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NATIONAL SOIL TAXONOMY HANDBOOK
430-VI
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Purpose. To distribute current amendments to Soil Taxonomy, Agriculture Handbook 436.

Effective Date. These amendments and revisions are effective when received.

Filing instructions. File this copy of the changes in the 3-ring binder with Issue No. 1 through 11. It is suggested that you keep this binder with the Soil Taxonomy volume for easy reference.

Replace 615 contents dated November 1987 with the enclosed contents dated June 1988. Replace page 615-2j dated November 1987 with page 615-2j dated June 1988 and file following page 615-2i. File pages 615.163-174 following page 615-162.

Supplementation. States and NTC's may not supplement the handbook.

Edgar A. Nelson
for

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Deputy Chief for Technology

DIST: NSTH



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615.49 Grossarenic Ochraqualfs

This amendment allows Grossarenic Ochraqualfs to be with or without the dark colors definitive for the mollic intergrade.

Page 116, first column, Grossarenic Ochraqualfs. Change to read:

"Grossarenic Ochraqualfs are like Typic Ochraqualfs except for d, with or without a or c or both, and have a sandy epipedon (loamy fine sand or coarser) >100 cm thick."

615.50 Umbraqualfs

This amendment establishes the subgroups Arenic and Grossarenic Umbraqualfs.

Page 119, first column, (Distinctions between Typic Umbraqualfs and other subgroups). Delete the period at the end of item b. (continued from page 118) and replace with "; and" and add the following item:

"c. Have texture finer than loamy fine sand in some subhorizon within 50 cm of the soil surface."

First column, delete the first two full paragraphs beginning with "The typic subgroup is . . ." and substitute the following:

"Arenic Umbraqualfs are like the Typic Umbraqualfs except for c and they have a sandy epipedon (loamy fine sand or coarser) between 50 and 100 cm thick.

Grossarenic Umbraqualfs are like Typic Umbraqualfs except for c and they have a sandy epipedon (loamy fine sand or coarser) >100 cm thick.

Description of subgroups

Typic Umbraqualfs.--The concept of Typic Umbraqualfs is fixed on soils that are loamy or clayey. They do not have a surface mantle strongly influenced by pyroclastic materials and do not have discrete nodules of iron above the argillic horizon. A thick sandy epipedon is considered abnormal and is used to define arenic and grossarenic subgroups. Typic Umbraqualfs formed largely in alluvium or in marine deposits and are not extensive in the United States.

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Arenic Umbraqualfs.--These soils have a sandy epipedon that is 50 to 100 cm thick. They occur principally in Florida in the United States but are not extensive there.

Grossarenic Umbraqualfs.--These soils have a sandy epipedon that is more than 100 cm thick. They occur principally in Florida in the United States but are not extensive there."

615.51 Natrustalfs

This amendment establishes the subgroups Aquic Arenic Natrustalfs, Arenic Natrustalfs, and Grossarenic Natrustalfs for use mainly in Texas.

Page 141, second column, Distinctions between Typic Natrustalfs and other subgroups. Change item a. to read: "a. Do not have mottles that have chroma of 2 or less within 75 cm of the soil surface . . ."

Second column, Distinctions between Typic Natrustalfs and other subgroups. Delete the word "and" at the end of item c.

Second column, Distinctions between Typic Natrustalfs and other subgroups. Delete the period at the end of item d. and replace with "; and".

Second column, Distinctions between Typic Natrustalfs and other subgroups. After item d. add item e. to read: "e. Have texture finer than loamy fine sand in some subhorizon within 50 cm of the soil surface."

Second column, Distinctions between Typic Natrustalfs and other subgroups. After Aquic Natrustalfs add the following:

Aquic Arenic Natrustalfs are like Typic Natrustalfs except for a and e, with or without b, and they have a sandy epipedon (loamy fine sand or coarser) between 50 and 100 cm thick.

Arenic Natrustalfs are like Typic Natrustalfs except for e, with or without b, and they have a sandy epipedon (loamy fine sand or coarser) between 50 and 100 cm thick.

