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## Updated Taxonomic Classification of the Soils of the U.S. Virgin Islands<sup>1, 2</sup>

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### ABSTRACT

Updated information on the classification of the soils of the U.S. Virgin Islands is discussed. The U.S. Soil Taxonomy System is followed. A complete picture is given that facilitates the location of each series within the different categories of the system: order, sub-order, great group, sub-group, and family. An alphabetical list of series, with their classification, is provided. The following orders are present: Alfisols, Entisols, Inceptisols, Mollisols, Ultisols, and Vertisols. There are 23 established classified series. Of these, nine also occur in Puerto Rico. The type location of the remaining 14 occur in the Virgin Islands.

### INTRODUCTION

The soils of the U.S. Virgin Islands have been surveyed and mapped. A report including the three main islands of St. Croix, St. Thomas and St. John as well as the numerous smaller islands in the archipelago was published in 1970 (4). The soils have been classified following a relatively new system developed by the Soil Survey Staff of the U.S. Department of Agriculture Soil Conservation Service (5). The system attempts to provide for the classification of all the soils of the world. It was developed by a series of approximations which were tested to determine its defects and gradually to approach a workable system. The system, as finally adopted by the U.S. Department of Agriculture, is presented and discussed in a recent publication of the Soil Survey Staff (5). Also, a 1974 USDA-SCS publication presents the classification of all series mapped and described in the United States, Puerto Rico and the Virgin Islands (6).

However, this valuable reference lists all the soils of the U.S. Virgin Islands under the PR (Puerto Rico) sigla giving the impression that all

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the type locations occur in Puerto Rico, which is not so. Only 9 of the 23 series mapped in the U.S. Virgin Islands occur in Puerto Rico, where the type locations are.

The widespread acceptance of recent publications on the taxonomic classification of the soils of Puerto Rico (2, 3), and the recognized need to have a similar one of the soils of the U.S. Virgin Islands, led to the preparation of this article.

The reports available so far are not intended for beginning students of soil classification but rather are written to introduce the new system to people familiar with the system in use. Terminology and concepts have been so changed that it has become increasingly difficult for nonspecialists who need the type of information provided by soil survey reports to use them intelligently. The purpose of this paper is to present the taxonomic classification of the soils of the U.S. Virgin Islands in a simplified fashion so that agronomists, experiment station staff, extension workers, teachers of vocational agriculture, college students, progressive farmers and other agriculturalists may readily obtain the information they need without missing the fundamental aspects of the new system.

The information already published (4) is updated. The system and nomenclature have been discussed elsewhere, (2, 5). Each soil series is listed under the corresponding soil order. A complete picture is given to facilitate the location of each series within the different categories of the system: order, sub-order, great group, sub-group, and family. An alphabetical list of the series, with their classification is included to simplify the search for information.

#### PROCEDURE

Information was obtained mainly from the soil survey of the Virgin Islands of the United States (4) and from a published classification of the soils of the United States, Puerto Rico and the Virgin Islands (6). Unpublished material from the SCS Caribbean Office was also used. For the benefit of those in need of only general information, a table was prepared in which the series were grouped within the corresponding soil order. For those in need of more specific information, a table was developed indicating the placement of each series within each of the categories of the system. Information is limited to the U. S. Virgin Islands, and only the categories with representatives in the Island are mentioned. The table does not give names of orders, suborders, great groups, subgroups or families not represented locally. Thus, it is easier to manage and understand, even though the omission of nonrepresented categories results in an incomplete system. Those interested in the complete U.S. Soil Taxonomy should consult other reference material (5).

Further, the soils have been listed in alphabetical order with their classification as of the date of this publication. Thus, it is easy to locate a given soil and find the corresponding classification within the new system.

#### TAXONOMIC CLASSIFICATION OF SOILS OF THE VIRGIN ISLANDS<sup>4</sup>

Following a system consistent with the classification of soils in the United States and Puerto Rico, the soils of the Virgin Islands have been classified as shown in table 1. Alfisols, Entisols, Inceptisols, Millisols, Ultisols and Vertisols, have been recognized, i.e., six of the ten soil Orders.

