | (162) | 1.92 | .66 | 216 | 2.25 | 3.11 | 1.26 | 8.0 | 10–36 |
| 35170 | Crockett fine sandy loam, surface | .068 | .028 | 6 | 1.65 | .19 | 175 | .23 | .38 | .16 | 6.7 | 0–7 |
| 35173 | Crockett fine sandy loam, subsoil | .049 | .022 | 4 | 1.54 | .28 | 105 | .33 | .65 | .36 | 6.6 | 30–36 |
| 35604 | Crockett fine sandy loam, surface | .057 | .030 | 6 | ........ | ........ | 167 | ........ | .02 | ........ | 7.4 | 0–12 |
| 35605 | Crockett fine sandy loam, subsoil | .071 | .032 | 4 | ........ | ........ | 185 | ........ | .51 | ........ | 6.8 | 12–24 |
| 35607 | Crockett fine sandy loam, deep subsoil | .030 | .031 | 5 | ........ | ........ | 135 | ........ | .50 | ........ | 6.7 | 24–36 |
| Average | Crockett fine sandy loam, surface | .063 | .029 | 6 | 1.65 | .19 | 171 | .23 | .20 | .16 | 7.0 | ........ |
| Average | Crockett fine sandy loam, subsoil | .060 | .027 | 4 | 1.54 | .28 | 145 | .33 | .58 | .36 | 6.7 | ........ |
| Average | Crockett fine sandy loam, deep subsoil | .030 | .031 | 5 | ........ | ........ | 135 | ........ | .50 | ........ | 6.7 | ........ |
| 35167 | Falls fine sandy loam, surface | .059 | .024 | 10 | .95 | .27 | 127 | .14 | .30 | .14 | 7.1 | 0–7 |
| 35171 | Falls fine sandy loam, subsoil | .059 | .022 | 5 | .98 | .29 | 102 | .61 | 1.10 | .36 | 7.3 | 7–20 |
| 35178 | Falls fine sandy loam, deep subsoil | .047 | .026 | 4 | .97 | .28 | 114 | .59 | 1.02 | .35 | 7.6 | 20–36 |

**Table 10. Analyses of soils of Falls County (continued)**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35588 | Falls fine sandy loam, surface | .060 | .024 | 5 | 1.02 | .22 | 108 | .23 | .38 | .20 | 6.8 | 0–10 |
| 35589 | Falls fine sandy loam, subsoil | .058 | .025 | 4 | .93 | .41 | 133 | .59 | 1.00 | .57 | 6.9 | 10–15 |
| 35590 | Falls fine sandy loam, deep subsoil | .024 | .019 | 2 | 1.03 | .23 | 126 | .49 | .85 | .42 | 7.6 | 15–36 |
| Average | Falls fine sandy loam, surface | .060 | .024 | 8 | .99 | .25 | 118 | .19 | .34 | .17 | 7.0 | ........ |
| Average | Falls fine sandy loam, subsoil | .059 | .024 | 5 | .96 | .35 | 118 | .60 | 1.05 | .47 | 7.1 | ........ |
| Average | Falls fine sandy loam, deep subsoil | .036 | .023 | 3 | 1.00 | .26 | 120 | .54 | .94 | .39 | 7.6 | ........ |
| 35180 | Houston black clay, on chalk, surface | .170 | .124 | 14 | .73 | .43 | 69 | 20.93 | 48.81 | .96 | 8.2 | 0–7 |
| 35176 | Houston black clay, on chalk, subsoil | .122 | .110 | 10 | .63 | .31 | 13 | 27.64 | 47.40 | .90 | 8.3 | 7–24 |
| 35184 | Houston black clay, on chalk, deep subsoil | .083 | .119 | 4 | .39 | .22 | 20 | 37.24 | 68.80 | .67 | 8.2 | 24–40 |
| 35188 | Houston black clay, on marl, surface | .095 | .064 | 139 | 1.33 | .64 | 390 | 3.57 | 5.63 | 1.22 | 8.0 | 0–7 |
| 35182 | Houston black clay, on marl, subsoil | .079 | .078 | 197 | 1.96 | .81 | 236 | 4.90 | 7.63 | 1.02 | 7.6 | 7–24 |
| 35190 | Houston black clay, on marl, deep subsoil | .089 | .071 | 160 | 1.90 | .83 | 255 | 4.74 | 7.15 | 1.21 | 7.9 | 24–36 |
| 35599 | Houston black clay, flat phase, surface | .070 | .060 | 113 | ........ | ........ | 341 | ........ | 5.95 | ........ | 8.2 | 0–10 |
| 35600 | Houston black clay, flat phase, subsoil | .063 | .056 | 110 | ........ | ........ | 270 | ........ | 6.10 | ........ | 8.1 | 10–36 |
| 35635 | Houston black clay, on chalk, surface | .160 | .127 | 18 | .69 | ........ | 87 | ........ | 38.40 | ........ | 7.7 | 0–7 |
| 35636 | Houston black clay, on chalk, subsoil | .119 | .129 | 10 | .49 | ........ | 44 | ........ | 51.50 | ........ | 7.9 | 7–20 |
| 35637 | Houston black clay, on chalk, deep subsoil | .070 | .121 | 5 | 1.20 | ........ | 31 | ........ | 74.10 | ........ | 8.0 | 20–36 |
| 35638 | Houston black clay, on marl, surface | .076 | .082 | 106 | .40 | ........ | 226 | ........ | 11.05 | ........ | 8.0 | 0–15 |
| 35639 | Houston black clay, on marl, subsoil | .052 | .066 | 40 | 1.20 | ........ | 142 | ........ | 13.40 | ........ | 8.2 | 15–30 |
| 35640 | Houston black clay, on marl, deep subsoil | .045 | .094 | 49 | 1.92 | ........ | 95 | ........ | 17.60 | ........ | 7.6 | 30–36 |
| Average | Houston black clay, surface.. | .114 | .091 | 78 | .79 | .54 | 223 | 12.25 | 21.97 | 1.09 | 8.0 | ........ |
| Average | Houston black clay, subsoil.. | .087 | .088 | 73 | 1.07 | .56 | 141 | 16.27 | 25.21 | .96 | 8.0 | ........ |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | Houston black clay, deep subsoil | .072 | .101 | 55 | 1.35 | .53 | 100 | 20.99 | 41.91 | .94 | 7.9 | ........ |
| 35596 | Houston clay, gray phase, surface | .197 | .150 | 17 | .45 | .22 | 49 | 37.04 | 71.10 | .79 | 7.9 | 0–7 |
| 35597 | Houston clay, gray phase, subsoil | .067 | .162 | 7 | .32 | .15 | 17 | 47.22 | 84.80 | .69 | 8.2 | 7–20 |
| 35598 | Houston clay, gray phase, deep subsoil | .023 | .161 | 6 | .34 | .16 | 24 | 46.92 | 84.00 | .71 | 8.3 | 20–36 |
| 35627 | Houston clay, on chalk, surface | .125 | .068 | 12 | .61 | .25 | 92 | 12.97 | 22.60 | .61 | 8.0 | 0–7 |
| 35628 | Houston clay, on chalk, subsoil | .081 | .049 | 4 | .57 | .17 | 15 | 22.06 | 38.40 | .55 | 8.0 | 7–24 |
| 35629 | Houston clay on chalk, deep subsoil | .057 | .044 | 3 | .39 | .08 | 17 | 34.27 | 61.20 | .40 | 8.1 | 24–36 |
| 35648 | Houston clay, on marl, surface | .144 | .094 | (225) | 1.64 | ........ | 491 | ........ | 10.40 | ........ | 7.7 | 0–10 |
| 35649 | Houston clay, on marl, subsoil | .042 | .119 | (608) | 2.18 | ........ | 280 | ........ | 8.79 | ........ | 7.1 | 10–36 |
| Average | Houston clay, surface | .155 | .104 | 15 | .90 | .24 | 211 | 25.36 | 34.70 | .70 | 7.9 | ........ |
| Average | Houston clay, subsoil | .063 | .110 | 6 | 1.02 | .16 | 104 | 34.64 | 44.00 | .62 | 7.8 | ........ |
| Average | Houston clay, deep subsoil | .040 | .103 | 5 | .37 | .12 | 21 | 40.60 | 72.60 | .56 | 8.2 | ........ |
| 35579 | Irving clay loam, surface | .079 | .028 | 11 | .54 | .23 | 130 | .82 | 1.20 | .46 | 7.5 | 0–8 |
| 35580 | Irving clay loam, subsoil | .038 | .020 | 20 | .48 | .25 | 171 | 1.62 | 2.50 | .56 | 8.2 | 8–36 |
| 35601 | Irving clay loam, shallow phase, surface | .148 | .062 | 116 | .60 | .33 | 256 | 2.98 | 4.48 | .54 | 8.1 | 0–12 |
| 35602 | Irving clay loam, shallow phase, subsoil | .126 | .061 | 4 | .68 | .41 | 65 | 20.75 | 37.50 | .84 | 8.0 | 12–24 |
| 35603 | Irving clay loam, shallow phase, deep subsoil | .058 | .049 | 2 | .44 | .17 | 26 | 39.05 | 70.60 | .54 | 8.1 | 24–36 |
| Average | Irving clay loam, surface | .114 | .045 | 64 | .57 | .28 | 193 | 1.90 | 2.84 | .50 | 7.8 | ........ |
| Average | Irving clay loam, subsoil | .082 | .041 | 12 | .58 | .33 | 118 | 11.19 | 20.00 | .70 | 8.1 | ........ |
| Average | Irving clay loam, deep subsoil | .058 | .049 | 2 | .44 | .17 | 26 | 39.05 | 70.60 | .54 | 8.1 | ........ |
| 35630 | Irving fine sandy loam, surface | .061 | .024 | 17 | .57 | .09 | 171 | .57 | .40 | .18 | 7.7 | 0–7 |
| 35631 | Irving fine sandy loam, subsoil | .036 | .013 | 7 | .68 | .18 | 104 | .60 | .89 | .37 | 6.9 | 7–17 |
| 35632 | Irving fine sandy loam, deep subsoil | .035 | .018 | 9 | .64 | .18 | 97 | .64 | .89 | .51 | 7.7 | 17–36 |
| 5100 | Leaf fine sandy loam, probably, surface | .027 | .023 | 61 | ........ | .09 | 179 | .21 | .20 | .21 | ........ | 0–11 |
| 5101 | Leaf fine sandy loam, probably, subsoil | .005 | .020 | 11 | ........ | .06 | ........ | .06 | .05 | .15 | ........ | 11–25 |
| 35583 | Leaf fine sandy loam, surface | .045 | .022 | 9 | .66 | .12 | 101 | .18 | .21 | .11 | 7.5 | 0–10 |
| 35584 | Leaf fine sandy loam, subsoil | .036 | .018 | 3 | .72 | .33 | 121 | .30 | .43 | .33 | 6.1 | 10–18 |
| 35585 | Leaf fine sandy loam, deep subsoil | .029 | .017 | 3 | .77 | .30 | 94 | .35 | .50 | .33 | 6.8 | 18–36 |
| 35591 | Leaf fine sandy loam, surface | .046 | .024 | 9 | .56 | .16 | 160 | .23 | .40 | .18 | 7.1 | 0–10 |
| 35592 | Leaf fine sandy loam, subsoil | .050 | .024 | 4 | .70 | .47 | 145 | .38 | .80 | .59 | 5.3 | 10–24 |

**Table 10. Analyses of soils of Falls County (continued)**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35593 | Leaf fine sandy loam, deep subsoil | .024 | .016 | 4 | .72 | .32 | 112 | .47 | .95 | .49 | 7.3 | 24–36+ |
| 35181 | Leaf fine sandy loam, surface | .056 | .030 | 36 | .76 | .08 | 91 | .28 | .30 | .09 | 7.5 | 0–7 |
| 35187 | Leaf fine sandy loam, subsoil | .033 | .020 | 10 | .65 | .09 | 62 | .19 | .25 | .11 | 7.8 | 7–21 |
| 35185 | Leaf fine sandy loam, deep subsoil | .043 | .028 | 5 | .84 | .27 | 126 | .61 | .64 | .25 | 7.4 | 21–36+ |
| 35653 | Leaf fine sandy loam, surface | .044 | .019 | 8 | .46 | .12 | 64 | .15 | .15 | .12 | 7.8 | 0–12 |
| 35654 | Leaf fine sandy loam, subsoil | .028 | .012 | 5 | .54 | .32 | 106 | .31 | .50 | .42 | 5.6 | 12–30 |
| 35655 | Leaf fine sandy loam, deep subsoil | .022 | .010 | 7 | .83 | .36 | 94 | .33 | .50 | .43 | 5.6 | 30–36+ |
| Average | Leaf fine sandy loam, surface | .044 | .024 | 25 | .61 | .11 | 119 | .21 | .25 | .14 | 7.5 | ........ |
| Average | Leaf fine sandy loam, subsoil | .030 | .019 | 7 | .66 | .25 | 109 | .25 | .41 | .32 | 6.2 | ........ |
| Average | Leaf fine sandy loam, deep subsoil | .030 | .018 | 5 | .79 | .31 | 107 | .44 | .65 | .38 | 6.8 | ........ |
| 35581 | Lewisville clay, surface | .096 | .152 | 21 | .89 | .43 | 80 | 22.19 | 42.20 | .63 | 8.2 | 0–10 |
| 35582 | Lewisville clay, subsoil | .068 | .130 | 7 | .67 | .27 | 50 | 32.59 | 59.40 | .61 | 8.2 | 10–36+ |
| 17597 | Milam fine sandy loam, probably, surface | .021 | .017 | 13 | ........ | .08 | 80 | .20 | .25 | .11 | ........ | 0–12 |
| 17598 | Milam fine sandy loam, probably, subsoil | .019 | .012 | 8 | ........ | .10 | 79 | .28 | .25 | .12 | ........ | 12–24 |
| 35594 | Milam fine sandy loam, surface | .061 | .046 | 81 | .59 | .15 | 87 | .47 | .70 | .16 | 8.5 | 0–12 |
| 35595 | Milam fine sandy loam, subsoil | .041 | .047 | 49 | .68 | .27 | 112 | .80 | 1.00 | .35 | 8.0 | 12–36+ |
| Average | Milam fine sandy loam, surface | .041 | .032 | 47 | .59 | .12 | 84 | .34 | .48 | .14 | 8.5 | ........ |
| Average | Milam fine sandy loam, subsoil | .030 | .030 | 29 | .62 | .19 | 96 | .54 | .63 | .24 | 8.0 | ........ |
| 35622 | Miller clay, surface | .106 | .130 | 328 | 2.50 | 1.39 | 571 | 5.80 | 11.00 | 3.04 | 7.5 | 0–7 |
| 35623 | Miller clay, subsoil | .091 | .128 | 275 | 2.66 | 1.33 | 365 | 5.46 | 10.90 | 2.23 | 7.8 | 7–36+ |
| 35169 | Norfolk fine sand, surface | .023 | .015 | 12 | 1.10 | .05 | 61 | .06 | .00 | .04 | 7.1 | 0–7 |
| 35168 | Norfolk fine sand, subsoil | .014 | .014 | 7 | 1.09 | .05 | 57 | .05 | .00 | .04 | 8.1 | 7–36+ |
| 35644 | Norfolk fine sand, surface | .038 | .018 | 41 | .57 | .05 | 139 | .11 | .05 | .06 | 7.1 | 0–7 |
| 35645 | Norfolk fine sand, subsoil | .014 | .011 | 14 | .50 | .07 | 44 | .09 | .00 | .06 | 6.9 | 7–36+ |
| Average | Norfolk fine sand, surface | .031 | .017 | 27 | .84 | .05 | 100 | .09 | .03 | .05 | 7.1 | ........ |
| Average | Norfolk fine sand, subsoil | .014 | .013 | 11 | .80 | .06 | 51 | .07 | .00 | .05 | 7.5 | ........ |
| 35611 | Ochlockonee fine sandy loam, surface | .057 | .032 | 11 | 1.51 | .19 | 122 | .27 | .28 | .18 | 6.9 | 0–10 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35612 | Ochlockonee fine sandy loam, subsoil | .035 | .024 | 7 | 1.58 | .20 | 82 | .24 | .25 | .22 | 6.6 | 10–36 + |
| 25586 | Pledger clay, surface | .134 | .114 | 227 | 1.88 | .94 | 526 | 4.02 | 6.60 | 1.90 | 8.0 | 0–7 |
| 35587 | Pledger clay, subsoil | .104 | .119 | 239 | 2.33 | 1.35 | 386 | 4.00 | 7.00 | 1.93 | 8.0 | 7–36 + |
| 35619 | Reisel fine sandy loam, surface | .076 | .037 | 20 | .54 | .21 | 108 | .43 | .61 | .26 | 7.1 | 0–7 |
| 35620 | Reisel fine sandy loam, subsoil | .055 | .017 | 6 | .59 | .39 | 130 | .54 | .80 | .45 | 5.7 | 7–12 |
| 35621 | Reisel fine sandy loam, deep subsoil | .039 | .017 | 4 | .54 | .33 | 120 | .57 | .80 | .54 | 5.5 | 12–36 + |
| 35179 | Sumter clay, surface | .082 | .097 | 10 | 1.20 | .52 | 152 | 19.75 | 34.80 | .77 | 8.1 | 0–7 |
| 35183 | Sumter clay, subsoil | .049 | .088 | 8 | 1.28 | .54 | 62 | 18.00 | 33.58 | .79 | 8.2 | 7–36 + |
| 35656 | Sumter clay, surface | .060 | .094 | 51 | 1.57 | ........ | 156 | ........ | 12.90 | ........ | 7.7 | 0–6 |
| 35657 | Sumter clay, subsoil | .041 | .118 | (642) | 2.15 | ........ | 254 | ........ | 10.00 | ........ | 7.3 | 6–36 + |
| Average | Sumter clay, surface | .071 | .096 | 31 | 1.39 | .52 | 154 | 19.75 | 23.85 | .77 | 7.9 | ........ |
| Average | Sumter clay, subsoil | .045 | .103 | 8 | 1.72 | .54 | 158 | 18.00 | 21.79 | .79 | 7.8 | ........ |
| 35641 | Susquehanna fine sandy loam, surface | .071 | .022 | 24 | .79 | ........ | 123 | ........ | .40 | ........ | 8.0 | 0–7 |
| 35642 | Susquehanna fine sandy loam, subsoil | .049 | .020 | 4 | .88 | ........ | 166 | ........ | .75 | ........ | 5.8 | 7–17 |
| 35643 | Susquehanna fine sandy loam, deep subsoil | .018 | .025 | 19 | 1.24 | ........ | 121 | ........ | 1.62 | ........ | 7.7 | 17–36 + |
| 35172 | Susquehanna fine sandy loam, surface | .024 | .020 | 10 | .99 | .06 | 75 | .06 | .10 | .05 | 7.0 | 0–7 |
| 35177 | Susquehanna fine sandy loam, subsoil | .046 | .031 | 5 | 1.16 | .40 | 175 | .15 | .20 | .09 | 7.1 | 7–36 + |
| 35633 | Susquehanna fine sandy loam, surface | .054 | .024 | 16 | 1.14 | ........ | 109 | ........ | .55 | ........ | 6.5 | 0–12 |
| 35634 | Susquehanna fine sandy loam, subsoil | .043 | .035 | 5 | 1.30 | ........ | 365 | ........ | .90 | ........ | 5.1 | 12–36 + |
| Average | Susquehanna fine sandy loam, surface | .050 | .022 | 17 | .97 | .06 | 102 | .06 | .35 | .05 | 7.2 | ........ |
| Average | Susquehanna fine sandy loam, subsoil | .038 | .029 | 5 | 1.11 | .40 | 235 | .15 | .62 | .09 | 6.0 | ........ |
| Average | Susquehanna fine sandy loam, deep subsoil | .018 | .025 | 19 | 1.24 | ........ | 121 | ........ | 1.62 | ........ | 7.7 | ........ |
| 35572 | Tabor fine sandy loam, surface | .029 | .017 | 15 | 1.09 | ........ | 74 | ........ | .00 | ........ | 6.6 | 0–10 |
| 35573 | Tabor fine sandy loam, subsoil | .050 | .030 | 3 | 1.40 | .44 | 256 | .10 | .10 | .27 | 5.4 | 10–36 + |
| 35615 | Trinity clay, surface | .158 | .123 | 47 | 1.32 | ........ | 202 | ........ | 16.50 | ........ | 8.0 | 0–10 |
| 35616 | Trinity clay, subsoil | .163 | .119 | 54 | 1.34 | ........ | 225 | ........ | 15.79 | ........ | 8.0 | 10–36 + |
| 35646 | Wilson clay, surface | .076 | .032 | 61 | .68 | ........ | 236 | ........ | 1.43 | ........ | 7.4 | 0–10 |
| 35647 | Wilson clay, subsoil | .044 | .017 | 23 | .64 | ........ | 178 | ........ | 1.38 | ........ | 7.3 | 10–36 |
| 35249 | Wilson clay loam, surface | .081 | .025 | 5 | .68 | .21 | 135 | .50 | .86 | .29 | 6.8 | 0–7 |
| 35250 | Wilson clay loam, subsoil | .053 | .022 | 26 | .68 | .23 | 132 | 1.62 | 1.85 | .39 | 7.2 | 7–24 |
| 35251 | Wilson clay loam, deep subsoil | .072 | .022 | 2 | 1.48 | .39 | 154 | .36 | .70 | .44 | 6.3 | 24–36 |