Grossarenic Natrustalfs are like Typic Natrustalfs except for e, with or without b, and they have a sandy epipedon (loamy fine sand or coarser) >100 cm thick."

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(430-VI-NSTH, June 1988)

Page 142, first column, (Description of subgroups, Typic Natrustalfs), line 2. At the end of line 2 add the following sentences: "A thick sandy epipedon is considered abnormal and is used to define arenic and grossarenic subgroups. Surface horizons above a depth of 18 cm that, after mixing, have the color of a mollic epipedon or a plow layer that has this color are believed to indicate a transition to Mollisols and define the mollic subgroup."

First column, (Description of subgroups), Aquic Natrustalfs, line 3. Change 50 cm to 75 cm.

First column, (Description of subgroups). After description of Aquic Natrustalfs add the following:

"Aquic Arenic Natrustalfs.--These soils have mottles that have chroma of 2 or less within 75 cm of the soil surface and the mottled horizon is saturated with water at some time during the year or the soil is artificially drained. In addition, the epipedon is between 50 and 100 cm thick and has texture of loamy fine sand or coarser. The soils of this subgroup are known to be extensive locally only in Texas in the United States. Most are used for grazing. Slopes are nearly level to gently undulating, suggesting some reworking by wind, in the late Pleistocene.

Arenic Natrustalfs.--These soils are like Typic Natrustalfs except they have an epipedon between 50 and 100 cm thick that has a texture of loamy fine sand or coarser throughout its thickness. These soils are not extensive in the United States. Their slopes are nearly level to gently undulating, suggesting some reworking by wind.

Grossarenic Natrustalfs.--These soils have an epipedon that is both sandy (loamy fine sand or coarser) and more than 100 cm thick. The soils of this subgroup are extensive locally only in Texas in the United States. Most of them are used for grazing. The slopes are gently undulating to rolling, suggesting some reworking by wind during the late Pleistocene."

615.52 Durixeralfs

This amendment clarifies the distinction between Typic and Abruptic Durixeralfs.

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615.52

Page 147, second column, Distinctions between Typic Durixeralfs and other subgroups. Change item a. to read:

"a. Have an argillic horizon that has one or more of the following:

- (1) Have less than 35 percent clay in all parts, or
- (2) The increase in clay content is <15 percent (absolute) within a vertical distance of 2.5 cm or is <20 percent (absolute) within a vertical distance of 7.5 cm at the upper boundary or within some part; or
- (3) The part with more than 35 percent clay is less than 7.5 cm thick

Second column, Description of subgroups, Typic Durixeralfs, third paragraph, first sentence, change to read: "An abrupt textural change at the upper boundary or within the argillic horizon is very common . . ."

Page 148, first column, lines 3 & 4, change to read: "some subhorizon, and at the upper boundary or within the argillic horizon there is a marked increase in clay."

First column, Abruptic Haplic Durixeralfs, first sentence, change to read: ". . . and, at the upper boundary or within the argillic horizon, there is a marked increase in clay."

615.53 Haploxeralfs

This amendment allows Lithic Haploxeralfs and Lithic Mollic Haploxeralfs to be with or without the low base saturation requirements of the ultic intergrade.

Page 149, first column, Lithic Haploxeralfs, (also refer to National Soil Taxonomy Handbook issue No. 1, 615.04) change to read: "Lithic Haploxeralfs are like Typic Haploxeralfs except for c or for c and f.

First column, Lithic Mollic Haploxeralfs, (also refer to National Soil Taxonomy Handbook issue No. 1, 615.04) change to read: "Lithic Mollic Haploxeralfs are like Typic Haploxeralfs except for c and b, with or without f.

Second column, (Description of subgroups), Lithic Haploxeralfs; after the first sentence add the following sentence: "In addition, they are permitted but not required to have base saturation (by sum of cations) that is <75 percent in some subhorizon within 75 cm of the upper boundary of the argillic horizon."

