COMMENTS & LETTERS TO THE EDITOR

Letter to the Editor on "World Reference Base for Soil Resources (WRB), IUSS Endorsement, World-Wide Testing, and Validation"

This letter is submitted to inform the readership of the *Soil Science Society of America Journal* of the activities of International Union of Soil Science (IUSS) to develop a World Reference Base for Soil Resources (WRB).

It has been a matter of great concern that after 100 yr of modern soil science a generally accepted system of soil classification has not yet been universally adopted (Dudal, 1990). In order to remedy this, a working group of the IUSS has been developing a common language (the WRB) for naming the soils of the world (ISSS Working Group RB, 1998a).

The main objective of the WRB is to provide an easy means for scientists to identify, characterize, and name major types of soils. It is not meant to replace national soil classification systems, but to be a tool to foster correlation and accommodation among systems, starting with the highest categories.

The principles of the WRB were laid down in the Sofia consultation (Dudal, 1980, p. 19–20):

- The classification of soils is based on soil properties defined in terms of diagnostic horizons and characteristics, which to the greatest extent possible should be measurable and observable in the field.
- The selection of diagnostic horizons and characteristics takes into account their relationship with soil forming processes.
- Climatic parameters are not applied in the classification of soils. It is fully realized that they should be used for interpretation purposes, in dynamic combination with soil properties, but they should not be part of soil definitions.
- The reference soil units in the WRB should be representative of major soil regions so as to provide a comprehensive overview of the world's soil cover. To the extent possible and at a high level of generalization, diagnostic features should be selected which are of significance for management purposes.
- The nomenclature used to distinguish soil groups will retain terms that have been traditionally used or which can easily be introduced into current language. These terms are precisely defined in order to avoid the confusion that occurs when names are used with different connotations.

The WRB is meant to be a comprehensive classification system that may serve as a reference for the development of new or revision of existing national soil classification systems. It is comprised of two tiers of categorical detail:

1. The *Reference Base* consists of 30 reference soil groups and is limited to the first level.
2. The *WRB Classification System* consists of combinations

of a set of prefixes as unique modifiers added to the reference soil groups, allowing very precise characterization and classification of individual soil profiles.

The building-block approach is the most important innovation in the WRB. Exclusive use is made of standard definitions for each subdivision name (modifier) of a Soil Reference Group. The building blocks are the 121 uniquely defined modifiers (FAO, 1998). These building blocks are used to define the lower-level subunit. For example, to classify a reddish colored Vertisol with a calcic horizon one would follow the priority list (FAO, 1998) and note that modifiers "calcic" and "chromic" apply. Therefore, the soil is classified as a Chromic-Calcic Vertisol.

Since its endorsement by the IUSS at Montpellier in 1998, the WRB has been translated and published in French, German, Spanish, Italian, and Lithuanian. Negotiations are under way for translations into Japanese, Chinese, Russian, Arabic, Portuguese, and Indonesian. Furthermore, the WRB is currently being used as a base for restructuring a number of national soil classification systems such as in Vietnam and Australia. The IUSS Working Group RB is strongly supporting these initiatives by organizing soil correlation meetings with National Soil Science Societies (Vietnam, 1998; China, 1998; Spain, 1999; Sicily, 1999; Caucasian Georgia, 2000; Benin, 2000). The WRB has received world-wide attention through its published books: Introduction (ISSS Working Group, 1998a), Atlas (ISSS Working Group RB, 1998b), Key (FAO, 1998), and peer-reviewed publications (Sumner, 1999, p. 137–152, and Nachtergaele et al., 2000).

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