**Table 10. Analyses of soils of Falls County (continued)**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35606 | Wilson clay loam, surface.... | .108 | .035 | 34 | ........ | ........ | 165 | ........ | .62 | ........ | 6.7 | 0–10 |
| 35608 | Wilson clay loam, subsoil.... | .042 | .020 | 8 | .61 | ........ | 110 | ........ | .75 | ........ | 7.0 | 10–36 |
| Average | Wilson clay loam, surface.... | .088 | .031 | 33 | .68 | .21 | 179 | .50 | .97 | .29 | 7.0 | ........ |
| Average | Wilson clay loam, subsoil.... | .046 | .020 | 19 | .64 | .23 | 140 | 1.62 | 1.33 | .39 | 7.2 | ........ |
| Average | Wilson clay loam, deep subsoil.................... | .072 | .022 | 2 | 1.48 | .39 | 154 | .36 | .70 | .44 | 6.3 | ........ |
| 35658 | Wilson fine sandy loam, surface.................... | .078 | .025 | 24 | 1.30 | ........ | 148 | ........ | .92 | ........ | 7.6 | 0–10 |
| 35659 | Wilson fine sandy loam, subsoil.................... | .049 | .030 | 68 | 1.32 | ........ | 162 | ........ | 3.18 | ........ | 7.6 | 10–36 |
| 35574 | Wilson fine sandy loam, surface.................... | .041 | .015 | 26 | .85 | .09 | 66 | .21 | .20 | .07 | 7.8 | 0–12 |
| 35575 | Wilson fine sandy loam, subsoil.................... | .040 | .022 | 5 | .97 | .40 | 126 | .42 | .70 | .34 | 5.4 | 12–20 |
| 35576 | Wilson fine sandy loam, deep subsoil.................... | .036 | .019 | 5 | 1.06 | .30 | 105 | .41 | .71 | .31 | 5.5 | 20–36 |
| Average | Wilson fine sandy loam, surface.................... | .060 | .020 | 25 | 1.08 | .09 | 107 | .21 | .56 | .07 | 7.7 | ........ |
| Average | Wilson fine sandy loam, subsoil.................... | .045 | .026 | 37 | 1.15 | .40 | 244 | .42 | 1.94 | .34 | 6.5 | ........ |
| Average | Wilson fine sandy loam, deep subsoil.................... | .036 | .019 | 5 | 1.06 | .30 | 105 | .41 | .71 | .31 | 5.5 | ........ |
| 35624 | Yahola clay, surface........ | .123 | .160 | 199 | 2.76 | ........ | 471 | ........ | 11.70 | ........ | 7.8 | 0–7 |
| 35625 | Yahola clay, subsoil........ | .081 | .133 | 232 | 2.80 | ........ | 377 | ........ | 11.00 | ........ | 7.9 | 7–20 |
| 35626 | Yahola clay, deep subsoil.... | .058 | .105 | 56 | 1.95 | ........ | 132 | ........ | 14.70 | ........ | 8.2 | 20–36 |
| 35577 | Yahola fine sandy loam, surface.................... | .164 | .151 | 333 | 1.99 | .93 | 770 | 7.26 | 13.40 | 1.92 | 8.0 | 0–18 |
| 35578 | Yahola fine sandy loam, subsoil.................... | .060 | .094 | 102 | 1.88 | .52 | 329 | 6.42 | 12.53 | 1.69 | 8.3 | 18–36 |

**Table 11. Grades of constituents of surface soils of Falls County**

| Laboratory Number | Soil type | Nitrogen | Total Phos. Acid | Active Phos. Acid | Total Potash | Acid-Soluble Potash | Active Potash | Acid-Soluble Lime | Basicity | Acid-Soluble Magnesia | pH |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | Bell clay | 3 | 3 | 4 | 3 | 2 | 2 | 1 | 1 | 1 | 1 |
| Average | Catalpa clay | 2 | 2 | 5 | 3 | 2 | 2 | 1 | 1 | 1 | 1 |
| 35617 | Catalpa clay loam | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 1 |
| 35609 | Crockett clay loam | 3 | 4 | 5 | 2 | 2 | 2 | 2 | 3 | 1 | 2 |
| Average | Crockett fine sandy loam | 3 | 4 | 5 | 2 | 4 | 3 | 3 | 5 | 3 | 2 |
| Average | Falls fine sandy loam | 4 | 5 | 5 | 3 | 3 | 3 | 4 | 4 | 3 | 2 |
| Average | Houston black clay | 3 | 3 | 4 | 3 | 2 | 2 | 1 | 1 | 1 | 1 |
| Average | Houston clay | 2 | 2 | 4 | 3 | 3 | 2 | 1 | 1 | 1 | 1 |
| Average | Irving clay loam | 3 | 4 | 4 | 4 | 3 | 3 | 2 | 2 | 2 | 1 |
| 35630 | Irving fine sandy loam | 3 | 5 | 5 | 4 | 5 | 3 | 2 | 4 | 3 | 1 |
| Average | Leaf fine sandy loam | 4 | 5 | 5 | 3 | 4 | 3 | 3 | 5 | 4 | 2 |
| 35581 | Lewisville clay | 3 | 1 | 5 | 3 | 2 | 4 | 1 | 1 | 1 | 1 |
| Average | Milam fine sandy loam | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 1 |
| 35622 | Miller clay | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Average | Norfolk fine sand | 4 | 5 | 5 | 3 | 5 | 4 | 5 | 5 | 5 | 2 |
| 35611 | Ochlockonee fine sandy loam | 4 | 4 | 5 | 2 | 4 | 3 | 3 | 5 | 3 | 2 |
| 35586 | Pledger clay | 2 | 2 | 2 | 1 | ........ | 1 | ........ | 1 | ........ | 1 |
| 35619 | Reisel fine sandy loam | 3 | 4 | 5 | 4 | 3 | 3 | 2 | 3 | 3 | 2 |
| Average | Sumter clay | 3 | 3 | 4 | 2 | 2 | 3 | 1 | 1 | 1 | 1 |
| Average | Susquehanna fine sandy loam | 4 | 5 | 5 | 3 | 5 | 3 | 5 | 4 | 5 | 2 |
| 35572 | Tabor fine sandy loam | 5 | 5 | 5 | 3 | ........ | 4 | ........ | 5 | ........ | 2 |
| 35615 | Trinity clay | 2 | 2 | 4 | 2 | ........ | 2 | ........ | 1 | ........ | 1 |
| 35646 | Wilson clay | 3 | 4 | 4 | 3 | ........ | 2 | ........ | 3 | ........ | 2 |
| Average | Wilson clay loam | 3 | 4 | 4 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |
| Average | Wilson fine sandy loam | 4 | 5 | 5 | 3 | 5 | 3 | 3 | 4 | 5 | 1 |
| 35624 | Yahola clay | 2 | 1 | 3 | ........ | ........ | 1 | ........ | 1 | ........ | 1 |
| 35577 | Yahola fine sandy loam | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

**Table 12. Pot experiments on soils of Falls County**

| Laboratory Number | Soil type and crop | Weight of crop in grams | | | | Corn possibility of plant food withdrawn, in bushels | | |
|---|---|---|---|---|---|---|---|---|
| | | With complete fertilizer | Without phosphoric acid | Without nitrogen | Without potash | Phosphoric acid | Nitrogen | Potash |
| 35175 | Bell clay, subsoil, corn | 39.0 | 4.2 | 9.8 | ......... | 5 | 12 | ......... |
| 35175 | Bell clay, subsoil, sorghum | 40.2 | 6.5 | 8.2 | ......... | 6 | 12 | ......... |
| 35175 | Bell clay, subsoil, sudan | 36.8 | 3.1 | 4.8 | ......... | 3 | 6 | ......... |
| 35174 | Catalpa clay, subsoil, corn | ......... | 31.7 | ......... | ......... | 51 | ......... | ......... |
| 35189 | Catalpa clay, surface, corn | 42.7 | 40.7 | 30.0 | ......... | 74 | 45 | ......... |
| 35189 | Catalpa clay, surface, sorghum | 47.4 | 45.5 | 11.5 | ......... | 82 | 20 | ......... |
| 35189 | Catalpa clay, surface, sudan | 38.6 | 37.7 | 28.0 | ......... | 54 | 31 | ......... |
| 35173 | Crockett fine sandy loam, subsoil, sorghum | ......... | ......... | 7.9 | ......... | ......... | 12 | ......... |
| 35173 | Crockett fine sandy loam, subsoil, corn | ......... | ......... | 3.2 | ......... | ......... | 10 | ......... |
| 35171 | Falls fine sandy loam, subsoil, sudan | ......... | 3.3 | ......... | ......... | 3 | ......... | ......... |
| 35167 | Falls fine sandy loam, surface, sorghum | ......... | 12.9 | 11.5 | 25.4 | 15 | 25 | 87 |
| 35167 | Falls fine sandy loam, surface, corn | ......... | 8.8 | 7.7 | 41.2 | 11 | 8 | 202 |
| 35178 | Falls fine sandy loam, subsoil, wheat | ......... | 1.9 | .8 | ......... | ......... | 5 | ......... |
| 35178 | Falls fine sandy loam, subsoil, sorghum | ......... | 6.5 | 12.6 | ......... | 6 | 28 | ......... |
| 35176 | Houston black clay, subsoil, sorghum | 33.5 | 11.8 | 19.7 | ......... | 13 | 25 | ......... |
| 35176 | Houston black clay, subsoil, corn | 17.2 | 3.8 | 10.2 | ......... | 6 | 18 | ......... |
| 35176 | Houston black clay, subsoil, sudan | 36.6 | 5.3 | 15.3 | ......... | 4 | 14 | ......... |
| 35180 | Houston black clay, surface, sorghum | 38.0 | 17.0 | 18.2 | ......... | 18 | 36 | ......... |
| 35180 | Houston black clay, surface, corn | 42.0 | 11.0 | 16.2 | ......... | 15 | 23 | ......... |
| 35180 | Houston black clay, surface, sudan | 39.0 | 8.3 | 12.8 | ......... | 8 | 20 | ......... |
| 35182 | Houston black clay, subsoil, corn | 33.3 | 5.1 | 12.5 | ......... | 6 | 18 | ......... |
| 35182 | Houston black clay, subsoil, sorghum | 36.9 | 11.3 | 9.7 | ......... | 9 | 14 | ......... |
| 35182 | Houston black clay, subsoil, sudan | 32.7 | 4.9 | 10.4 | ......... | 5 | 12 | ......... |
| 35184 | Houston black clay, subsoil, wheat | ......... | 4.5 | 5.1 | ......... | 6 | 11 | ......... |
| 35188 | Houston black clay, surface, rape | ......... | 8.2 | 10.5 | ......... | 17 | 52 | ......... |
| 35188 | Houston black clay, surface, tobacco | ......... | 1.0 | 7.9 | ......... | 3 | 30 | ......... |
| 35190 | Houston black clay, subsoil, corn | 30.8 | 5.2 | 12.8 | ......... | 6 | 18 | ......... |
| 35190 | Houston black clay, subsoil, sorghum | 33.0 | 7.5 | 8.0 | ......... | 7 | 12 | ......... |
| 35190 | Houston black clay, subsoil, sudan | 34.0 | 3.3 | 15.2 | ......... | 3 | 18 | ......... |
| 5100 | Leaf fine sandy loam, probably, surface, corn | 51.4 | 48.7 | ......... | ......... | 65 | ......... | ......... |
| 5100 | Leaf fine sandy loam, probably, surface, corn | 48.9 | 31.8 | ......... | ......... | 28 | ......... | ......... |
| 5100 | Leaf fine sandy loam, probably, surface, corn | 49.9 | ......... | ......... | 50.2 | ......... | ......... | 281 |
| 5100 | Leaf fine sandy loam, probably, surface, sorghum | 31.7 | 30.2 | ......... | ......... | 35 | ......... | ......... |
| 5100 | Leaf fine sandy loam, probably, surface, sorghum | 17.4 | 9.7 | ......... | ......... | 12 | ......... | ......... |
| 5100 | Leaf fine sandy loam, probably, surface, sorghum | 26.5 | ......... | ......... | 29.7 | ......... | ......... | 84 |
| 5100 | Leaf fine sandy loam, probably, surface, cotton | 37.1 | ......... | ......... | 31.5 | ......... | ......... | 262 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 35181 | Leaf fine sandy loam, surface, corn | 43.4 | 17.1 | 11.6 | .......... | 22 | 16 | .......... |
| 35181 | Leaf fine sandy loam, surface, sorghum | 30.4 | 21.8 | 14.2 | .......... | 22 | 23 | .......... |
| 35181 | Leaf fine sandy loam, surface, oats | 12.1 | 11.5 | 8.5 | .......... | 14 | 22 | .......... |
| 35185 | Leaf fine sandy loam, subsoil, corn | .......... | 4.4 | .......... | .......... | 6 | .......... | .......... |
| 35187 | Leaf fine sandy loam, subsoil, sorghum | .......... | 8.7 | 4.9 | .......... | 9 | 12 | .......... |
| 35187 | Leaf fine sandy loam, subsoil, corn | .......... | 5.3 | 6.4 | .......... | 7 | 8 | .......... |
| 35168 | Norfolk fine sand, subsoil, sudan | .......... | 2.7 | 4.0 | 13.0 | 3 | 5 | .......... |
| 35169 | Norfolk fine sand, surface, sudan | .......... | .......... | 9.9 | .......... | .......... | 11 | .......... |
| 35179 | Sumter clay, surface, tobacco | .......... | 4.3 | 4.5 | .......... | 6 | 16 | .......... |
| 35183 | Sumter clay, subsoil, corn | 28.5 | 4.0 | 6.0 | .......... | 5 | 8 | .......... |
| 35183 | Sumter clay, subsoil, sorghum | 22.5 | 5.7 | 6.6 | .......... | 5 | 9 | .......... |
| 35183 | Sumter clay, subsoil, sudan | 30.5 | 1.7 | 2.9 | .......... | 2 | 3 | .......... |
| 35172 | Susquehanna fine sandy loam, surface, sudan | .......... | 10.0 | 5.8 | .......... | 10 | 8 | .......... |
| 35249 | Wilson clay loam, surface, sorghum | 32.0 | 21.5 | 12.4 | .......... | 22 | 23 | .......... |
| 35249 | Wilson clay loam, surface, corn | 49.8 | 21.4 | 18.5 | .......... | 35 | .......... | 167 |
| 35249 | Wilson clay loam, surface, sudan | 30.3 | 23.3 | 11.2 | .......... | 21 | 16 | .......... |
| 35250 | Wilson clay loam, subsoil, sorghum | .......... | 3.0 | 6.2 | 4.6 | .......... | 14 | 22 |
| 35250 | Wilson clay loam, subsoil, corn | .......... | 4.7 | 11.4 | 12.0 | 8 | 21 | 110 |
| 35251 | Wilson clay loam, subsoil, corn | .......... | .......... | 19.8 | .......... | .......... | 30 | .......... |

## Soils of Hardeman County

Hardeman County comprises an area of 693 square miles in northern Texas on the Rolling Plains. Thirty-three types and phases of soils in 13 series were mapped. The most extensive soil type is the Tillman clay loam, which occupies 11.5 per cent of the area, although the largest single classification within the county is rough and broken land in the southern part, covering 12.8 per cent of the county. Upland soils include the red soils of the Tillman, Miles, Enterprise, Vernon, and Weymouth series (58.2 per cent of area) and the dark soils of the Hollister, Abilene, and Acme series (17.4 per cent of area). Stream-bottom soils include the Miller, Yahola, Spur, and Tipton series (5.8 per cent of area).