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Page 150, first column, Lithic Mollic Haploxeralfs; after the first sentence add the following sentence: "These soils are also permitted but not required to have base saturation (by sum of cations) that is <75 percent in some subhorizon within 75 cm of the upper boundary of the argillic horizon."

615.54 Arents

This amendment establishes limits on the minimum amount of "fragments of diagnostic horizons" required for Arents and defines great groups based on moisture regime regimes. It also establishes a third.

Page 180, second column, Key to suborders. Change item JB. to read:

"JB. Other Entisols that have 3 percent or more, by volume, fragments of diagnostic horizons in one or more subhorizons between 25 and 100 cm below the soil surface, and the fragments are not arranged in discernible order.

Arents, p. 187"

Page 187, second column, second paragraph. Change the second paragraph to read as follows:

"The Arents form a unique suborder in that there are no typic subgroups. Subgroups of Arents are intergrades to other orders, suborders, or great groups, according to the nature of the fragments that can be identified.

Second column, definition, item 1. Change item 1 to read as follows:

"1. Have 3 percent or more, by volume, fragments of diagnostic horizons in one or more subhorizons between 25 and 100 cm below the soil surface, and the fragments are not arranged in discernible order; and"

Second column, definition. Delete Hapludollic Arents and Udalfic Arents and their definitions.

Second column, preceding Fluvents, add the following:

"Key to great groups

JBA. Arents that have an ustic soil moisture regime.

Ustarents

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615.54

JBB. Other Arents that have a xeric soil moisture regime.

Xerarents

JBC. Other Arents that have a torric soil moisture regime.

Torriarents

JBD. Other Arents.

Udarents

Torriarents

Definition

Torriarents are the Arents that have a torric soil moisture regime

Udarents

Definition

Udarents are the Arents that have an udic soil Moisture regime.

Definition of subgroups

Alfic Udarents have fragments of an argillic horizon that has base saturation (by sum of cations) that is 35 percent or more within the upper 1 m of the soil.

Mollic Udarents have fragments of a mollic epipedon within the upper 1 m of the soil.

Ustarents

Definition

Ustarents are the Arents that have an ustic soil moisture regime.

Xerarents

Definition

Xerarents are the Arents that have a xeric soil moisture regime.

Definition of subgroups

Alfic Xerarents have fragments of an argillic horizon that has base saturation (by sum of cations) that is 35 percent or more within the upper 1 m of the soil."

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(430-VI-NSTH, June 1988)

615.55 Vertic Ustifluvents

This amendment allows Vertic Ustifluvents to be with or without the dark colored surface requirements of the mollic intergrade.

Page 192, second column, Vertic Ustifluvents, change to read as follows: "Vertic Ustifluvents are like Typic Ustifluvents except for b with or without a or c, or both.

Page 193, first column, (Description of subgroups), Vertic Ustifluvents; insert the following as the third sentence: "Because there are no restrictions on the color value of Vertisols, Vertic Ustifluvents are permitted, but not required to have a lower color value than soils of the typic subgroup.

615.56 Palehumults and Haplohumults.

This amendment reestablishes Palehumults which were deleted as a result of National Soil Taxonomy Handbook Issue No. 8. At the time there were only a few series classified as Palehumults and it was believed most would meet the requirements of the new great group of Kandihumults. Some series, however, have CEC too high for a kandic horizon and better fit the "pale" concept. Also, deleting the weatherable mineral requirements for the pale great groups allowed many of the Haplohumults to be more correctly classified as Palehumults.

It also adds plinthic and ustic subgroups of Haplohumults.

Page 356, first column (Reference: NSTH issue No. 8, pages 615-81 & -82), change FBE (Haplohumults) to FBF and insert the following for FBE:

"FBE. Other Humults that have a clay distribution such that the percentage of clay does not decrease from its maximum amount by 20 percent or more within a depth of 150 cm from the soil surface or the layer in which the clay percentage decreases by more than 20 percent has at least 5 percent of the volume consisting of skeletal faces of peds and there is at least 3 percent (absolute) increase in clay below the layer.