TABLE 1.—*Classification of the soils of the U.S. Virgin Islands by orders*

	<i>Alfisols</i>	
Dorothea	Glynn	Lavallee
Jaucas	<i>Entisols</i>	
	<i>Inceptisols</i>	
Cornhill	Diamond	Southgate
Descalabrado	Jácana	Victory
	<i>Mollisols</i>	
Aguilita	Fredensborg	Parasol
Coamo	Hesselberg	Pozo Blanco
Cramer	Isaac	San Antón
		Sion
	<i>Ultisols</i>	
Magens		
Aguirre	<i>Vertisols</i>	<i>Fraternidad</i>

This indicates a sizeable soil variation within an area of roughly 134 sq. mi. (85,383 acres).<sup>5</sup>

In table 2 the soils of the U.S. Virgin Islands are classified according to orders, suborders, great groups, subgroups, families and series.

Alfisols are generally moist with ochric epipedons and argillic horizons with medium to high base status. There are only Ustalfs in the Virgin Islands comprising only one great group: Haplustalfs. This is further divided into Typic and Udic, the former represented by one family and one series; the latter, by two families with one series each.

<sup>4</sup> This classification is based on field laboratory work up to April 1976 and updates information on previous publication (4).

<sup>5</sup> St. Croix is 85 sq. mi.; St. Thomas, 30; and St. John, only 19.

The Entisols of the Virgin Islands are young soils that lack diagnostic horizons, other than an ochric epipedon. They do not exhibit cracks in most years. They are similar to those in the United States but together with those of Puerto Rico, they are unique in that the differences between mean summer and winter temperature is less than 5°C. They include only Psamments with the great group Ustipsamments, one subgroup, one family, one series.

Inceptisols of the Virgin Islands lack horizons of clay accumulation and include eluvial soils and others where the impact of the soil forming processes have had little impact. These soils characterize the steep, unstable slopes of the hilly and mountainous areas. They are classified in one suborder: Tropepts which include only the great group of Ustropepts. This is divided into Typic, Fluventic, Lithic Vertic and Vertic Ustropepts, each with one family and one series, and the Lithic Ustropepts with two families each with one series. The extensive shallow Descalabrado (Lithic Vertic Ustropepts), and Diamond (Lithic Ustropepts) are included in this order.

The Mollisols recognized in the Virgin Islands include only Ustolls. These are the soils with dark-colored surface horizons which include ten series classified into eight families, six subgroups, and three great groups. The San Antón soils (Cumulic Haplustolls), with over 4,000 acres, and the Coamo soils (Typic Haplustolls), with over 2100 acres, are included in this order. It also includes the very extensive Cramer soils, with almost 30,000 acres occurring mostly on slopes ranging from 12 to 60 percent.

The Ultisols seldom occur on slopes of 30 to 50 percent. Only one suborder (Ustults) is recognized in the Virgin Islands including one great group, subgroup, family and series.

The Vertisols of the Virgin Islands have many properties in common with those of the United States or other parts of the world. These are the "cracking" dark soils. They are classified as Usterts, further subdivided into Chromusterts and Pellusterts with one subgroup each (Udic in both cases), one family and one series. Both of these soils occur also in Puerto Rico where the type location has been designated (2).

There are a total of 23 established soil series in the Virgin Islands, all already classified within the new system (table 3). Of these series, 14 have been mapped and described for the first time in the Virgin Islands. The other nine were previously mapped and described in nearby Puerto Rico (2).<sup>6</sup>

<sup>6</sup> St. Croix is approximately 100 mi south-southeast of San Juan, P.R.; St. Thomas, about 40 mi east; and St. John, 2 mi east of St. Thomas.

TABLE 2.—*Classification of the soils of the U.S. Virgin Islands in all categories of the U.S. Taxonomy System*

Order	Sub-order	Great group	Sub-group	Family <sup>1</sup>	Series
Alfisols	Ustalfs	Haplustalfs	Typic Haplustalfs	Fine, mixed, isohyperthermic	Glynn
			Udic Haplustalfs	Fine, mixed, isohyperthermic	Dorothea
Entisols	Psamments	Ustipsamments	Typic Ustipsamments	Fine-loamy, mixed, isohyperthermic	Lavallee
				Carbonatic, isohyperthermic	Jaucas
Inceptisols	Trovepts	Ustropepts	Typic Ustropepts	Fine, loamy, mixed isohyperthermic	Victory
			Fluventic Ustropepts	Fine, loamy, mixed, isohyperthermic	Cornhill
			Lithic Ustropepts	Loamy, mixed, isohyperthermic	Diamond
				Loamy-skeletal, mixed isohyperthermic	Southgate
			Lithic Vertic Ustropepts	Clayey, mixed, isohyperthermic	Descalabrado
Mollisols	Ustolls	Argiustolls	Vertic Ustropepts	Fine, mixed, isohyperthermic	Jácana
			Typic Argiustolls	Fine, mixed, isohyperthermic	Coamo <sup>2</sup>
			Lithic Argiustolls	Clayey, mixed, isohyperthermic	Cramer
			Udic Argiustolls	Fine, mixed, isohyperthermic	Isaac
		Calciustolls	Typic Calciustolls	Fine-loamy, mixed, isohyperthermic	Parasol
				Loamy-skeletal, carbonatic, isohyperthermic, shallow	Aguilita <sup>3</sup>
				Loamy, carbonatic, isohyperthermic, shallow	Fredensborg
					Pozo Blanco
					Sion
			Petrocalcic Calciustolls	Clayey, mixed, isohyperthermic, shallow	Hesselberg
Ultisols	Ustults	Haplustolls	Cumulic Haplustolls	Fine-loamy, mixed, isohypermic	San Antón
		Haplustults	Oxic Haplustults	Clayey, oxidic, isohyperthermic	Magens
Vertisols	Usterts	Chromusterts	Udic Chromusterts	Very fine, montmorillonitic, isohyperthermic	Fraternidad
		Pellusterts	Udic Pellusterts	Fine, mixed, isohyperthermic	Aguirre