### Description of soils

**Upland Soils:**

**Abilene soils**—Dark-brown to very dark brown, friable topsoil underlain by a very friable and granular, very dark-brown or nearly black, heavy subsoil grading into a friable, brown or grayish-brown, calcareous, heavy, deep subsoil. Covers 7.5 per cent of area.

**Acme soils**—Very thin, very dark brown, friable, platy, calcareous, topsoil underlain by calcareous, very friable and granular, nearly black, clay subsoil, grading into a dark-brown, friable, massive, cloddy, clay deep subsoil, which at a depth ranging from 30 to 40 inches is abruptly underlain by glistening white or nearly white pure gypsum. Covers 1.1 per cent of area.

**Enterprise soils**—Brownish-red to brown, faintly calcareous topsoil which becomes more calcareous and slightly lighter colored in the subsoil and a deep subsoil of calcareous, mellow, yellowish-red, loamy, fine sand containing a few fine white threads of lime, which continues downward for many feet without change. Covers 12.2 per cent of area.

**Hollister soils**—Very dark, grayish-brown, friable, platy surface to a depth of 1 or 2 inches, underlain by nearly black, moderately granular and friable subsoil below which is a very compact and tight, clay deep subsoil, under which is a zone of calcium carbonate accumulation. Covers 8.8 per cent of area.

**Miles soils**—Dark-brown, friable, platy 1- or 2-inch surface layer underlain by dark reddish-brown, friable, granular, heavy subsoil, which becomes less dark until it grades into light reddish-brown or brownish-red friable, clay, deep subsoil. Covers 16.3 per cent of area.

**Tillman soils**—Dark reddish-brown, friable surface layer 1 to 2 inches deep, underlain by dark reddish-brown, friable, granular clay, which with increase in depth becomes more compact and less dark; below a depth of about 12 inches the soil material is reddish-brown, tight, compact clay. Covers 11.5 per cent of area.

**Vernon soils**—Reddish-brown or brownish-red, calcareous, compact topsoil which grades into red, very compact, calcareous, clay subsoil containing a few white spots or concretions of calcium carbonate, which extends downward for about 30 inches. Covers 11.9 per cent of area.

**Weymouth soils**—Brownish-red, friable, granular, calcareous topsoil overlying a light-colored layer of soil material consisting of a mixture of light-brown, clay loam and white calcium carbonate. Covers 12.0 per cent of area.

**Stream-bottom Soils:**

**Yahola soils**—Brownish-red or yellowish-red, calcareous topsoil, extremely variable, and underlain by sand or by thin strata of clay at various depths. Covers .4 per cent of area.

**Composition of soils**—Table 13 gives the analyses of the different soil types and Table 14 the grades of constituents of the surface soils. The soils are probably deficient to moderate in nitrogen and total phosphoric acid (Grades 3 and 4). They are slightly better in active phosphoric acid (mainly Grades 2 and 3). With a very few exceptions, the soils are well supplied with potash. Most of the soils are moderate to high (Grades 1, 2, 3) in acid-soluble lime, acid-soluble magnesia, and basicity, and are neutral to alkaline in pH (Grades 1 and 2).

**Pot experiments**—Results of pot experiments are given in Table 15. All of the soils used in pot work responded markedly to additions of nitrogen and phosphoric acid, but did not respond to the addition of potash. The corn possibility of the plant food withdrawn shows a deficiency of nitrogen and phosphoric acid, but a very large amount of available potash.

**Fertilizers**—The need of most of the soils for fertilizers carrying nitrogen and phosphoric acid is indicated. Potash fertilizers and lime are not needed except possibly on small areas or for special crops.

## Soils of Polk County

Polk County comprises an area of 1,006 square miles in east-central Texas, and lies entirely within the geographical region of the East Texas Timber Country, although a few isolated prairies of the noncalcareous Wilson-Crockett soil group of the Blackland Prairies account for 6.4 per cent of the area. Twenty-seven soil types in 14 series were mapped. The most extensive soil type of the area is the Susquehanna fine sandy loam, which covers 24.2 per cent of the area, followed by Segno fine sandy loam (17.8 per cent) and Lufkin fine sandy loam (15.3 per cent). Upland soils of the East Texas Timber Country include soils with friable subsoils of the Segno, Caddo, Ruston, and Kalmia series (40.6 per cent of the area) and those with dense and heavy subsoils of the Susquehanna, Leaf, Myatt, and Lufkin series (42.8 per cent of the area). Upland soils

**Table 13. Analyses of soils of Hardeman County**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 37284 | Abilene clay loam, surface | .097 | .074 | 252 | 1.82 | .78 | 625 | .64 | 1.00 | .74 | 8.0 | 0–7 |
| 37285 | Abilene clay loam, subsoil | .075 | .064 | 146 | 1.74 | .69 | 294 | 1.28 | 2.10 | .71 | 8.2 | 7–19 |
| 37314 | Abilene clay loam, deep subsoil | .054 | .072 | 223 | 1.77 | ........ | 271 | ........ | 7.12 | ........ | 8.3 | 19–31 |
| 17248 | Abilene fine sandy loam, surface | .042 | .047 | 88 | 1.62 | .25 | 309 | .26 | .65 | .22 | 7.3 | 0–12 |
| 17249 | Abilene fine sandy loam, subsoil | .056 | .063 | 85 | 1.36 | .38 | 367 | .30 | .80 | .28 | 7.2 | 12–36 |
| 17307 | Abilene fine sandy loam, surface | .058 | .080 | 114 | ........ | .33 | 279 | 2.42 | 3.75 | .46 | 7.6 | 0–7 |
| 17308 | Abilene fine sandy loam, subsoil | .056 | .064 | 79 | ........ | .31 | 176 | 4.56 | 7.25 | .49 | 7.7 | 7–20 |
| 17309 | Abilene fine sandy loam, deep subsoil | .045 | .045 | 5 | ........ | .29 | 56 | 9.36 | ........ | .54 | 7.8 | 20–36 |
| 37304 | Abilene fine sandy loam, surface | .095 | .039 | 78 | 1.80 | ........ | 989 | ........ | .45 | ........ | 6.1 | 0–7 |
| 37305 | Abilene fine sandy loam, subsoil | .046 | .030 | 19 | 1.48 | ........ | 218 | ........ | .62 | ........ | 7.1 | 7–19 |
| 37306 | Abilene fine sandy loam, deep subsoil | .040 | .028 | 10 | 1.48 | ........ | 227 | ........ | .76 | ........ | 7.3 | 19–31 |
| Average | Abilene fine sandy loam, surface | .065 | .055 | 93 | 1.71 | .29 | 526 | 1.34 | 1.62 | .34 | 7.0 | ........ |
| Average | Abilene fine sandy loam, subsoil | .053 | .052 | 61 | 1.42 | .35 | 254 | 2.43 | 2.89 | .39 | 7.4 | ........ |
| Average | Abilene fine sandy loam, deep subsoil | .043 | .037 | 8 | 1.48 | .29 | 142 | 9.36 | .38 | .54 | 7.5 | ........ |
| 17258 | Abilene loam, surface | .073 | .070 | 115 | .97 | ........ | 475 | .28 | .65 | .39 | 7.0 | 0–7 |
| 17259 | Abilene loam, subsoil | .061 | .065 | 61 | 1.83 | .52 | 342 | .38 | .75 | .49 | 6.9 | 7–20 |
| 17260 | Abilene loam, deep subsoil | .054 | .070 | 37 | 1.96 | .58 | 317 | .43 | .90 | .55 | 7.0 | 20–36 |
| 17286 | Abilene loam, surface | .058 | .051 | 86 | 1.21 | .41 | 396 | .35 | .35 | .40 | 6.9 | 0–10 |
| 17287 | Abilene loam, subsoil | .056 | .042 | 44 | .86 | .52 | 265 | .42 | .40 | .47 | 7.1 | 10–24 |
| 17288 | Abilene loam, deep subscil | .041 | .044 | 62 | ........ | .58 | 222 | .57 | .65 | .67 | 7.2 | 24–36 |
| 17313 | Abilene loam, surface | .081 | .081 | 164 | ........ | .34 | 221 | 4.84 | 2.00 | .56 | 7.6 | 0–10 |
| 17314 | Abilene loam, subsoil | .064 | .058 | 9 | ........ | .35 | 69 | 11.50 | 10+ | .52 | 7.7 | 10–20 |
| 17315 | Abilene loam, deep subsoil | .044 | .070 | 6 | ........ | .27 | 37 | 17.92 | 10+ | .62 | 7.8 | 20–36 |
| Average | Abilene loam, surface | .071 | .067 | 122 | 1.09 | .38 | 364 | 1.82 | 1.00 | .45 | 7.2 | ........ |
| Average | Abilene loam, subsoil | .060 | .055 | 38 | 1.35 | .46 | 225 | 4.10 | .38 | .49 | 7.2 | ........ |
| Average | Abilene loam, deep subsoil | .046 | .061 | 35 | 1.96 | .48 | 192 | 6.31 | .52 | .61 | 7.3 | ........ |
| 37310 | Acme clay loam, surface | .127 | .111 | 498 | 2.20 | ........ | 404 | ........ | 4.85 | ........ | 8.3 | 0–7 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 37311 | Acme clay loam, subsoil | .102 | .119 | 469 | 2.07 | ........ | 198 | ........ | 7.82 | ........ | 8.0 | 7–19 |
| 37312 | Acme clay loam, deep subsoil | .084 | .121 | 44 | 2.02 | ........ | 50 | ........ | 4.55 | ........ | 8.2 | 19–31 |
| 37317 | Enterprise loamy fine sand, surface | .031 | .071 | 320 | 1.78 | ........ | 148 | ........ | 1.07 | ........ | 8.6 | 0–7 |
| 37318 | Enterprise loamy fine sand, subsoil | .030 | .074 | 78 | 1.74 | ........ | 102 | ........ | 1.19 | ........ | 8.5 | 7–19 |
| 17265 | Hollister clay, surface | .075 | .107 | 267 | ........ | .74 | 438 | .82 | ........ | .78 | 7.2 | 0–21 |
| 17266 | Hollister clay, subsoil | .053 | .114 | 614 | ........ | .72 | 324 | 2.38 | 4.35 | .84 | 7.7 | 21–36 |
| 17269 | Hollister clay, surface | .079 | .097 | 203 | ........ | 1.02 | 507 | .62 | 1.90 | 1.16 | 7.1 | 0–20 |
| 17270 | Hollister clay, subsoil | .061 | .083 | 335 | ........ | .92 | 410 | 1.37 | 3.50 | .61 | 7.5 | 20–36 |
| 37288 | Hollister clay, surface | .084 | .063 | 160 | 2.48 | 1.31 | 511 | .92 | 1.80 | 1.25 | 8.1 | 0–7 |
| 37289 | Hollister clay, subsoil | .059 | .059 | 162 | 2.44 | 1.27 | 410 | 1.78 | 2.95 | 1.35 | 8.3 | 7–19 |
| 37313 | Hollister clay, deep subsoil | .053 | .054 | 164 | 2.30 | ........ | 309 | ........ | 5.90 | ........ | 7.9 | 19–31 |
| Average | Hollister clay, surface | .079 | .089 | 210 | 2.48 | 1.02 | 485 | .79 | 1.85 | 1.06 | 7.5 | ........ |
| Average | Hollister clay, subsoil | .058 | .085 | 370 | 2.44 | .97 | 381 | 1.84 | 3.60 | .93 | 7.8 | ........ |
| Average | Hollister clay, deep subsoil | .053 | .054 | 164 | 2.30 | ........ | 309 | ........ | 5.90 | ........ | 7.8 | ........ |
| 17283 | Hollister clay loam, surface | .081 | .051 | 149 | ........ | .53 | 395 | .50 | .65 | .28 | 7.0 | 0–10 |
| 17284 | Hollister clay loam, subsoil | .079 | .068 | 99 | ........ | .61 | 329 | .66 | .95 | .15 | 7.3 | 10–20 |
| 17285 | Hollister clay loam, deep subsoil | .058 | .073 | 140 | ........ | .70 | 251 | 4.20 | 6.45 | .80 | 7.6 | 20–36 |
| 17289 | Hollister clay loam, surface | .085 | .060 | 167 | ........ | .53 | 414 | .61 | .90 | .53 | 7.1 | 0–7 |
| 17290 | Hollister clay loam, subsoil | .080 | .067 | 214 | ........ | .62 | 349 | 1.26 | 2.35 | .42 | 7.4 | 7–20 |
| 17291 | Hollister clay loam, deep subsoil | .052 | .080 | 368 | ........ | .59 | 208 | 4.50 | 7.35 | .55 | 7.6 | 20–36 |
| 17316 | Hollister clay loam, surface | .121 | .100 | 186 | ........ | .94 | 576 | .87 | 5.00 | 1.09 | 7.3 | 0–4 |
| 17317 | Hollister clay loam, subsoil | .071 | .095 | 204 | ........ | .91 | 381 | 2.09 | 3.90 | 1.12 | 7.5 | 4–24 |
| 17318 | Hollister clay loam, deep subsoil | .049 | .067 | 213 | ........ | .91 | 377 | 2.55 | 5.25 | 1.42 | ........ | 24–36 |
| 37282 | Hollister clay loam, surface | .142 | .106 | 366 | 2.44 | 1.17 | 629 | 1.02 | 1.96 | 1.20 | 8.0 | 0–7 |
| 37283 | Hollister clay loam, subsoil | .090 | .097 | 362 | 2.18 | 1.11 | 555 | 2.75 | 4.99 | 1.41 | 8.2 | 7–19 |
| 37315 | Hollister clay loam, deep subsoil | .069 | .078 | 193 | 2.43 | ........ | 436 | ........ | 1.62 | ........ | 7.9 | 19–31 |
| Average | Hollister clay loam, surface | .107 | .079 | 217 | 2.44 | .79 | 504 | .75 | 2.13 | .78 | 7.3 | ........ |
| Average | Hollister clay loam, subsoil | .080 | .082 | 220 | 2.18 | .81 | 404 | 1.69 | 3.05 | .78 | 7.6 | ........ |
| Average | Hollister clay loam, deep subsoil | .057 | .075 | 229 | 2.43 | .73 | 318 | 3.75 | 5.17 | .92 | 7.7 | ........ |
| 37290 | Miles clay loam, surface | .136 | .089 | 305 | 2.44 | .84 | 412 | 2.30 | 4.24 | 1.20 | 8.2 | 0–7 |
| 37291 | Miles clay loam, subsoil | .093 | .079 | 245 | 2.35 | .84 | 337 | 3.73 | 6.60 | 1.56 | 8.3 | 7–19 |
| 37320 | Miles clay loam, deep subsoil | .067 | .059 | 78 | 2.17 | ........ | 184 | ........ | 6.40 | ........ | 8.2 | 19–31 |
| 37292 | Miles fine sand, surface | .069 | .034 | 64 | 1.42 | .18 | 269 | .18 | .10 | .25 | 7.8 | 0–7 |
| 37293 | Miles fine sand, subsoil | .024 | .021 | 31 | 1.19 | .14 | 90 | .10 | .07 | .19 | 7.9 | 7–17 |
| 37294 | Miles fine sand, deep subsoil | .034 | .029 | 9 | 1.38 | .35 | 139 | .21 | .10 | .24 | 6.8 | 19–31 |
| 17298 | Miles fine sandy loam, surface | .073 | .067 | 217 | ........ | .29 | 759 | .26 | .15 | .26 | 7.0 | 0–6 |
| 17299 | Miles fine sandy loam, subsoil | .069 | .057 | 7 | ........ | .68 | 903 | .42 | .45 | .47 | 6.9 | 6–22 |
| 17300 | Miles fine sandy loam, deep subsoil | .056 | .048 | 7 | ........ | .66 | 504 | .49 | .70 | .61 | 7.0 | 22–36 |
| 37295 | Miles fine sandy loam, surface | .080 | .054 | 128 | 1.94 | .50 | 517 | .32 | .48 | .44 | 7.6 | 0–7 |
| 37296 | Miles fine sandy loam, subsoil | .068 | .047 | 55 | 1.88 | .59 | 341 | .41 | .65 | .54 | 7.3 | 7–19 |
| 37316 | Miles fine sandy loam, deep subsoil | .047 | .038 | 40 | 1.86 | ........ | 229 | ........ | .62 | ........ | 7.4 | 19–31 |
| Average | Miles fine sandy loam, surface | .077 | .061 | 173 | 1.94 | .40 | 638 | .29 | .32 | .35 | 7.3 | 0–10 |
| Average | Miles fine sandy loam, subsoil | .069 | .052 | 31 | 1.88 | .64 | 622 | .42 | .55 | .51 | 7.1 | ........ |