Palehumults, p. 357"

Second column, Distinctions between Typic Haplohumults and other subgroups, add item e.:

"e. Do not have a subhorizon within 150 cm of the soil surface that has >5 percent plinthite by volume."

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615.56

Second column, Distinctions between Typic Haplohumults and other subgroups, add:

"Plinthic Haplohumults are like Typic Haplohumults except for e.
Ustic Haplohumults are like Typic Haplohumults except for b and have an ustic soil moisture regime."

Page 356-357, Description of subgroups, Typic Haplohumults, second paragraph, preceding second sentence (page 357, first column, second line), add:

"An appreciable amount of plinthite is considered abnormal and is used to define plinthic subgroups."

Second sentence, change to read:

"Ustic and xeric moisture regimes are considered abnormal but are highly significant to soil-plant relations and define the ustic and xeric subgroups respectively."

Page 357, first column, preceding Xeric Haplohumults, add:

"Plinthic Haplohumults.--These soils have a subhorizon with more than 5 percent (by volume) plinthite within 150 cm of the soil surface. These soils occur on marine terraces along the northern California coast.

Ustic Haplohumults.--These soils have an ustic soil moisture regime. They occur along the coast of California where the soil temperature regime is isomesic."

Page 358, second column, preceding Plinthohumults (Reference: NSTH issue No. 8, page 615-85), add:

"Palehumults

These are the Humults of old stable surfaces that have a thick argillic horizon. They are relatively extensive in California and Western Oregon and Washington. Like other Humults of the United States, their parent materials are mostly basic rocks or alluvium from basic rocks. All those soils have had and many still have a forest vegetation. They mostly were considered Reddish-Brown Lateritic or Yellowish-Brown Lateritic soils in the 1938 classification.

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(430-VI-NSTH, June 1988)

Definition

Palehumults are the Humults that

1. Do not have a kandic horizon;
2. Have a clay distribution such that the percentage of clay does not decrease from its maximum amount by 20 percent or more within a depth of 150 cm from the soil surface or the layer in which the clay percentage decreases by more than 20 percent has at least 5 percent of the volume consisting of skeletal faces of peds and there is at least 3 percent (absolute) increase in clay below the layer;
3. Do not have a sombric horizon within 1 m of the soil surface; and
4. Do not have plinthite that forms a continuous phase or that constitutes more than half the volume of any subhorizon within 1.25 m of the soil surface.

Distinctions between Typic Palehumults and other subgroups

Typic Palehumults are the Palehumults that

- a. Do not have the following combination of characteristics in the upper 25 cm or more of the argillic horizon:
 - (1) Mottles that have a color value, moist, of 4 or more, and chroma, moist, of 2 or less accompanied by mottles of higher chroma that are due to segregation of iron; and
 - (2) Saturation with water in the mottled zone at some time of year when the soil temperature in that zone is 5°C or more or there is artificial drainage;
- b. Have an udic moisture regime;
- c. Do not have a horizon within 150 cm of the soil surface that has >5 percent plinthite by volume; and
- d. Do not have a layer in the upper 75 cm that has texture finer than loamy fine sand, that is as much as 18 cm thick, that has a bulk density (at 1/3-bar water tension) of 0.95 g per cubic centimeter or less in the fine-earth fraction, and that has either of the following:
 - (1) A ratio of measured clay to 15-bar water (percentages) of 1.25 or less; or
 - (2) A ratio of CEC (at pH near 8) to 15-bar water of >1.5 and more exchange acidity than the sum of bases plus KCl-extractable aluminum.

Andeptic Palehumults are like Typic Palehumults except for d.

615.56

Aquic Palehumults are like Typic Palehumults except for a, with or without b or c, or both.
Plinthic Palehumults are like Typic Palehumults except for c, with or without b.
Ustic Palehumults are like Typic Palehumults except for b and have an ustic moisture regime.
Xeric Palehumults are like Typic Palehumults except for b and have a xeric moisture regime.