<sup>1</sup> The family name includes the sub-group name, e.g., Lithic Argiustolls, clayey, mixed isohyperthermic.<sup>2</sup> Formerly classified as Udic Argiustolls (3).<sup>3</sup> Formerly classified as Typic Rendolls (3).

TABLE 3.—*Listing and classification of soil series of the U.S. Virgin Islands*

Series	Family	Subgroup <sup>1</sup>
Aguilita	Loamy-skeletal, carbonatic, isohyperthermic, shallow	Typic Calciustolls
Aguirre	Fine, mixed, isohyperthermic	Udic Pellusterts
Coamo	Fine, mixed, isohyperthermic	Typic Argiustolls
Cornhill	Fine-loamy, mixed, isohyperthermic	Fluventic Ustropepts
Cramer	Clayey, mixed, isohyperthermic	Lithic Argiustolls
Descalabrado	Clayey, mixed, isohyperthermic	Lithic Vertic Ustropepts
Diamond	Loamy, mixed, isohyperthermic	Lithic Ustropepts
Dorothea	Fine, mixed, isohyperthermic	Udic Haplustalfs
Fraternidad	Very fine, montmorillonitic, isohyperthermic	Udic Chromusters
Fredensborg	Loamy, carbonatic, isohyperthermic, shallow	Typic Calciustolls
Glynn	Fine, mixed, isohyperthermic	Typic Haplustalfs
Hesselberg	Clayey, mixed, isohyperthermic, shallow	Petrocalcic Calciustolls
Isaac	Fine, mixed, isohyperthermic	Udic Argiustolls
Jácana	Fine, mixed, isohyperthermic	Vertic Ustropepts
Jaucas	Carbonatic, isohyperthermic	Typic Ustipsamments
Lavallee	Fine-loamy, mixed, isohyperthermic	Udic Haplustalfs
Magens	Clayey, oxidic, isohyperthermic	Oxic Haplustults
Parasol	Fine-loamy, mixed, isohyperthermic	Udic Argiustolls
Pozo Blanco	Loamy, carbonatic, isohyperthermic, shallow	Typic Calciustolls
San Antón	Fine-loamy, mixed, isohyperthermic	Cumulic Haplustolls
Sion	Loamy, carbonatic, isohyperthermic, shallow	Typic Calciustolls
Southgate	Loamy-skeletal, mixed, isohyperthermic	Lithic Ustropepts
Victory	Fine-loamy, mixed, isohyperthermic	Typic Ustropepts

<sup>1</sup> The Aguilita and Coamo series were formerly classified as Typic Rendolls and Udic Argiustolls, respectively (3).

## RESUMEN

Se presenta información actualizada obtenida de fuentes dispersas sobre la clasificación de los suelos de las Islas Vírgenes de los Estados Unidos. Se sigue el sistema de clasificación conocido como U.S. Soil Taxonomy. Se ofrece un cuadro completo en el cual cada serie se ubica dentro de las diversas categorías del sistema: orden, suborden, gran grupo, subgrupo y familia. Se provee una lista en orden alfabético de las series que indica la clasificación. Estos suelos se han clasificado en los siguientes órdenes: "Alfisols, Entisols, Inceptisols, Mollisols, Ultisols y Vertisols". Hay un total de 23 series establecidas y debidamente clasificadas. De éstas, nueve se encuentran también en Puerto Rico. La localización del perfil típico de las otras 14 se ubican en las Islas Vírgenes.

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