**Table 13. Analyses of soils of Hardeman County (continued)**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | Miles fine sandy loam, deep subsoil | .052 | .043 | 24 | 1.86 | .66 | 367 | .49 | .66 | .61 | 7.2 | ........ |
| 17263 | Miles loamy fine sand, surface | .035 | .045 | 66 | .73 | .15 | 170 | .17 | .40 | .22 | 6.5 | 0–10 |
| 17264 | Miles loamy fine sand, subsoil | .036 | .046 | 32 | 1.85 | .25 | 147 | .20 | .50 | .32 | 6.7 | 10–36 |
| 37301 | Miles loamy fine sand, surface | .052 | .034 | 78 | 1.66 | ........ | 186 | ........ | .37 | ........ | 7.7 | 0–7 |
| 37302 | Miles loamy fine sand, subsoil | .041 | .025 | 44 | 1.55 | ........ | 151 | ........ | .35 | ........ | 7.7 | 7–19 |
| 37303 | Miles loamy fine sand, deep subsoil | .036 | .026 | 35 | 1.50 | ........ | 149 | ........ | .45 | ........ | 7.5 | 19–31 |
| Average | Miles loamy fine sand, surface | .044 | .040 | 72 | 1.20 | .15 | 178 | .17 | .39 | .22 | 7.1 | ........ |
| Average | Miles loamy fine sand, subsoil | .039 | .036 | 38 | 1.70 | .25 | 149 | .20 | .43 | .32 | 7.2 | ........ |
| Average | Miles loamy fine sand, deep subsoil | .036 | .026 | 35 | 1.50 | ........ | 149 | ........ | .45 | ........ | 7.5 | ........ |
| 37286 | Tillman clay loam, surface | .109 | .065 | 128 | 2.34 | .93 | 465 | .52 | .98 | .80 | 7.8 | 0–7 |
| 37287 | Tillman clay loam, subsoil | .084 | .059 | 122 | 2.20 | 1.18 | 423 | .58 | 1.09 | 1.03 | 7.8 | 7–19 |
| 37319 | Tillman clay loam, deep subsoil | .052 | .061 | 325 | 2.32 | ........ | 144 | ........ | 6.92 | ........ | 8.1 | 22–31 |
| 7246 | Vernon clay, surface | .087 | .074 | 141 | ........ | .65 | 513 | .28 | .81 | .17 | 7.1 | 0–10 |
| 7247 | Vernon clay, subsoil | .080 | .055 | 74 | ........ | .80 | 381 | .47 | .63 | .28 | 7.4 | 10–22 |
| 17274 | Vernon clay loam, surface | .071 | .066 | 159 | ........ | .49 | 370 | 1.43 | 2.95 | .28 | 7.4 | 0–10 |
| 17275 | Vernon clay loam, subsoil | .051 | .070 | 132 | ........ | .48 | 181 | 2.75 | .40 | .28 | 7.5 | 10–26 |
| 17276 | Vernon clay loam, deep subsoil | .044 | .078 | 76 | ........ | .58 | 190 | 2.98 | .65 | .43 | 7.6 | 26–36 |
| 37297 | Vernon clay loam, surface | .074 | .052 | 55 | 2.26 | 1.27 | 217 | 5.27 | 7.62 | 1.71 | 8.5 | 0–7 |
| 37298 | Vernon clay loam, subsoil | .054 | .065 | 33 | 2.26 | 1.40 | 13 | 10.04 | 19.45 | 2.33 | 8.4 | 7–19 |
| Average | Vernon clay loam, surface | .073 | .059 | 107 | 2.26 | .88 | 294 | 3.35 | 5.29 | 1.00 | 8.0 | ........ |
| Average | Vernon clay loam, subsoil | .053 | .068 | 83 | 2.26 | .94 | 97 | 6.40 | 9.92 | 1.31 | 8.0 | ........ |
| Average | Vernon clay loam, deep subsoil | .044 | .078 | 76 | ........ | .58 | 190 | 2.98 | .65 | .43 | 7.6 | ........ |
| 15014 | Vernon loam, probably, surface | .076 | .071 | ........ | ........ | ........ | ........ | .68 | .59 | .45 | ........ | ........ |
| 37307 | Weymouth clay loam, surface | .154 | .075 | 175 | 2.14 | ........ | 497 | ........ | 3.09 | ........ | 8.0 | 0–7 |
| 37308 | Weymouth clay loam, subsoil | .123 | .070 | 99 | 2.02 | ........ | 65 | ........ | 7.38 | ........ | 8.1 | 7–12 |
| 37309 | Weymouth clay loam, deep subsoil | .057 | .069 | 7 | 1.30 | ........ | 17 | ........ | 46.30 | ........ | 8.3 | 12–19 |
| 37299 | Yahola loamy fine sand, surface | .023 | .058 | 296 | 1.86 | ........ | 34 | ........ | 8.70 | ........ | 8.3 | 0–7 |
| 37300 | Yahola loamy fine sand, subsoil | .056 | .074 | 222 | 1.84 | ........ | 138 | ........ | 11.20 | ........ | 9.0 | 7–19 |

**Table 14. Grades of constituents of surface soils of Hardeman County**

| Laboratory Number | Soil type | Nitrogen | Total Phos. Acid | Active Phos. Acid | Total Potash | Acid-Soluble Potash | Active Potash | Acid-Soluble Lime | Basicity | Acid-Soluble Magnesia | pH |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 37284 | Abilene clay loam | 3 | 3 | 2 | 1 | 2 | 1 | 2 | 3 | 1 | 1 |
| Average | Abilene fine sandy loam | 3 | 3 | 4 | 2 | 3 | 1 | 2 | 3 | 2 | 2 |
| Average | Abilene loam | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 |
| 37310 | Acme clay loam | 2 | 2 | 1 | 1 | ........ | 1 | ........ | 2 | ........ | 1 |
| 37317 | Enterprise loamy fine sand | 4 | 3 | 2 | 2 | ........ | 3 | ........ | 3 | ........ | 1 |
| Average | Hollister clay | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 3 | 1 | 2 |
| Average | Hollister clay loam | 3 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 2 |
| 37290 | Miles clay loam | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 37292 | Miles fine sand | 3 | 4 | 4 | 2 | 4 | 2 | 4 | 5 | 3 | 1 |
| Average | Miles fine sandy loam | 3 | 3 | 3 | 1 | 3 | 1 | 3 | 4 | 2 | 2 |
| Average | Miles loamy fine sand | 4 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 3 | 2 |
| 37286 | Tillman clay loam | 3 | 3 | 3 | 1 | 1 | 1 | 2 | 3 | 1 | 1 |
| 7246 | Vernon clay | 3 | 3 | 3 | ........ | 2 | 1 | 3 | 3 | 3 | 2 |
| Average | Vernon clay loam | 3 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| 15014 | Vernon loam | 3 | 3 | ........ | ........ | ........ | ........ | 2 | 4 | 2 | ........ |
| 37307 | Weymouth clay loam | 2 | 3 | 3 | 1 | ........ | 1 | ........ | 2 | ........ | 1 |
| 37299 | Yahola loamy fine sand | 5 | 3 | 2 | 1 | ........ | 5 | ........ | ........ | ........ | 1 |

**Table 15. Pot experiments on soils of Hardeman County**

| Laboratory Number | Soil type and crop | Weight of crop in grams | | | | Corn possibility of plant food withdrawn, in bushels | | |
|---|---|---|---|---|---|---|---|---|
| | | With complete fertilizer | Without phosphoric acid | Without nitrogen | Without potash | Phosphoric acid | Nitrogen | Potash |
| 37284 | Abilene clay loam, surface, kafir | 51.6 | 47.8 | 12.3 | 47.3 | 69 | 15 | 421 |
| 37284 | Abilene clay loam, surface, corn | 54.4 | 46.8 | 30.3 | 54.0 | 76 | 47 | 813 |
| 37285 | Abilene clay loam, subsoil, corn | 37.4 | 14.6 | 15.2 | 39.2 | 21 | 19 | 425 |
| 37285 | Abilene clay loam, subsoil, kafir | 44.0 | 16.7 | 5.2 | 45.7 | 14 | 8 | 302 |
| 37288 | Hollister clay, surface, corn | 39.3 | 18.7 | 19.1 | 35.2 | 27 | 30 | 553 |
| 37288 | Hollister clay, surface, kafir | 39.9 | 14.0 | 6.6 | 34.1 | 17 | 11 | 335 |
| 37289 | Hollister clay, subsoil, corn | 23.3 | 3.8 | 14.5 | 25.6 | 6 | 23 | 360 |
| 37289 | Hollister clay, subsoil, kafir | 32.2 | 15.2 | 3.5 | 30.6 | 17 | 7 | 317 |
| 37282 | Hollister clay, surface, corn | 57.5 | ......... | 30.0 | ......... | 10 | ......... | ......... |
| 37282 | Hollister clay, surface, kafir | 47.2 | ......... | 21.2 | ......... | ......... | 24 | ......... |
| 37283 | Hollister clay loam, subsoil, corn | 37.5 | ......... | 21.2 | ......... | ......... | 21 | ......... |
| 37283 | Hollister clay loam, subsoil, kafir | 34.5 | ......... | 6.0 | ......... | ......... | 10 | ......... |
| 37290 | Miles clay loam, surface, corn | 41.1 | 18.4 | 25.4 | 43.8 | 20 | 40 | 611 |
| 37290 | Miles clay loam, surface, kafir | 51.2 | 23.0 | 22.6 | 53.3 | 18 | 29 | 405 |
| 37291 | Miles clay loam, subsoil, corn | 34.8 | 3.9 | 18.8 | 29.3 | 5 | 33 | 329 |
| 37291 | Miles clay loam, subsoil, kafir | 44.7 | 9.5 | 8.5 | 43.8 | 9 | 11 | 295 |
| 37292 | Miles fine sand, surface, corn | ......... | 26.3 | 22.6 | ......... | 42 | 34 | ......... |
| 37292 | Miles fine sand, surface, kafir | ......... | 25.1 | 14.4 | ......... | 38 | 34 | ......... |
| 37293 | Miles fine sand, subsoil, corn | ......... | ......... | 26.2 | ......... | ......... | ......... | ......... |
| 37294 | Miles fine sand, subsoil, corn | ......... | 4.0 | ......... | ......... | 5 | ......... | ......... |
| 37294 | Miles fine sand, subsoil, kafir | ......... | 7.6 | ......... | ......... | 8 | ......... | ......... |
| 37295 | Miles fine sandy loam, surface, corn | 44.4 | 41.2 | 18.8 | 41.1 | 63 | 30 | 732 |
| 37295 | Miles fine sandy loam, surface, kafir | 35.3 | 31.6 | 9.3 | 36.5 | 66 | 27 | 320 |
| 37296 | Miles fine sandy loam, subsoil, corn | ......... | 6.5 | 17.3 | ......... | 9 | 19 | ......... |
| 37296 | Miles fine sandy loam, subsoil, kafir | ......... | 21.5 | 5.9 | ......... | 21 | 9 | ......... |
| 37286 | Tillman clay loam, surface, kafir | 53.5 | 37.8 | 20.9 | 57.2 | 33 | 24 | 424 |
| 37286 | Tillman clay loam, surface, corn | 56.1 | 38.0 | 23.4 | 59.0 | 44 | 29 | 657 |
| 37287 | Tillman clay loam, subsoil, corn | 43.8 | 6.1 | 17.6 | 45.2 | 8 | 22 | 612 |
| 37287 | Tillman clay loam, subsoil, kafir | 43.7 | 15.9 | 5.0 | 41.2 | 14 | 8 | 331 |
| 37297 | Vernon clay loam, surface, corn | 43.0 | 8.5 | 13.9 | 36.6 | 10 | 16 | 284 |
| 37297 | Vernon clay loam, surface, kafir | 31.5 | 11.6 | 4.7 | 34.8 | 11 | 9 | 213 |
| 37298 | Vernon clay loam, subsoil, corn | 21.0 | 3.5 | ......... | ......... | 4 | ......... | ......... |
| 37298 | Vernon clay loam, subsoil, kafir | 29.5 | 12.8 | ......... | ......... | 10 | ......... | ......... |

of the Blackland Prairie region include the noncalcareous soils of the Crockett, Wilson, and Garner series (6.4 per cent of the area). Stream-bottom soils include soils of the Bibb, Johnston, and Ochlockonee series (9.2 per cent of the area).

### Description of Soils

**Upland Soils:**

**Caddo soils**—Dark-gray, fine-sand topsoil grading into yellow or gray, fine-sand subsoil which in places is faintly mottled with brown and contains a few black or brown concretions and at a depth of 12 to 18 inches grades into mottled yellow and gray friable, fine-sandy clay. Covers 6.4 per cent of area.

**Crockett soils**—Dark-gray or nearly black topsoil which grades into heavy gray clay subsoil containing red and yellow streaks or spots; in places, the subsoil has a preponderance of red and in other places yellow and gray are preponderant. Covers 2.3 per cent of area.

**Garner soils**—Gray, dark-gray, or brown, heavy topsoil underlain by gray and mottled clay subsoil which passes into gray, waxy clay containing brown spots and a few black concretions. Covers 1.6 per cent of area.

**Lufkin soils**—Gray, sandy topsoil resting on a heavy, gray clay subsoil of a putty-like consistency. Covers 16.6 per cent of area.

**Ruston soils**—Light-brown or grayish-brown topsoil which grades into brown, reddish-brown, or reddish-yellow subsoil which passes into a reddish-yellow or reddish-brown deep subsoil. Covers 1.0 per cent of area.

**Segno soils**—Gray or light-brown very slightly coherent topsoil which grades into yellow, friable subsoil and this in turn into yellow, friable deep subsoil splotched with red or red and gray streaks extending throughout the yellow mass color. Covers 31.2 per cent of area.

**Susquehanna soils**—Gray or light brown topsoil passing into light-gray or yellow subsoil which rests on a dense, heavy, plastic, red and gray mottled deep subsoil having some yellow streaks in places. Covers 24.2 per cent of area.

**Wilson soils**—Black or very dark gray, heavy topsoil, waxy and sticky when wet but coarse and granular when dry, which grades into a dark bluish-gray or dull gray subsoil which passes into gray, calcareous, clay deep subsoil containing soft and hard white concretions of calcium carbonate. Covers 2.5 per cent of area.

**Stream-bottom Soils:**

**Bibb soils**—Light ash-gray topsoil underlain by dark-gray, silty clay loam several feet thick. Covers 3.8 per cent of area.

**Table 16. Analyses of soils of Polk County**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33197 | Bibb clay, surface | .105 | .049 | 31 | .88 | .34 | 297 | .50 | 1.11 | .34 | 5.4 | 0–1 |
| 33198 | Bibb clay, surface | .038 | .029 | 8 | .91 | .22 | 205 | .45 | .95 | .34 | 4.9 | 1–7 |
| 33199 | Bibb clay, subsoil | .035 | .028 | 10 | .82 | .22 | 192 | .51 | 1.02 | .47 | 5.4 | 7–24 |
| 33195 | Bibb clay loam, surface | .161 | .070 | 169 | .92 | .19 | 159 | .69 | 1.37 | .30 | 6.9 | 0–7 |
| 33196 | Bibb clay loam, subsoil | .107 | .050 | 44 | .92 | .13 | 93 | .63 | 1.14 | .30 | 6.2 | 7–24 |
| 33193 | Bibb fine sandy loam, surface | .036 | .036 | 231 | 1.32 | .06 | 150 | .13 | .14 | .11 | 4.6 | 0–7 |
| 33194 | Bibb fine sandy loam, subsoil | .029 | .014 | 49 | 1.40 | .05 | 84 | .09 | .13 | .11 | 4.7 | 7–24 |
| 47156 | Bibb fine sandy loam, surface | ........ | .037 | 34 | ........ | ........ | 58 | ........ | .39 | ........ | 5.2 | 0–6 |
| Average | Bibb fine sandy loam, surface | .036 | .037 | 133 | 1.32 | .06 | 104 | .13 | .27 | .11 | 4.9 | ........ |
| 33149 | Caddo fine sand, surface | .078 | .030 | 23 | .27 | .05 | 90 | .12 | .30 | .07 | 7.1 | 0–2 |
| 33150 | Caddo fine sand, surface | .023 | .014 | 7 | .18 | .03 | 66 | .04 | .16 | .07 | 6.9 | 2–7 |
| 33151 | Caddo fine sand, subsoil | .014 | .010 | 5 | .17 | .04 | 67 | .03 | .19 | .06 | 5.8 | 7–24 |
| 33126 | Crockett clay loam, surface | .071 | .023 | 8 | .54 | .21 | 91 | .53 | .74 | .30 | 6.0 | 0–7 |
| 33127 | Crockett clay loam, subsoil | .039 | .016 | 6 | .48 | .28 | 99 | .76 | 1.12 | .54 | 5.7 | 7–24 |
| 33185 | Crockett clay loam, surface | .073 | .016 | 8 | .43 | .16 | 94 | .43 | .60 | .27 | 5.8 | 0–7 |
| 33186 | Crockett clay loam, subsoil | .043 | .018 | 5 | .44 | .30 | 117 | .75 | 1.04 | .51 | 5.7 | 7–24 |
| 47153 | Crockett clay loam, surface | .080 | .029 | 16 | ........ | ........ | 141 | ........ | 1.22 | ........ | 6.1 | 0–4 |
| 47155 | Crockett clay loam, surface | .119 | .036 | 20 | ........ | ........ | 68 | ........ | .85 | ........ | 5.7 | 0–4 |
| Average | Crockett clay loam, surface | .086 | .026 | 13 | .49 | .19 | 99 | .48 | .85 | .29 | 5.9 | ........ |
| Average | Crockett clay loam, subsoil | .041 | .017 | 6 | .46 | .29 | 108 | .76 | 1.08 | .53 | 5.7 | ........ |
| 33128 | Garner clay, surface | .095 | .050 | 6 | .53 | .13 | 143 | .51 | .98 | .33 | 5.5 | 0–7 |
| 33141 | Garner clay, surface | .044 | .028 | 5 | .48 | .24 | 169 | .55 | .98 | .52 | 4.8 | 0–7 |
| 33140 | Garner clay, subsoil | .039 | .036 | 5 | .63 | .17 | 157 | .58 | 1.00 | .41 | 5.3 | 14–24 |
| 33200 | Garner clay, surface | .118 | .055 | 10 | .51 | .27 | 223 | .54 | 1.15 | .43 | 4.9 | 0–4 |
| 33201 | Garner clay, surface | .061 | .028 | 6 | .54 | .17 | 156 | .49 | 1.00 | .47 | 5.1 | 4–7 |
| 33202 | Garner clay, subsoil | .040 | .030 | 5 | .54 | .20 | 139 | .56 | 1.07 | .56 | 4.9 | 7–24 |
| 33209 | Garner clay, surface | .052 | .045 | 4 | .63 | .28 | 195 | .50 | .82 | .49 | 4.8 | 0–7 |
| Average | Garner clay, surface | .070 | .041 | 6 | .54 | .24 | 174 | .52 | .97 | .45 | 5.0 | ........ |
| Average | Garner clay, subsoil | .040 | .033 | 5 | .59 | .19 | 148 | .55 | 1.04 | .49 | 5.1 | ........ |
| 33124 | Lufkin fine sandy loam, surface | .047 | .022 | 15 | 1.20 | .06 | 108 | .11 | .21 | .09 | 5.3 | 0–3 |
| 33125 | Lufkin fine sandy loam, surface | .036 | .019 | 8 | 1.04 | .04 | 60 | .11 | .12 | .08 | 5.0 | 3–7 |
| 33133 | Lufkin fine sandy loam, subsoil | .036 | .011 | 11 | 1.08 | .04 | 53 | .08 | .13 | .08 | 5.1 | 7–10 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33208 | Lufkin fine sandy loam, subsoil | .029 | .010 | 10 | 1.16 | .07 | 60 | .08 | .02 | .13 | 4.9 | 10–24 |
| 33168 | Lufkin fine sandy loam, surface | .029 | .002 | 25 | 1.37 | .19 | 80 | .12 | .29 | .11 | 5.6 | 0–7 |
| 33169 | Lufkin fine sandy loam, subsoil | .045 | .011 | 13 | 1.42 | .10 | 84 | .17 | .26 | .18 | 5.7 | 7–24 |
| 33170 | Lufkin fine sandy loam, surface | .052 | .020 | 14 | 1.11 | .09 | 134 | .15 | .30 | .13 | 5.7 | 0–3 |
| 33171 | Lufkin fine sandy loam, surface | .048 | .015 | 13 | .94 | .06 | 110 | .10 | .17 | .12 | 5.0 | 3–7 |
| 33172 | Lufkin fine sandy loam, subsoil | .044 | .016 | 12 | .96 | .06 | 66 | .11 | .15 | .11 | 5.0 | 7–10 |
| 33173 | Lufkin fine sandy loam, subsoil | .032 | .006 | 8 | .98 | .05 | 60 | .09 | .14 | .10 | 5.3 | 10–24 |
| 47154 | Lufkin fine sandy loam, surface | .090 | .035 | 15 | ........ | ........ | 180 | ........ | .40 | ........ | 6.8 | 0–4 |
| Average | Lufkin fine sandy loam, surface | .053 | .019 | 17 | 1.17 | .11 | 117 | .12 | .28 | .11 | 5.7 | ........ |
| Average | Lufkin fine sandy loam, subsoil | .037 | .011 | 11 | 1.12 | .06 | 68 | .11 | .14 | .12 | 5.2 | ........ |
| 33163 | Lufkin very fine sandy loam, surface | .124 | .052 | 33 | .99 | .09 | 206 | .22 | .44 | .15 | 6.3 | 0–3 |
| 33164 | Lufkin very fine sandy loam, surface | .064 | .029 | 12 | 1.07 | .05 | 121 | .10 | .14 | .11 | 4.6 | 3–7 |
| 33165 | Lufkin very fine sandy loam, subsoil | .045 | .017 | 10 | 1.02 | .09 | 95 | .08 | .12 | .17 | 4.6 | 7–12 |
| 33167 | Lufkin very fine sandy loam, subsoil | .080 | .026 | 7 | .88 | .31 | 184 | .24 | .55 | .53 | 4.6 | 12–24 |
| 33191 | Ochlockonee clay loam, surface | .156 | .071 | 73 | .95 | .35 | 276 | .54 | 1.00 | .40 | 6.1 | 0–7 |
| 33192 | Ochlockonee clay loam, subsoil | .095 | .053 | 14 | .94 | .30 | 156 | .50 | .87 | .39 | 5.3 | 7–24 |
| 47152 | Ochlockonee clay loam, surface | .135 | .072 | 79 | ........ | ........ | 274 | ........ | .69 | ........ | 6.1 | 0–4 |
| 3173 | Ochlockonee clay loam, probably, surface | .222 | .072 | ........ | ........ | .49 | ........ | .66 | ........ | .18 | ........ | 0–6 |
| 3174 | Ochlockonee clay loam, probably, subsoil | .084 | .047 | ........ | ........ | .55 | ........ | .68 | ........ | .55 | ........ | 6–18 |
| Average | Ochlockonee clay loam, surface | .171 | .072 | 76 | .95 | .42 | 275 | .60 | .85 | .29 | 6.1 | ........ |
| Average | Ochlockonee clay loam, subsoil | .090 | .050 | 14 | .94 | .43 | 156 | .59 | .87 | .47 | 5.3 | ........ |
| 33187 | Ochlockonee fine sandy loam, surface | .278 | .091 | 147 | .96 | .29 | 346 | .67 | 1.24 | .29 | 7.5 | 0–4 |
| 33188 | Ochlockonee fine sandy loam, surface | .123 | .069 | 40 | 1.10 | .30 | 202 | .49 | .85 | .23 | 7.8 | 4–7 |
| 33189 | Ochlockonee fine sandy loam, subsoil | .076 | .051 | 21 | 1.14 | .27 | 150 | .41 | .58 | .24 | 7.5 | 7–10 |