Description of subgroups

Typic Palehumults.--The central concept or typical subgroup of Palehumults is fixed on freely drained soils that have a udic moisture regime and do not have a recent surface mantle that is derived from pyroclastic materials and that has evidences of allophane. In the United States these soils occur in the Coast Range of California and Oregon.

Mottles of low chroma and a fluctuating level of ground water are properties shared with Aquults and define the aquic subgroup. An appreciable amount of plinthite is considered abnormal and is used to define plinthic subgroups. ustic and xeric moisture regimes are considered abnormal but are highly significant to soil-plant relations and define ustic and xeric subgroups, respectively. A surface mantle derived from pyroclastic materials characterize the andeptic subgroup.

Andeptic Palehumults.--Soils in this subgroup have a surface mantle that has low bulk density and have some amorphous clay in at least some part of the upper 75 cm of soil. They formed in materials rich in pyroclastic materials. Their slopes range from gentle to steep. These soils are used for timber production, but they are rare in the United States and occur only in small areas in the western part of the states of Oregon and Washington.

Aquic Palehumults.--These soils have mottles of low chroma, and the level of ground water fluctuates in the mottled horizons or the soils have artificial drainage. In the United States these soils occur in the Coast Range of Oregon.

Plinthic Palehumults.--These soils have more than 5 percent plinthite (by volume) in some horizon within 1.5 m of the soil surface but otherwise are similar to the soils in the typic subgroup. In the United States the soils are on marine terraces along the northern coast of California.

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Ustic Palehumults.--These soils have an ustic moisture regime. In the United States they occur along the California coast in areas of mesic and isomesic soil temperature regime.

Xeric Palehumults.--Soils in this subgroup have a xeric moisture regime but are otherwise like Typic Palehumults in defined properties. In the United States they occur in the Sierra Nevada and Coast Ranges of California and Coast Range and western Cascade Mountains of Oregon and Washington. They also occur in the Willamette Valley and Puget lowlands of Oregon and Washington, respectively."

615.57 Lithic Haploxerults

This amendment establishes the subgroup Lithic Haploxerults.

Page 373, second column, top of page; after item f. add:

"Lithic Haploxerults are like Typic Haploxerults except for b."

Second column, Description of subgroups; after paragraph on Typic Haploxerults add:

"Lithic Haploxerults.--These soils are like Typic Haploxerults except they have a lithic contact within 50 cm of the soil surface. They occur on mostly brush covered, gentle to moderately steep slopes near the coast in northern California in the United States. They are not extensive."

615.58 Addition of ashy over sandy or sandy-skeletal particle-size class.

Page 385 (and page 615-3 of National Soil Taxonomy Handbook issue No. 1), second column, strongly contrasting particle-size classes. Assign number 9 to "Ashy over sandy or sandy-skeletal" and renumber items 9-44 on pages 385 & 386 as 10-45.

615.59 Corrections

The following corrections were omitted from National Soil Taxonomy Handbook issue No. 11 but are needed as a result of the redefinition of Oxisols.

Page 179, second column, item 2.d. of definition. Delete all of item 2.d. and change 2.e. to 2.d. and 2.f. to 2.e.

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615.59

Page 227, second column, Definition. Change item 1.b. to read (delete first part):

"b. Do not have a placic horizon if it rests on a fragipan or rests on an albic horizon that rests on a fragipan;"

Page 229, second column. Change item 6. to read:

"6. To distinguish Inceptisols from Oxisols, Inceptisols must not have an oxic horizon unless it is a buried horizon."

Page 349, second column. Delete all of item 4.

National Soil Taxonomy Handbook issue No. 11, page 615-119 and pages 615-136 to 615-137. Change the spelling of "Acritorrox" to "Acrotorrox" to agree with the rules of spelling in Soil Taxonomy. The word occurs once on page 615-119, three times on page 615-136, and 6 times on page 615-137. (The spelling is correct in the third printing, 1987, of the Keys to Soil Taxonomy.)

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(430-VI-NSTH, June 1988)