**Table 16. Analyses of soils of Polk County (continued)**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33190 | Ochlockonee fine sandy loam, subsoil | .049 | .039 | 12 | 1.14 | .33 | 152 | .41 | .64 | .32 | 7.1 | 10–24 |
| 33159 | Ruston fine sandy loam, surface | .104 | .032 | 19 | .19 | .04 | 96 | .22 | .53 | .09 | 7.6 | 0–3 |
| 33160 | Ruston fine sandy loam, surface | .045 | .019 | 9 | .19 | .02 | 71 | .07 | .09 | .05 | 7.7 | 3–7 |
| 33161 | Ruston fine sandy loam, subsoil | .024 | .005 | 6 | .20 | .03 | 64 | .06 | .03 | .05 | 7.6 | 7–12 |
| 33162 | Ruston fine sandy loam, subsoil | .027 | .019 | 5 | .24 | .08 | 64 | .09 | .21 | .05 | 5.9 | 12–24 |
| 33156 | Segno fine sand, surface | .050 | .024 | 29 | .19 | .03 | 62 | .12 | .32 | .08 | 7.1 | 0–4 |
| 33157 | Segno fine sand, surface | .018 | .015 | 8 | .18 | .04 | 47 | .10 | .17 | .04 | 7.2 | 4–7 |
| 33158 | Segno fine sand, subsoil | .013 | .015 | 7 | .20 | .04 | 55 | .05 | .19 | .04 | 7.6 | 7–24 |
| 13201 | Segno fine sand, probably surface | .045 | .015 | 33 | ........ | .05 | 49 | .04 | .40 | .05 | ........ | 0–6 |
| 13202 | Segno fine sand, probably, subsoil | .025 | .013 | 13 | ........ | .04 | 41 | .08 | .10 | .09 | ........ | 6–12 |
| Average | Segno fine sand, surface | .040 | .018 | 26 | .19 | .05 | 52 | .08 | .33 | .06 | 7.2 | ........ |
| Average | Segno fine sand, subsoil | .019 | .014 | 10 | .20 | .04 | 48 | .07 | .15 | .07 | 7.6 | ........ |
| 33129 | Segno fine sandy loam, surface | .079 | .025 | 50 | .13 | .03 | 116 | .31 | .61 | .06 | 6.8 | 0–3 |
| 33130 | Segno fine sandy loam, surface | .030 | .017 | 7 | .19 | .03 | 58 | .08 | .06 | .04 | 6.6 | 3–7 |
| 33131 | Segno fine sandy loam, subsoil | .021 | .014 | 6 | .12 | .02 | 33 | .09 | .00 | .04 | 6.4 | 7–15 |
| 33132 | Segno fine sandy loam, deep subsoil | .045 | .023 | 4 | .20 | .14 | 95 | .12 | .24 | .13 | 5.5 | 18–24 |
| 33142 | Segno fine sandy loam, surface | .028 | .018 | 17 | .14 | .07 | 84 | .06 | .20 | .04 | 5.9 | 0–7 |
| 33143 | Segno fine sandy loam, subsoil | .021 | .009 | 6 | .12 | .04 | 84 | .04 | .15 | .04 | 5.1 | 7–13 |
| 33144 | Segno fine sandy loam, deep subsoil | .023 | .024 | 4 | .23 | .11 | 93 | .08 | .27 | .06 | 4.5 | 13–24 |
| 33145 | Segno fine sandy loam, surface | .056 | .014 | 27 | .22 | .05 | 111 | .16 | .35 | .05 | 5.6 | 0–3 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33146 | Segno fine sandy loam, surface | .030 | .016 | 11 | .16 | .06 | 67 | .06 | .25 | .04 | 5.9 | 3–7 |
| 33147 | Segno fine sandy loam, subsoil | .020 | .020 | 5 | .17 | .07 | 85 | .07 | .27 | .05 | 6.0 | 7–18 |
| 33148 | Segno fine sandy loam, deep subsoil | .040 | .028 | 3 | .25 | .14 | 95 | .13 | .36 | .13 | 5.0 | 18–24 |
| 33152 | Segno fine sandy loam, surface | .025 | .017 | 23 | .17 | .06 | 108 | .07 | .15 | .06 | 6.9 | 0–7 |
| 33153 | Segno fine sandy loam, subsoil | .019 | .021 | 6 | .17 | .05 | 105 | .07 | .17 | .07 | 6.6 | 7–18 |
| 33154 | Segno fine sandy loam, deep subsoil | .032 | .025 | 5 | .34 | .13 | 261 | .10 | .29 | .10 | 5.3 | 18–24 |
| 33155 | Segno fine sandy loam, surface | .056 | .034 | 88 | .15 | .06 | 146 | .09 | .28 | .06 | 6.6 | 0–3 |
| 47157 | Segno fine sandy loam, surface | .033 | .011 | 12 | ........ | ........ | 48 | ........ | .28 | ........ | 5.4 | 0–6 |
| Average | Segno fine sandy loam, surface | .040 | .019 | 31 | .16 | .06 | 94 | .11 | .26 | .05 | 6.2 | ........ |
| Average | Segno fine sandy loam, subsoil | .020 | .016 | 6 | .15 | .05 | 77 | .07 | .15 | .05 | 6.0 | ........ |
| Average | Segno fine sandy loam, deep subsoil | .035 | .025 | 4 | .26 | .13 | 136 | .11 | .29 | .11 | 5.1 | ........ |
| 33134 | Susquehanna fine sandy loam, surface | .091 | .036 | 11 | .23 | .06 | 61 | .24 | .42 | .12 | 5.9 | 0–7 |
| 33135 | Susquehanna fine sandy loam, subsoil | .026 | .009 | 5 | .19 | .02 | 40 | .08 | .07 | .07 | 5.4 | 7–18 |
| 33136 | Susquehanna fine sandy loam, deep subsoil | .043 | .026 | 5 | .33 | .24 | 96 | .42 | .34 | .29 | 4.8 | 18–24 |
| 33174 | Susquehanna fine sandy loam, surface | .032 | .019 | 36 | .27 | .07 | 73 | .05 | .05 | .06 | 5.4 | 0–7 |
| 33175 | Susquehanna fine sandy loam, subsoil | .039 | .019 | 7 | .36 | .19 | 181 | .11 | .15 | .26 | 4.7 | 7–12 |
| 33176 | Susquehanna fine sandy loam, deep subsoil | .029 | .015 | 5 | .38 | .24 | 122 | .06 | .10 | .34 | 4.4 | 12–24 |
| 33177 | Susquehanna fine sandy loam, surface | .059 | .035 | 23 | .19 | ........ | 118 | ........ | .46 | ........ | 5.2 | 0–7 |
| 33178 | Susquehanna fine sandy loam, subsoil | .033 | .019 | 6 | .21 | .19 | 91 | .35 | .64 | .32 | 5.4 | 7–24 |
| 33179 | Susquehanna fine sandy loam, surface | .089 | .035 | 12 | .14 | .20 | 63 | .26 | .42 | .17 | 5.8 | 0–7 |
| 33180 | Susquehanna fine sandy loam, subsoil | .026 | .013 | 6 | .13 | .08 | 36 | .08 | .12 | .07 | 5.8 | 7–18 |
| 33181 | Susquehanna fine sandy loam, deep subsoil | .043 | .021 | 5 | .26 | .21 | 101 | .24 | .41 | .29 | 5.0 | 18–24 |
| 7163 | Susquehanna fine sandy loam, probably, surface | .037 | .038 | 42 | ........ | .08 | 151 | .31 | 1.76 | .07 | ........ | 0–12 |
| 7164 | Susquehanna fine sandy loam, probably, subsoil | .038 | .039 | 25 | ........ | .07 | 104 | .28 | .20 | .09 | ........ | 12–24 |

**Table 16. Analyses of soils of Polk County (continued)**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9333 | Susquehanna fine sandy loam, probably, surface......... | .028 | .040 | 22 | ........ | .08 | 141 | .28 | .27 | .09 | ........ | 0–12 |
| 9334 | Susquehanna fine sandy loam, probably, subsoil......... | .047 | .028 | 8 | .47 | .22 | 125 | .04 | .73 | .21 | ........ | 12–24 |
| Average | Susquehanna fine sandy loam, surface.................. | .056 | .034 | 24 | .21 | .10 | 101 | .23 | .56 | .10 | 5.6 | ........ |
| Average | Susquehanna fine sandy loam, subsoil.................. | .035 | .021 | 10 | .27 | .13 | 96 | .16 | .32 | .17 | 5.3 | ........ |
| Average | Susquehanna fine sandy loam, deep subsoil............. | .038 | .021 | 5 | .32 | .23 | 106 | .24 | .28 | .31 | 4.8 | ........ |
| 7341 | Wilson clay, probably, surface | .105 | .038 | 22 | ........ | .21 | 161 | 1.49 | 2.52 | .29 | 6.4 | 0–7 |
| 7342 | Wilson clay, probably, subsoil | .055 | .030 | 21 | ........ | .23 | 90 | 3.14 | 5.93 | .11 | ........ | 7–14 |
| 9981 | Wilson clay, probably, surface | .108 | .038 | 7 | ........ | .29 | 263 | 1.44 | 2.52 | .88 | ........ | 0–6 |
| 9982 | Wilson clay, probably, subsoil | .043 | .033 | 11 | ........ | .32 | 131 | 1.68 | 2.82 | 1.04 | ........ | 6–12 |
| 33137 | Wilson clay, surface........ | .222 | .039 | 22 | .70 | .31 | 306 | 1.32 | 2.37 | .66 | 6.3 | 0–7 |
| 33138 | Wilson clay, subsoil......... | .124 | .028 | 9 | .62 | .37 | 220 | 1.34 | 2.15 | .72 | 5.7 | 7–14 |
| 33139 | Wilson clay, deep subsoil.... | .069 | .018 | 8 | .62 | .33 | 221 | 1.44 | 2.03 | .89 | 6.1 | 14–24 |
| 33182 | Wilson clay, surface........ | .218 | .037 | 18 | .58 | .43 | 283 | 1.34 | 2.34 | .76 | 6.2 | 0–7 |
| 33183 | Wilson clay, subsoil......... | .141 | .024 | 9 | .54 | .36 | 182 | 1.23 | 2.05 | .75 | 5.5 | 7–14 |
| 33184 | Wilson clay, deep subsoil.... | .059 | .016 | 7 | .52 | .37 | 165 | 1.39 | 1.99 | .98 | 5.6 | 14–24 |
| Average | Wilson clay, surface........ | .163 | .038 | 17 | .64 | .31 | 253 | 1.40 | 2.44 | .65 | 6.3 | ........ |
| Average | Wilson clay, subsoil......... | .091 | .029 | 13 | .58 | .32 | 156 | 1.85 | 3.24 | .66 | 5.6 | ........ |
| Average | Wilson clay, deep subsoil.... | .064 | .017 | 8 | .57 | .35 | 193 | 1.42 | 2.01 | .93 | 5.9 | ........ |

### Table 17. Grades of constituents of surface soils of Polk County

| Laboratory Number | Soil type | Nitrogen | Total Phos. Acid | Active Phos. Acid | Total Potash | Acid-Soluble Potash | Active Potash | Acid-Soluble Lime | Basicity | Acid-Soluble Magnesia | pH |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | Bibb clay | 3 | 4 | 5 | 3 | 3 | 2 | 2 | 3 | 2 | 4 |
| 33195 | Bibb clay loam | 2 | 3 | 3 | 3 | 4 | 3 | 2 | 3 | 3 | 2 |
| Average | Bibb fine sandy loam | 4 | 4 | 3 | 2 | 5 | 3 | 4 | 5 | 4 | 5 |
| Average | Caddo fine sand | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 2 |
| Average | Crockett clay loam | 3 | 4 | 5 | 4 | 4 | 4 | 2 | 3 | 3 | 3 |
| Average | Garner clay | 3 | 4 | 5 | 4 | 3 | 3 | 2 | 3 | 2 | 4 |
| Average | Lufkin fine sandy loam | 4 | 5 | 5 | 3 | 4 | 3 | 4 | 5 | 4 | 3 |
| 33163 | Lufkin very fine sandy loam | 3 | 4 | 5 | 3 | 5 | 3 | 4 | 5 | 4 | 4 |
| Average | Ochlockonee clay loam | 2 | 3 | 4 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |
| Average | Ochlockonee fine sandy loam | 1 | 3 | 4 | 3 | 3 | 2 | 2 | 3 | 3 | 1 |
| Average | Ruston fine sandy loam | 3 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 1 |
| Average | Segno fine sand | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 5 | 2 |
| Average | Segno fine sandy loam | 4 | 5 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 2 |
| Average | Susquehanna fine sandy loam | 4 | 4 | 5 | 5 | 5 | 3 | 3 | 4 | 4 | 3 |
| Average | Wilson clay | 2 | 4 | 5 | 3 | 3 | 2 | 2 | 2 | 1 | 2 |

### Table 18. Pot experiments on soils of Polk County

| Laboratory Number | Soil type and crop | Weight of crop in grams | | | | Corn possibility of plant food withdrawn, in bushels | | |
|---|---|---|---|---|---|---|---|---|
| | | With complete fertilizer | Without phosphoric acid | Without nitrogen | Without potash | Phosphoric acid | Nitrogen | Potash |
| 33126 | Crockett clay loam, surface, corn | 33.9 | 3.6 | 12.7 | 34.0 | 5 | 20 | 156 |
| 33126 | Crockett clay loam, surface, sorghum | 28.4 | 9.3 | 9.6 | 25.9 | 13 | 17 | 77 |
| 33128 | Garner clay, surface, corn | 28.5 | 3.1 | 19.8 | 21.9 | 6 | 41 | 223 |
| 33128 | Garner clay, surface, sorghum | 29.5 | 10.9 | 10.9 | 33.8 | 13 | 17 | 116 |
| 33140 | Garner clay, subsoil, corn | | 2.7 | | | 4 | | |
| 33141 | Garner clay, surface, corn | 13.2 | 3.4 | 7.8 | 17.4 | 4 | 19 | 252 |
| 33141 | Garner clay, surface, sorghum | 21.2 | 2.4 | 4.8 | 19.4 | 4 | 12 | 93 |
| 33209 | Garner clay, surface, sorghum | | 3.0 | | 19.2 | 3 | | 85 |
| 33209 | Garner clay, surface, corn | | 2.8 | | 17.2 | 3 | | 205 |
| 33124 | Lufkin fine sandy loam, surface, corn | | | 6.9 | | | 9 | |
| 33125 | Lufkin fine sandy loam, subsoil, corn | | 3.3 | | | 4 | | |
| 33133 | Lufkin fine sandy loam, subsoil, corn | | 1.1 | 6.5 | | 1 | 10 | |
| 33208 | Lufkin fine sandy loam, subsoil, sorghum | | 0.5 | | 18.8 | 1 | | 29 |
| 33208 | Lufkin fine sandy loam, subsoil, corn | | 2.7 | | 27.5 | 3 | | 84 |
| 33129 | Segno fine sandy loam, surface, corn | 22.2 | 8.7 | 16.6 | 22.6 | 20 | 31 | 166 |

**Table 18. Pot experiments on soils of Polk County (continued)**

| Laboratory Number | Soil type and crop | Weight of crop in grams | | | | Corn possibility of plant food withdrawn, in bushels | | |
|---|---|---|---|---|---|---|---|---|
| | | With complete fertilizer | Without phosphoric acid | Without nitrogen | Without potash | Phosphoric acid | Nitrogen | Potash |
| 33129 | Segno fine sandy loam, surface, sorghum | 20.1 | 12.3 | 18.9 | 19.5 | 21 | 30 | 61 |
| 33130 | Segno fine sandy loam, subsoil, corn | | | | 27.1 | | | 104 |
| 33131 | Segno fine sandy loam, subsoil, corn | | | 7.8 | | | 10 | |
| 33132 | Segno fine sandy loam, subsoil, corn | | | 13.4 | | | 18 | |
| 7163 | Susquehanna fine sandy loam, surface, corn | 49.4 | | 19.4 | | | 22 | |
| 7163 | Susquehanna fine sandy loam, surface, corn | 36.7 | | 5.5 | | | 8 | |
| 7163 | Susquehanna fine sandy loam, surface, sorghum | 37.7 | | 3.7 | | | 10 | |
| 7163 | Susquehanna fine sandy loam, surface, sorghum | 24.0 | | 3.5 | | | 6 | |
| 7164 | Susquehanna fine sandy loam, subsoil, corn | 40.4 | | 7.4 | | | 10 | |
| 7164 | Susquehanna fine sandy loam, subsoil, corn | 25.7 | | 1.3 | | | 2 | |
| 7164 | Susquehanna fine sandy loam, subsoil, sorghum | 23.4 | | 1.0 | | | 2 | |
| 7164 | Susquehanna fine sandy loam, subsoil, sorghum | 27.5 | | 1.2 | | | 2 | |
| 9333 | Susquehanna fine sandy loam, surface, corn | 41.7 | 20.1 | | | 32 | | |
| 9333 | Susquehanna fine sandy loam, surface, corn | 37.9 | 7.7 | | | 10 | | |
| 9333 | Susquehanna fine sandy loam, surface, sorghum | 21.5 | 10.0 | | | 13 | | |
| 9333 | Susquehanna fine sandy loam, surface, sorghum | 33.2 | 9.4 | | | 7 | | |
| 9334 | Susquehanna fine sandy loam, subsoil, corn | 37.7 | | | 35.1 | | | 232 |
| 9334 | Susquehanna fine sandy loam, subsoil, corn | 18.8 | | | 25.2 | | | 103 |
| 9334 | Susquehanna fine sandy loam, subsoil, sorghum | 23.7 | | | 22.0 | | | 63 |
| 9334 | Susquehanna fine sandy loam, subsoil, sorghum | 16.5 | | | 17.4 | | | 27 |
| 33135 | Susquehanna fine sandy loam, subsoil, corn | | | 14.5 | | | 16 | |
| 7341 | Wilson clay, probably, surface, corn | 27.4 | 18.4 | | | 45 | | |
| 7341 | Wilson clay, probably, surface, corn | 23.0 | 11.4 | | | 13 | | |
| 7341 | Wilson clay, probably, surface, sorghum | 18.0 | 21.0 | | | 27 | | |
| 7341 | Wilson clay, probably, surface, sorghum | 10.5 | 20.4 | | | 18 | | |
| 7342 | Wilson clay, probably, subsoil, corn | 14.7 | | 13.8 | | | 31 | |
| 7342 | Wilson clay, probably, subsoil, corn | 10.7 | | 3.0 | | | 6 | |
| 7342 | Wilson clay, probably, subsoil, sorghum | 16.5 | | 3.5 | | | 8 | |
| 7342 | Wilson clay, probably, subsoil, sorghum | 22.3 | | 2.8 | | | 6 | |
| 33137 | Wilson clay, surface, corn | | 3.5 | 32.0 | | 6 | 90 | |
| 33137 | Wilson clay, surface, sorghum | | 26.7 | 32.0 | | 36 | 62 | |
| 33138 | Wilson clay, subsoil, corn | | 3.9 | | | 4 | | |
| 33139 | Wilson clay, subsoil, corn | 31.4 | 3.1 | 15.0 | 28.5 | 4 | 26 | 275 |
| 33139 | Wilson clay, subsoil, sorghum | 22.0 | 1.1 | 8.0 | 24.0 | | 13 | 108 |

**Composition of Soils**—Table 16 gives the analyses of the different soil types and Table 17 the grades of constituents of the surface soils. Most of the upland soils are deficient (Grades 5 and 4) in most constituents. The alluvial soils are somewhat higher than the upland soils in all of the constituents. Upland soils of the Wilson-Crockett group of the Blackland Prairies are somewhat higher in nitrogen, acid-soluble lime, and acid-soluble magnesia than the upland soils of the East Texas Timber Country.

**Pot experiments**—Results of pot experiments are given in Table 18. The soils all responded to additions of nitrogen and phosphoric acid; the response to phosphoric acid was considerably greater than that to nitrogen. The soils did not respond to the addition of potash. The corn possibility of the plant food withdrawn was extremely low for phosphoric acid, nitrogen, and for potash.

**Fertilizers**—The need of most of the soils for fertilizers carrying nitrogen and phosphoric acid is strongly indicated. Some of the lighter soils may respond to additions of potash. Lime is probably not needed at present on most of the soils, but may be needed for legume crops or after the soils have been in cultivation for a longer period of time. This is particularly true with respect to soils of light texture.

## Soils of Scurry County

Scurry County comprises an area of 910 square miles in west-central Texas, and lies in the southwestern part of the Rolling Plains region of Texas. Thirty types and phases of soils in 10 series were mapped. The most extensive soil type is the Abilene clay loam which covers 17.3 per cent of the area, followed by Miles fine sandy loam, on 12.4 per cent of the area. Rough, broken, and stony land covers 13.4 per cent of the area. Upland soils include the red soils of the Miles, Vernon, and Weymouth series (33.0 per cent of the area) and the dark-brown or black soils of the Abilene, Potter, Roscoe, and Valera series (48.9 per cent of the area). Alluvial soils of the Spur and Miller series cover 3.9 per cent of the area. Good crop soils cover 50.9 per cent of the area, fair to poor crop soils 23.4 per cent, and soils unsuitable for farming 25.7 per cent.

## Description of Soils

### Upland Soils:

**Abilene soils**—Dark-brown, noncalcareous, friable topsoil grading into dark-brown, calcareous, friable or slightly compact subsoil which in turn grades into brown or slightly reddish brown, highly calcareous deep subsoil which rests on nearly white loamy chalklike material. Covers 30.1 per cent of area.

**Miles soils**—Dark reddish-brown, friable, noncalcareous topsoil which grades into dark reddish-brown, rather friable, noncalcareous subsoil on a reddish-brown, sandy clay loam subsoil which changes to dull reddish-yellow calcareous loam a few inches above the top of a chalklike layer. Covers 21.3 per cent of area.

**Randall soils**—Dark-gray or bluish-gray, extremely heavy, plastic topsoil which becomes slightly lighter colored with increase in depth and below a depth of about 5 feet merges with grayish-yellow, compact clay. Covers .8 per cent of area.

**Roscoe soils**—Very dark brown or nearly black, noncalcareous, friable topsoil resting on dark-brown, rather friable and coarsely granular subsoil underlain by brown, compact, calcareous, clay deep subsoil on a chalky layer. Covers 1.5 per cent of area.

**Valera soils**—Dark reddish-brown or chocolate-brown, friable, heavy topsoil resting on brown or reddish-brown, calcareous, compact clay subsoil abruptly underlain by white caliche or accumulated calcium carbonate which is hard and stonelike. Covers .8 per cent of area.

**Vernon soils**—Dull reddish-brown, calcareous, heavy topsoil containing a few hard lumps of calcium carbonate and grading downward into pale brownish-red, friable clay loam spotted with white, hard and soft lumps of calcium carbonate. Covers 11.0 per cent of area.

**Stream-bottom Soils:**

**Spur soils**—Dark-brown, friable, granular, calcareous topsoil which becomes less dark with depth and grades below into light-brown, friable, cloddy subsoil at a depth of about 30 inches. Covers 2.9 per cent of area.

**Composition of Soils**—Table 19 gives the analyses of the different soil types and Table 20 the grades of constituents of the surface soils. The soils are moderately to well supplied with nitrogen (Grades 2 and 3), moderate to deficient in total phosphoric acid and active phosphoric acid (mostly Grades 4 and 5), well supplied to high in potash (Grades 1 and 2), acid-soluble lime, acid-soluble magnesia, and basicity. The soils are neutral to alkaline in pH.

**Pot experiments**—Table 21 gives the results of pot experiments. The soils responded to additions of nitrogen and phosphoric acid, but did not respond to potash. The corn possibility of the plant food withdrawn was very low for both phosphoric acid and nitrogen.

**Fertilizers**—The need of most of the soils for fertilizers carrying nitrogen and phosphoric acid is strongly indicated. Some of the lighter soils may respond to potash for certain crops. Moisture in this county is the limiting factor for crop production, and fertilizers should not be used in excess of the quantity required to produce the crops which may be produced with the available moisture. Lime is not needed on these soils.

**Table 19. Analyses of soils of Scurry County**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20661 | Abilene clay loam, surface... | .123 | .057 | 77 | 1.81 | .53 | 685 | .72 | 1.10 | .62 | 6.6 | 0–4 |
| 20662 | Abilene clay loam, subsoil... | .102 | .045 | 62 | 2.12 | .55 | 639 | .72 | 1.15 | .65 | 6.8 | 4–12 |
| 20663 | Abilene clay loam, subsoil... | .071 | .046 | 33 | 1.98 | .33 | 355 | 4.40 | 7.10 | .57 | 7.3 | 12–24 |
| 20664 | Abilene clay loam, deep subsoil.................. | .043 | .049 | 10 | 1.28 | .58 | 128 | 19.69 | ........ | .54 | 7.8 | 24–36 |
| 35040 | Abilene clay loam, surface... | .170 | .067 | 158 | 1.78 | .68 | 732 | 1.12 | 2.35 | .56 | 8.1 | 0–1 |
| 35041 | Abilene clay loam, surface... | .137 | .062 | 94 | 1.84 | .80 | 436 | .84 | 1.68 | .71 | 7.8 | 1–7 |
| 35042 | Abilene clay loam, subsoil... | .107 | .057 | 66 | 1.94 | .83 | 501 | 1.49 | 2.99 | .63 | 8.0 | 7–19 |
| 35043 | Abilene clay loam, deep subsoil.................. | .055 | .044 | 26 | 1.92 | .96 | 276 | 5.95 | 9.40 | .63 | 8.1 | 19–30 |
| 35044 | Abilene clay loam, deep subsoil.................. | .043 | .046 | 7 | 1.77 | .71 | 185 | 8.87 | 15.87 | .72 | 8.3 | 30–42 |
| 35045 | Abilene clay loam, deep subsoil.................. | .036 | .069 | 4 | 1.16 | .42 | 84 | 31.29 | 5.56 | .86 | 8.3 | 42–66 |
| 35046 | Abilene clay loam, deep subsoil.................. | .013 | .044 | 10 | 1.61 | .81 | 127 | 18.24 | 33.32 | .94 | 8.2 | 66–144 |
| 35085 | Abilene clay loam, surface... | .151 | .046 | 98 | 1.68 | ........ | 634 | ........ | 2.72 | ........ | 7.9 | 0–7 |
| 35086 | Abilene clay loam, subsoil... | .110 | .049 | 59 | ........ | ........ | 504 | ........ | 1.45 | ........ | 7.2 | 7–19 |
| 35098 | Abilene clay loam, surface... | .106 | .054 | 42 | ........ | ........ | 641 | ........ | 1.49 | ........ | 8.0 | 0–7 |
| 35099 | Abilene clay loam, subsoil... | .095 | .045 | 37 | ........ | ........ | 500 | ........ | 1.85 | ........ | 8.0 | 7–19 |
| 35100 | Abilene clay loam, surface... | .107 | .051 | 55 | ........ | ........ | 549 | ........ | 1.33 | ........ | 8.0 | 0–7 |
| 35101 | Abilene clay loam, subsoil... | .090 | .051 | 32 | ........ | ........ | 436 | ........ | 3.65 | ........ | 8.1 | 7–19 |
| 35102 | Abilene clay loam, surface... | .102 | .059 | 120 | ........ | ........ | 656 | ........ | 1.34 | ........ | 8.1 | 0–7 |
| 35103 | Abilene clay loam, subsoil... | .090 | .055 | 49 | ........ | ........ | 515 | ........ | 1.15 | ........ | 7.7 | 7–19 |
| 35116 | Abilene clay loam, surface... | .136 | .062 | 82 | ........ | .74 | 625 | .99 | 1.63 | .54 | 8.1 | 0–7 |
| 35117 | Abilene clay loam, subsoil... | .120 | .060 | 68 | ........ | .74 | 495 | 1.39 | 2.53 | .82 | 8.0 | 7–19 |
| 20614 | Abilene clay loam, surface... | .181 | .083 | 275 | 1.44 | .58 | 789 | 2.37 | 3.98 | .73 | 7.1 | 0–4 |
| 20615 | Abilene clay loam, subsoil... | .136 | .081 | 200 | 1.35 | .67 | 629 | 4.21 | 6.85 | .74 | 7.3 | 4–12 |
| 20616 | Abilene clay loam, deep subsoil.................. | .090 | .057 | 241 | 1.24 | .73 | 633 | 2.46 | 4.00 | .78 | 7.4 | 12–24 |
| 20623 | Abilene clay loam, deep subsoil.................. | .069 | .051 | 54 | 1.61 | .57 | 355 | 5.55 | 10.80 | .53 | ........ | 24–36 |
| 35031 | Abilene clay loam, shallow phase, surface........... | .161 | .063 | 69 | 1.50 | .51 | 238 | 4.99 | 8.25 | .68 | 8.0 | 0–7 |
| 35032 | Abilene clay loam, shallow phase, subsoil........... | .116 | .050 | 7 | 1.61 | .53 | 124 | 6.88 | 16.70 | .56 | 8.0 | 7–19 |

**Table 19. Analyses of soils of Scurry County (continued)**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35033 | Abilene clay loam, shallow phase, deep subsoil | .044 | .046 | 4 | .94 | .27 | 21 | 30.74 | 55.00 | .67 | 8.2 | 19–36 |
| 35066 | Abilene clay loam, shallow phase, surface | .093 | .038 | 46 | 1.62 | ........ | 119 | ........ | 1.14 | ........ | 8.1 | 0–7 |
| 35067 | Abilene clay loam, shallow phase, subsoil | .070 | .033 | 36 | 1.34 | ........ | 260 | ........ | 5.02 | ........ | 8.2 | 7–19 |
| Average | Abilene clay loam, surface | .131 | .058 | 99 | 1.64 | .62 | 552 | 2.01 | 2.50 | .64 | 7.8 | ........ |
| Average | Abilene clay loam, subsoil | .102 | .053 | 60 | 1.66 | .64 | 446 | 3.31 | 4.63 | .67 | 7.7 | ........ |
| Average | Abilene clay loam, deep subsoil | .049 | .051 | 45 | 1.44 | .63 | 226 | 15.35 | 21.73 | .71 | 8.0 | ........ |
| 35053 | Abilene loam, surface | .088 | .033 | 35 | 1.36 | .35 | 305 | .45 | .60 | .33 | 7.9 | 0–7 |
| 35054 | Abilene loam, subsoil | .084 | .035 | 33 | 1.61 | .44 | 292 | 2.21 | 3.22 | .52 | 8.0 | 7–19 |
| 35096 | Abilene loam, surface | .102 | .034 | 82 | 1.49 | ........ | 502 | ........ | .96 | ........ | 8.0 | 0–7 |
| 35097 | Abilene loam, subsoil | .070 | .028 | 61 | 1.37 | ........ | 298 | ........ | 2.55 | ........ | 8.2 | 7–19 |
| Average | Abilene loam, surface | .095 | .034 | 59 | 1.43 | .35 | 404 | .45 | .78 | .33 | 8.0 | ........ |
| Average | Abilene loam, subsoil | .077 | .032 | 47 | 1.49 | .44 | 295 | 2.21 | 2.89 | .52 | 8.1 | ........ |
| 35055 | Miles clay loam, surface | .078 | .045 | 50 | 2.42 | .52 | 474 | .30 | .68 | .54 | 7.4 | 0–4 |
| 35056 | Miles clay loam, surface | .095 | .050 | 15 | 2.46 | .79 | 586 | .38 | .98 | .74 | 7.1 | 4–7 |
| 35057 | Miles clay loam, subsoil | .070 | .041 | 16 | 2.46 | .79 | 456 | .45 | 1.06 | .79 | 7.7 | 7–19 |
| 35058 | Miles clay loam, deep subsoil | .037 | .052 | 98 | 2.66 | .77 | 351 | 2.46 | 3.28 | 1.35 | 8.2 | 28–42 |
| 35059 | Miles clay loam, deep subsoil | .028 | .072 | 9 | 2.26 | .70 | 89 | 16.78 | 31.52 | 1.24 | 8.2 | 42–72 |
| 35060 | Miles clay loam, deep subsoil | .019 | .121 | 548 | 3.00 | .89 | 163 | 5.48 | 10.83 | 1.38 | 8.1 | 72–13 ft. |
| 35061 | Miles clay loam, deep subsoil | .015 | .146 | 542 | 3.34 | .60 | 41 | 8.06 | 19.95 | 2.36 | 8.6 | 13 ft.–15 ft. |
| 35087 | Miles clay loam, surface | .138 | .052 | 79 | 1.92 | ........ | 635 | ........ | .97 | ........ | 7.5 | 0–4 |
| 35088 | Miles clay loam, surface | .135 | .051 | 27 | 1.95 | ........ | 582 | ........ | 1.17 | ........ | 7.5 | 4–7 |
| 35089 | Miles clay loam, subsoil | .101 | .042 | 14 | 1.96 | ........ | 455 | ........ | 1.41 | ........ | 7.7 | 7–19 |
| 4916 | Miles clay loam, probably, surface | .076 | .063 | 28 | ........ | .83 | 426 | .52 | 1.07 | .34 | ........ | 0–8 |
| 4917 | Miles clay loam, probably, subsoil | .032 | .050 | 58 | ........ | .68 | 274 | 1.70 | 3.27 | .23 | ........ | 8–24 |
| 8229 | Miles clay loam, probably, surface | .109 | .059 | 91 | ........ | .68 | 526 | 1.71 | 3.15 | .42 | ........ | 0–6 |
| 8230 | Miles clay loam, probably, subsoil | .079 | .053 | 54 | ........ | .72 | 414 | 3.02 | 5.25 | .37 | ........ | 6–18 |
| Average | Miles clay loam, surface | .102 | .056 | 51 | 2.19 | .72 | 523 | .86 | 1.53 | .47 | 7.4 | ........ |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | Miles clay loam, subsoil | .071 | .047 | 36 | 2.21 | .73 | 400 | 1.72 | 2.75 | .46 | 7.7 | ........ |
| Average | Miles clay loam, deep subsoil | .025 | .098 | 299 | 2.82 | .74 | 161 | 8.20 | 16.40 | 1.58 | 8.3 | ........ |
| 35070 | Miles fine sand, surface | .026 | .017 | 27 | .65 | .07 | 92 | .11 | .05 | .08 | 7.2 | 0–7 |
| 35071 | Miles fine sand, subsoil | .023 | .012 | 6 | .64 | .07 | 55 | .07 | 0 | .06 | 7.3 | 7–19 |
| 35072 | Miles fine sand, surface | .029 | .017 | 34 | .64 | .11 | 90 | .12 | 0 | .09 | 6.9 | 0–7 |
| 35073 | Miles fine sand, subsoil | .014 | .011 | 6 | .49 | .07 | 56 | .08 | 0 | .07 | 7.2 | 7–19 |
| 35112 | Miles fine sand, shallow phase, surface | .025 | .010 | 12 | .57 | .04 | 91 | .09 | .30 | .08 | 7.5 | 0–7 |
| 35113 | Miles fine sand, shallow phase, subsoil | .017 | .012 | 6 | .64 | .05 | 66 | .07 | .09 | .08 | 7.3 | 7–24 |
| 35114 | Miles fine sand, shallow phase, deep subsoil | .029 | .024 | 4 | 1.21 | .41 | 141 | .28 | .49 | .35 | 6.6 | 24–36 |
| Average | Miles fine sand, surface | .027 | .015 | 24 | .62 | .07 | 91 | .11 | .12 | .08 | 7.2 | ........ |
| Average | Miles fine sand, subsoil | .018 | .012 | 6 | .59 | .06 | 59 | .07 | .03 | .07 | 7.3 | ........ |
| Average | Miles fine sand, deep subsoil | .029 | .024 | 4 | 1.21 | .41 | 141 | .28 | .49 | .35 | 6.6 | ........ |
| 35074 | Miles fine sandy loam, surface | .071 | .045 | 75 | 1.92 | ........ | 373 | ........ | .40 | ........ | 7.6 | 0–7 |
| 35075 | Miles fine sandy loam, subsoil | .065 | .039 | 23 | 2.04 | ........ | 314 | ........ | .39 | ........ | 7.5 | 7–12 |
| 35076 | Miles fine sandy loam, deep subsoil | .061 | .037 | 15 | 2.10 | ........ | 294 | ........ | .60 | ........ | 7.5 | 12–24 |
| 35077 | Miles fine sandy loam, deep subsoil | .039 | .026 | 24 | 2.44 | ........ | 207 | ........ | .64 | ........ | 7.8 | 24–54 |
| 35079 | Miles fine sandy loam, deep subsoil | .027 | .035 | 79 | 1.96 | ........ | 150 | ........ | 1.35 | ........ | 8.5 | 54–66 |
| 35080 | Miles fine sandy loam, deep subsoil | .022 | .076 | 25 | 1.64 | ........ | ........ | ........ | 26.88 | ........ | 8.4 | 66–80 + |
| 35092 | Miles fine sandy loam, surface | .046 | .044 | 45 | 1.66 | ........ | 290 | ........ | .34 | ........ | 7.6 | 0–7 |
| 35093 | Miles fine sandy loam, surface | .056 | .041 | 39 | 1.75 | ........ | 230 | ........ | .43 | ........ | 7.3 | 0–7 |
| 35094 | Miles fine sandy loam, subsoil | .068 | .035 | 14 | 1.82 | ........ | 250 | ........ | .75 | ........ | 7.2 | 7–19 |
| 35095 | Miles fine sandy loam, subsoil | .061 | .036 | 22 | 1.76 | ........ | 284 | ........ | .63 | ........ | 7.4 | 7–19 |
| 35110 | Miles fine sandy loam, surface | .074 | .042 | 108 | 1.78 | .34 | 357 | .23 | .60 | .30 | 7.8 | 0–7 |
| 35111 | Miles fine sandy loam, subsoil | .052 | .038 | 37 | .69 | .39 | 259 | .27 | .65 | .34 | 7.6 | 7–18 |
| 35064 | Miles fine sandy loam, surface | .091 | .040 | 68 | 1.17 | .30 | 260 | 3.87 | 5.63 | .40 | 8.2 | 0–7 |
| 35065 | Miles fine sandy loam, subsoil | .089 | .042 | 59 | 1.22 | .30 | 345 | 5.37 | 8.41 | .41 | 8.1 | 7–19 |
| Average | Miles fine sandy loam, surface | .068 | .042 | 67 | 1.66 | .32 | 302 | 2.05 | 1.48 | .35 | 7.7 | ........ |
| Average | Miles fine sandy loam, subsoil | .067 | .038 | 31 | 1.51 | .35 | 290 | 2.82 | 2.17 | .38 | 7.6 | ........ |
| Average | Miles fine sandy loam, deep subsoil | .037 | .044 | 36 | 2.04 | ........ | 217 | ........ | 7.37 | ........ | 8.1 | ........ |
| 35050 | Miles loam, surface | .086 | .040 | 46 | 1.38 | .41 | 461 | .45 | ........ | .35 | 7.4 | 0–4 |
| 35051 | Miles loam, surface | .101 | .044 | 15 | 1.49 | .86 | 254 | .56 | .80 | .55 | 7.4 | 4–7 |
| 35052 | Miles loam, subsoil | .062 | .038 | 23 | 1.69 | .68 | 411 | .53 | .76 | .60 | 7.4 | 7–19 |
| 35047 | Potter loam, surface | .087 | .033 | 50 | 1.13 | .29 | 141 | 4.93 | 7.62 | .37 | 8.1 | 0–7 |
| 35048 | Potter loam, subsoil | .086 | .033 | 10 | 1.10 | .35 | 42 | 7.70 | 13.35 | .54 | 8.3 | 7–14 |
| 35049 | Potter loam, subsoil | .049 | .034 | 5 | .86 | .25 | 15 | 20.04 | 35.80 | .48 | 8.2 | 14–19 |
| 35081 | Randall clay, surface | .066 | .071 | 241 | 2.36 | ........ | 753 | ........ | 4.60 | ........ | 7.9 | 0–7 |
| 35082 | Randall clay, subsoil | .041 | .062 | 252 | 2.22 | ........ | 647 | ........ | 4.34 | ........ | 8.0 | 7–19 |
| 35037 | Roscoe clay, surface | .152 | .067 | 113 | 1.93 | .73 | 533 | 1.10 | 2.07 | .87 | 7.9 | 0–7 |
| 35038 | Roscoe clay, subsoil | .136 | .067 | 102 | 1.88 | .76 | 517 | 1.13 | 1.94 | .74 | 8.0 | 7–12 |
| 35039 | Roscoe clay, subsoil | .085 | .061 | 115 | 1.84 | .65 | 307 | 4.28 | 7.52 | .63 | 8.0 | 12–19 |

**Table 19. Analyses of soils of Scurry County (continued)**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35083 | Roscoe fine sandy loam, surface | .063 | .037 | 111 | 2.06 | .48 | 507 | .53 | .84 | .44 | 8.1 | 0–7 |
| 35084 | Roscoe fine sandy loam, subsoil | .065 | .051 | 67 | 2.01 | .60 | 351 | .59 | .90 | .58 | 7.8 | 7–19 |
| 35104 | Spur loam, surface | .091 | .098 | 516 | 1.78 | .58 | 628 | 2.60 | 4.80 | .61 | 8.4 | 0–7 |
| 35105 | Spur loam, subsoil | .067 | .078 | 402 | 1.94 | .61 | 266 | 4.55 | 7.95 | ........ | 8.2 | 7–19 |
| 35034 | Valera clay loam, surface | .131 | .050 | 44 | 1.73 | .53 | 416 | .98 | 1.44 | .56 | 8.0 | 0–7 |
| 35035 | Valera clay loam, subsoil | .124 | .052 | 18 | 1.68 | .68 | 265 | 1.02 | 7.85 | .59 | 7.6 | 7–12 |
| 35036 | Valera clay loam, subsoil | .105 | .047 | 14 | 1.64 | .57 | 176 | 5.00 | 8.41 | .70 | 8.0 | 12–19 |
| 35115 | Vernon clay, surface | .124 | .089 | 141 | 2.05 | 1.06 | 332 | 5.02 | 7.64 | 1.25 | 8.2 | 0–7 |
| 35109 | Vernon clay, subsoil | .056 | .099 | 207 | 3.17 | 1.83 | 240 | 2.86 | 4.48 | 1.71 | 7.4 | 7–19 |
| 35068 | Vernon clay loam, surface | .127 | .073 | 19 | 1.50 | .71 | 69 | 11.56 | 21.01 | .91 | 8.2 | 0–7 |
| 35069 | Vernon clay loam, subsoil | .082 | .063 | 14 | .83 | 1.72 | 55 | 13.68 | 24.99 | 1.06 | 8.4 | 7–19 |
| 35090 | Vernon clay loam, surface | .144 | .069 | 133 | 1.71 | ........ | 417 | ........ | 4.06 | ........ | 8.3 | 0–7 |
| 35091 | Vernon clay loam, subsoil | .065 | .046 | 67 | 1.72 | ........ | 299 | ........ | 6.75 | ........ | 8.4 | 7–19 |
| Average | Vernon clay loam, surface | .136 | .071 | 76 | 1.61 | .71 | 243 | 11.56 | 12.54 | .91 | 8.2 | ........ |
| Average | Vernon clay loam, subsoil | .074 | .055 | 41 | 1.28 | 1.72 | 177 | 13.68 | 15.87 | 1.06 | 8.4 | ........ |
| 35062 | Vernon very fine sandy loam, surface | .103 | .060 | 125 | 2.23 | ........ | 298 | ........ | 3.57 | ........ | 8.4 | 0–7 |
| 35063 | Vernon very fine sandy loam, subsoil | .091 | .081 | 182 | 2.24 | ........ | 112 | ........ | 8.75 | ........ | 8.3 | 7–19 |

**Table 20. Grades of constituents of surface soils of Scurry County**

| Laboratory Number | Soil type | Nitrogen | Total Phos. Acid | Active Phos. Acid | Total Potash | Acid-Soluble Potash | Active Potash | Acid-Soluble Lime | Basicity | Acid-Soluble Magnesia | pH |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | Abilene clay loam | 2 | 3 | 4 | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| Average | Abilene loam | 3 | 4 | 4 | 2 | 3 | 1 | 2 | 3 | 2 | 1 |
| Average | Miles clay loam | 3 | 3 | 4 | 1 | 2 | 1 | 2 | 3 | 2 | 2 |
| Average | Miles fine sand | 5 | 5 | 5 | 3 | 5 | 4 | 4 | 5 | 4 | 2 |
| Average | Miles fine sandy loam | 3 | 4 | 4 | 2 | 3 | 2 | 1 | 3 | 2 | 1 |
| Average | Miles loam | 3 | 4 | 4 | 2 | 2 | 2 | 2 | 3 | 2 | 2 |
| Average | Potter loam | 3 | 4 | 4 | 3 | 3 | 3 | 1 | 1 | 2 | 1 |
| 35081 | Randall clay | 3 | 3 | 2 | 1 | ........ | 1 | ........ | 2 | ........ | 1 |
| 35037 | Roscoe clay | 2 | 3 | 3 | 1 | 2 | 1 | 2 | 2 | 1 | 1 |
| 35083 | Roscoe fine sandy loam | 3 | 4 | 3 | 1 | 2 | 1 | 2 | 3 | 2 | 1 |
| 35104 | Spur loam | 3 | 3 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| 35034 | Valera clay loam | 2 | 4 | 4 | 2 | 2 | 1 | 2 | 3 | 2 | 1 |
| 35115 | Vernon clay | 2 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| Average | Vernon clay loam | 2 | 3 | 4 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| 35062 | Vernon very fine sandy loam | 3 | 3 | 3 | 1 | ........ | 2 | ........ | 2 | ........ | 1 |

**Table 21. Pot experiments on soils of Scurry County**

| Laboratory Number | Soil type and crop | Weight of crop in grams | | | | Corn possibility of plant food withdrawn, in bushels | | |
|---|---|---|---|---|---|---|---|---|
| | | With complete fertilizer | Without phosphoric acid | Without nitrogen | Without potash | Phosphoric acid | Nitrogen | Potash |
| 35116 | Abilene clay loam, surface, sorghum | | 22.8 | | | 26 | | |
| 35116 | Abilene clay loam, surface, corn | | 23.2 | | | 27 | | |
| 35117 | Abilene clay loam, subsoil, corn | 38.4 | 12.8 | | | 13 | | |
| 35117 | Abilene clay loam, subsoil, sorghum | 37.3 | 12.7 | | | 12 | | |
| 35117 | Abilene clay loam, subsoil, sudan | 35.3 | 10.9 | | | 9 | | |
| 35112 | Miles fine sand, shallow phase, surface, oats | | 8.0 | 3.7 | 13.5 | 9 | 11 | 89 |
| 35113 | Miles fine sand, shallow phase, subsoil, sudan | | 2.7 | | 21.6 | 3 | | 87 |
| 35114 | Miles fine sand, shallow phase, subsoil, sorghum | | 5.2 | | 21.5 | 4 | | 107 |
| 35114 | Miles fine sand, shallow phase, subsoil, corn | | 3.0 | | 36.2 | 4 | | 211 |
| 35110 | Miles fine sandy loam, surface, sorghum | | 37.5 | 20.8 | 36.1 | 52 | 31 | 256 |
| 35110 | Miles fine sandy loam, surface, corn | | 47.4 | 25.0 | 53.3 | 77 | 34 | 546 |
| 35111 | Miles fine sandy loam, subsoil, sorghum | | 13.7 | 6.4 | | 14 | 10 | |
| 35111 | Miles fine sandy loam, subsoil, corn | | 8.7 | 13.1 | | 10 | 16 | |
| 35115 | Vernon clay, surface, corn | 36.4 | 13.2 | | | 14 | | |
| 35115 | Vernon clay, surface, sorghum | 32.1 | 14.1 | | | 13 | | |
| 35115 | Vernon clay, surface, sudan | 28.8 | 12.0 | | | 9 | | |
| 35109 | Vernon clay, subsoil, oats | 3.0 | | 14.9 | | | 48 | |

## Soils of Wheeler County

Wheeler County comprises an area of 915 square miles in northwestern Texas on the eastern side of the Panhandle. It lies in the Rolling Plains region of Texas, and is a rolling and hilly, quickly drained, sandy plain which, in many places where the surface is unprotected, is subject to severe erosion by water and wind. Twenty-three types and phases of soil in 13 series were mapped. The most extensive soil type is the Miles fine sandy loam, which occupies 20.0 per cent of the area, followed by Miles fine sand (17.1 per cent) and Abilene loamy fine sand (15.6 per cent). Upland soils include the light-colored soils of the Miles and Enterprise series (44.9 per cent); dark-colored soils of the Abilene, Potter, Zita, and Richfield series (38.5 per cent); and red soils of the Vernon and Wichita series (10.9 per cent). Alluvial soils (4.8 per cent) include the light-colored Lincoln soils; dark-colored Spur, Sweetwater, and Randall soils; and red Yahola soils.

## Description of Soils

**Upland Soils:**

**Abilene soils**—Brown or yellowish brown topsoil grading into a dark reddish-brown or brown, friable subsoil which changes gradually into a reddish-brown, heavier deep subsoil. Covers 30.7 per cent of area.

**Enterprise soils**—The only representative of this series is the nonarable fine sand, dune phase, with a grayish-brown, loose, fine-sand topsoil grading into a yellow or reddish-yellow, loose, fine-sand subsoil which extends downward unchanged for many feet. Covers 4.7 per cent of area.

**Miles soils**—Gray or brownish-gray topsoil which grades into a light-red or reddish-yellow, sandy subsoil which grades through a short transitional zone into a dull-red, friable deep subsoil. Covers 40.2 per cent of the area, of which 17.1 per cent is covered by the nonarable fine sand.

**Potter soils**—Grayish-brown or dark-gray topsoil underlain by white or yellowish-white, chalky subsoil, which is very calcareous and contains lumps and concretions of calcium carbonate. Covers 6.5 per cent of the area, of which 2.3 per cent is the nonarable, very fine sandy loam, occurring on steeply sloping land.

**Richfield soils**—Very dark-brown or black topsoil grading through a thin transitional zone into a very dark brown or black, moderately granular but not very friable, crumbly clay subsoil, which in turn grades into a brown, cloddy, clay deep subsoil which is noncalcareous in the upper section but very calcareous in the lower section. Covers only .1 per cent of the area.

**Vernon soils**—Reddish-brown or chocolate-brown, calcareous topsoil grading into a bright-red, calcareous, granular, heavier subsoil grading into a heavy red, calcareous deep subsoil. Covers 10.7 per cent of area, of which 4.9 per cent is the nonarable, very fine sandy loam, eroded phases.

**Wichita soils**—Brown, calcareous topsoil grading quickly into a dark-red, calcareous, friable, heavy subsoil which grades into a mottled brown and yellow deep subsoil which occurs in irregular bands with various mixtures of clay, sand, and sandy loam. Covers only .2 per cent of area.

**Zita soils**—Occur in broad, smoothly undulating areas in the northwestern part of the county. A very dark brown or black, granular, noncalcareous, heavy topsoil which grades into brown, cloddy, clay subsoil underlain by a brown, calcareous, clay deep subsoil. Covers 12.0 per cent of area.

**Alluvial Soils:**

**Lincoln soils**—Brown, friable topsoil grading slowly into a subsoil of very dark gray or gray, loamy fine sand which extends to a depth of several feet. Covers 2.5 per cent of area.

**Randall soils**—Black or gray, heavy topsoil which grades into a heavy, dense, gray subsoil which extends downward several feet. This series covers only .1 per cent of the area and is nonarable.

**Spur soils**—Brown, friable, calcareous topsoil grading into a brownish-gray, calcareous subsoil which grades into a yellow, sandy deep subsoil containing some soft, chalky lumps.

**Sweetwater soils**—Dark bluish-gray or black, heavy topsoil underlain by bluish-gray or gray, heavy subsoil passing directly into dark-gray, very wet, calcareous deep soil. Covers only .4 per cent of area.

**Yahola soils**—Chocolate-brown or reddish-brown, calcareous topsoil grading into a darker-colored, calcareous subsoil which in turn grades into yellow or brownish-white, fine-sand deep subsoil. Covers .4 per cent of area.

**Composition of Soils**—Table 22 gives the analyses of the different soil types and Table 23 the grades of constituents of the surface soils. The lighter soils are deficient in nitrogen, total phosphoric acid, active phosphoric acid, acid-soluble lime, and basicity. The soils are all well supplied with total potash (Grade 1) and are moderately to well supplied with active potash (Grades 1 to 3). The basicity of the lighter soils is quite low (Grade 5), although the soils are neutral to alkaline (Grades 1 and 2) in pH.

**Pot experiments**—Results of the pot experiments are given in Table 24. Most of the soils respond to nitrogen and phosphoric acid, but do not respond to potash.

**Fertilizers**—The need of most of the soils for fertilizers carrying nitrogen and phosphoric acid is indicated. Potash fertilizers and lime are not needed except possibly on small areas or for special crops.

**Table 22. Analyses of soils of Wheeler County**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36402 | Abilene fine sandy loam, surface | .068 | .039 | 47 | 2.18 | .17 | 312 | .21 | .29 | .20 | 7.0 | 0–7 |
| 36403 | Abilene fine sandy loam, subsoil | .063 | .036 | 34 | 2.02 | .17 | 262 | .22 | .24 | .20 | 7.0 | 7–17 |
| 36404 | Abilene fine sandy loam, subsoil | .064 | .038 | 22 | 1.95 | .29 | 276 | .21 | .24 | .25 | 6.7 | 17–19 |
| 36387 | Abilene loamy fine sand, surface | .036 | .029 | 54 | 2.22 | .13 | 226 | .14 | .15 | .12 | 7.5 | 0–7 |
| 36388 | Abilene loamy fine sand, subsoil | .057 | .032 | 39 | 2.27 | .21 | 244 | .21 | .25 | .18 | 7.0 | 7–10 |
| 36390 | Abilene loamy fine sand, subsoil | .067 | .042 | 31 | 2.23 | .29 | 181 | .31 | .42 | .31 | 7.4 | 10–19 |
| 36405 | Abilene loamy fine sand, surface | .055 | .034 | 40 | 2.20 | .25 | 395 | .28 | .32 | .26 | 6.9 | 0–1 |
| 36406 | Abilene loamy fine sand, surface | .046 | .027 | 31 | 2.27 | .19 | 215 | .19 | .14 | .17 | 6.7 | 1–6 |
| 36407 | Abilene loamy fine sand, surface | .074 | .037 | 29 | 2.25 | .25 | 216 | .26 | .05 | .26 | 6.4 | 6–7 |
| 36408 | Abilene loamy fine sand, subsoil | .078 | .032 | 14 | 2.10 | .32 | 196 | .33 | .58 | .35 | 6.8 | 7–18 |
| 36409 | Abilene loamy fine sand, subsoil | .057 | .034 | 7 | 2.15 | .37 | 216 | .30 | .50 | .33 | 6.8 | 18–19 |
| 36410 | Abilene loamy fine sand, deep phase, surface | .052 | .025 | 70 | 1.86 | .12 | 147 | .16 | .24 | .15 | 6.7 | 0–7 |
| 36411 | Abilene loamy fine sand, deep phase, subsoil | .038 | .025 | 49 | 2.11 | .10 | 114 | .16 | .11 | .13 | 7.3 | 7–9 |
| 36412 | Abilene loamy fine sand, deep phase, subsoil | .029 | .018 | 37 | 2.00 | .12 | 116 | .17 | .20 | .13 | 7.5 | 9–19 |
| Average | Abilene loamy fine sand, surface | .049 | .029 | 52 | 2.11 | .16 | 216 | .18 | .19 | .17 | 7.0 | ........ |
| Average | Abilene loamy fine sand, subsoil | .055 | .031 | 30 | 2.15 | .24 | 178 | .25 | .35 | .24 | 7.1 | ........ |
| 36370 | Abilene very fine sandy loam, surface | .201 | .105 | 382 | 2.57 | .47 | 399 | 1.93 | 4.26 | .72 | 7.9 | 0–2 |
| 36366 | Abilene very fine sandy loam, surface | .184 | .093 | 329 | 2.62 | .54 | 408 | .69 | 1.99 | 1.66 | 7.3 | 2–7 |

**Table 22. Analyses of soils of Wheeler County (continued)**

| Laboratory Number | Soil type | Nitrogen Per Cent | Total Phos. Acid Per Cent | Active Phos. Acid Per Million | Total Potash Per Cent | Acid-Soluble Potash Per Cent | Active Potash Per Million | Acid-Soluble Lime Per Cent | Basicity Per Cent | Acid-Soluble Magnesia Per Cent | pH | Depth Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36389 | Abilene very fine sandy loam, subsoil | .157 | .093 | 321 | 2.66 | .53 | 254 | 1.00 | 2.78 | 1.32 | 7.8 | 7–14 |
| 36371 | Abilene very fine sandy loam, subsoil | .114 | .103 | 174 | 2.72 | .53 | 14 | 7.24 | 9.40 | 1.01 | 8.1 | 14–19 |
| 36395 | Abilene very fine sandy loam, surface | .192 | .094 | 341 | 2.22 | .46 | 539 | 1.16 | 2.13 | .68 | 7.9 | 0–3 |
| 36396 | Abilene very fine sandy loam, surface | .158 | .092 | 294 | 2.27 | .54 | 518 | .75 | 1.26 | .88 | 7.9 | 3–7 |
| 36397 | Abilene very fine sandy loam, subsoil | .122 | .091 | 303 | 2.31 | .53 | 391 | 1.59 | 2.82 | 1.00 | 8.1 | 7–14 |
| 36398 | Abilene very fine sandy loam, subsoil | .101 | .097 | 299 | 2.31 | .51 | 322 | 3.33 | 5.68 | .78 | 8.1 | 14–19 |
| Average | Abilene very fine sandy loam, surface | .184 | .096 | 337 | 2.43 | .51 | 467 | 1.14 | 2.42 | .99 | 7.8 | ........ |
| Average | Abilene very fine sandy loam, subsoil | .156 | .096 | 275 | 2.50 | .53 | 246 | 3.29 | 5.17 | 1.03 | 8.0 | ........ |
| 36413 | Lincoln loamy fine sand, surface | .126 | .073 | 184 | 2.07 | .36 | 382 | 3.28 | 5.52 | .50 | 8.1 | 0–1 |
| 36414 | Lincoln loamy fine sand, surface | .127 | .064 | 166 | 2.11 | .37 | 304 | 3.24 | 5.41 | .51 | 7.9 | 1–7 |
| 36415 | Lincoln loamy fine sand, subsoil | .083 | .043 | 135 | 2.03 | .27 | 199 | 1.92 | 3.32 | .40 | 8.3 | 7–10 |
| 36416 | Lincoln loamy fine sand, subsoil | .029 | .030 | 88 | 2.20 | .20 | 182 | 1.09 | 2.18 | .38 | 7.2 | 10–19 |
| 36392 | Miles loamy fine sand, surface | .040 | .017 | 36 | 1.86 | .10 | 108 | .13 | .14 | .10 | 7.2 | 0–7 |
| 36393 | Miles loamy fine sand, subsoil | .020 | .014 | 19 | ........ | .08 | 66 | .11 | .13 | .10 | 6.8 | 7–8½ |
| 36394 | Miles loamy fine sand, subsoil | .021 | .014 | 8 | 1.90 | .10 | 60 | .10 | .05 | .10 | 7.0 | 8½–19 |
| 36420 | Miles fine sandy loam, surface | .080 | .016 | 71 | 2.16 | .29 | 261 | .31 | .33 | .41 | 8.0 | 0–6 |
| 36421 | Miles fine sandy loam, surface | .075 | .029 | 58 | 2.17 | .30 | 171 | .30 | .30 | .43 | 7.4 | 6–7 |
| 36422 | Miles fine sandy loam, subsoil | .050 | .025 | 27 | 2.18 | .31 | 120 | .27 | .30 | .48 | 7.3 | 7–19 |
| 36369 | Miles fine sandy loam, surface | .023 | .018 | 8 | 1.71 | .08 | 86 | .10 | .20 | .09 | 7.9 | 0–7 |
| 36367 | Miles fine sandy loam, subsoil | .027 | .024 | 14 | 1.84 | .13 | 91 | .13 | .18 | .16 | 7.0 | 7–13 |
| 36373 | Miles fine sandy loam, subsoil | .048 | .020 | 8 | 1.99 | .32 | 195 | .28 | .58 | .41 | 7.1 | 13–19 |
| 36399 | Miles fine sandy loam, surface | .044 | .022 | 25 | 1.70 | .07 | 117 | .14 | .20 | .12 | 7.6 | 0–7 |
| 36400 | Miles fine sandy loam, subsoil | .022 | .013 | 8 | 1.60 | .07 | 77 | .11 | .13 | .11 | 7.3 | 7–15 |
| 36401 | Miles fine sandy loam, subsoil | .040 | .023 | 5 | 1.92 | .28 | 194 | .23 | .47 | .32 | 6.8 | 15–19 |
| Average | Miles fine sandy loam, surface | .048 | .021 | 33 | 1.86 | .15 | 140 | .18 | .24 | .21 | 7.7 | ........ |
| Average | Miles fine sandy loam, subsoil | .040 | .022 | 15 | 1.95 | .24 | 133 | .22 | .33 | .33 | 7.1 | ........ |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36372 | Vernon very fine sandy loam, surface | .136 | .081 | 115 | 2.16 | .41 | 104 | 7.19 | 12.86 | .54 | 8.1 | 0–7 |
| 36391 | Vernon very fine sandy loam, subsoil | .133 | .075 | 9 | 2.06 | .41 | 19 | 12.25 | 21.80 | .86 | 8.0 | 7–14 |
| 36368 | Vernon very fine sandy loam, subsoil | .116 | .073 | 9 | 1.86 | .46 | 15 | ........ | 28.00 | ........ | 7.7 | 14–19 |
| 36417 | Vernon very fine sandy loam, surface | .152 | .087 | 353 | 2.45 | .45 | 512 | 1.60 | 3.67 | .88 | 8.2 | 0–7 |
| 36418 | Vernon very fine sandy loam, subsoil | .141 | .090 | 161 | 2.22 | .47 | 93 | 7.77 | 15.40 | 1.67 | 8.2 | 7–10 |
| 36425 | Vernon very fine sandy loam, subsoil | .124 | .101 | 32 | 1.87 | .39 | 71 | 14.41 | 27.20 | 1.22 | 8.1 | 10–15 |
| 36419 | Vernon very fine sandy loam, subsoil | .046 | .090 | 34 | 1.43 | .39 | 73 | 24.16 | 44.10 | 2.14 | 8.3 | 15–19 |
| Average | Vernon very fine sandy loam, surface | .144 | .084 | 234 | 2.31 | .43 | 308 | 4.40 | 8.27 | .71 | 8.2 | ....... |
| Average | Vernon very fine sandy loam, subsoil | .115 | .084 | 43 | 1.90 | .43 | 48 | 13.85 | 26.90 | 1.27 | 8.0 | ....... |

**Table 23. Grades of constituents of surface soils of Wheeler County**

| Laboratory Number | Soil type | Nitrogen | Total Phos. Acid | Active Phos. Acid | Total Potash | Acid-Soluble Potash | Active Potash | Acid-Soluble Lime | Basicity | Acid-Soluble Magnesia | pH |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | Abilene loamy fine sand | 4 | 4 | 4 | 1 | 4 | 2 | 4 | 5 | 3 | 2 |
| 36402 | Abilene fine sandy loam | 3 | 4 | 4 | 1 | 4 | 2 | 3 | 5 | 3 | 2 |
| Average | Abilene very fine sandy loam | 1 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 1 |
| Average | Lincoln loamy fine sand | 2 | 3 | 3 | 1 | 3 | 2 | 1 | 1 | 2 | 1 |
| 36392 | Miles loamy fine sand | 4 | 5 | 4 | 1 | 5 | 3 | 4 | 5 | 4 | 2 |
| Average | Miles fine sandy loam | 4 | 5 | 4 | 1 | 4 | 3 | 4 | 5 | 3 | 1 |
| Average | Vernon very fine sandy loam | 2 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1 |

**Table 24. Pot experiments on soils of Wheeler County**

| Laboratory Number | Soil type and crop | Weight of crop in grams | | | | Corn possibility of plant food withdrawn, in bushels | | |
|---|---|---|---|---|---|---|---|---|
| | | With complete fertilizer | Without phosphoric acid | Without nitrogen | Without potash | Phosphoric acid | Nitrogen | Potash |
| 36387 | Abilene loamy fine sand, surface, corn | .......... | 35.3 | .......... | .......... | 44 | .......... | .......... |
| 36387 | Abilene loamy fine sand, surface, kafir | .......... | 24.1 | .......... | .......... | 25 | .......... | .......... |
| 36388 | Abilene loamy fine sand, subsoil, corn | .......... | 12.0 | .......... | .......... | 16 | .......... | .......... |
| 36390 | Abilene loamy fine sand, subsoil, corn | .......... | 4.6 | .......... | .......... | .......... | .......... | .......... |
| 36390 | Abilene loamy fine sand, subsoil, corn | .......... | 4.1 | .......... | .......... | 5 | .......... | .......... |
| 36390 | Abilene loamy fine sand, subsoil, kafir | .......... | 17.4 | .......... | .......... | 14 | .......... | .......... |
| 36366 | Abilene very fine sandy loam, subsoil, corn | 60.5 | 26.0 | 36.3 | 58.7 | 27 | 44 | 528 |
| 36366 | Abilene very fine sandy loam, subsoil, kafir | 58.7 | 33.4 | 32.4 | 58.7 | 24 | 36 | 329 |
| 36371 | Abilene very fine sandy loam, subsoil, corn | 16.5 | 7.4 | 8.2 | 29.5 | 13 | 17 | 287 |
| 36371 | Abilene very fine sandy loam, subsoil, kafir | 3.8 | 10.2 | 8.8 | 7.6 | 14 | 17 | 96 |
| 36389 | Abilene very fine sandy loam, subsoil, corn | .......... | 12.4 | 25.0 | 51.7 | 17 | 28 | 374 |
| 36389 | Abilene very fine sandy loam, subsoil, kafir | .......... | 28.0 | 10.3 | 42.2 | 22 | 12 | 263 |
| 36367 | Miles fine sandy loam, subsoil, corn | .......... | 5.1 | .......... | .......... | 6 | .......... | .......... |
| 36367 | Miles fine sandy loam, subsoil, kafir | .......... | 6.3 | .......... | .......... | 6 | .......... | .......... |
| 36369 | Miles fine sandy loam, surface, corn | .......... | 10.4 | .......... | .......... | 13 | .......... | .......... |
| 36369 | Miles fine sandy loam, surface, kafir | .......... | 14.4 | .......... | .......... | 12 | .......... | .......... |
| 36368 | Vernon very fine sandy loam, subsoil, corn | 20.5 | 1.2 | .......... | 18.5 | 1 | .......... | 185 |
| 36368 | Vernon very fine sandy loam, subsoil, kafir | 25.3 | 5.3 | .......... | 19.6 | 8 | .......... | 130 |
| 36372 | Vernon very fine sandy loam, surface, corn | 32.9 | 14.7 | 24.0 | .......... | 28 | 36 | .......... |
| 36372 | Vernon very fine sandy loam, surface, corn | 58.5 | 15.7 | 21.0 | .......... | 18 | 28 | .......... |
| 36372 | Vernon very fine sandy loam, surface, kafir | 2.4 | 4.3 | 3.7 | .......... | 17 | 21 | .......... |

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## SUMMARY

Chemical analyses and results of pot experiments on samples of typical soils from seven counties are given with condensed descriptions of the soil series. Chemical constituents in the soil are graded according to the quantity of the constituents in the soil. Most of the soils are low (Grades 4 and 5) in nitrogen and phosphoric acid. They are better supplied (Grades 1, 2, and 3) with potash. Some of the soils are low in lime and basicity (Grades 4 and 5), while others are basic and even highly calcareous (Grade 1). Some of the soils are slightly acid, but most of them are neutral to alkaline.

Pot experiments on most of the soils showed that under favorable conditions in the greenhouse most of the soils responded to the application of fertilizers containing nitrogen and phosphoric acid, but few of them responded to the application of potash.