



1. Title

Volcanic Soils: Distinctive Properties and Management

2. Type

Commission Symposium: Comm. 1.3-Soil Genesis

3. Convener

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4. Rationale

Soils formed in volcanic ejecta have many distinctive physical, chemical, and mineralogical properties that are rarely found in soils derived from other parent materials. These distinctive properties are largely attributable to the formation of noncrystalline materials containing variable charge surfaces, and the accumulation of organic matter. Volcanic soils exhibit a wide range of agricultural productivity, depending on the degree or intensity of pedogenic development and the colloidal composition of the rooting zone. To maximize the productivity and ecosystem services provided by volcanic ash soils, proper management based on an understanding of the unique physical, chemical, and mineralogical properties of these soils must be practiced. The overarching goal of the symposium is to bring together global experts in volcanic soils to examine recent advances in the nature, properties and management of volcanic soils. Specific topical areas include:

- * Recent advances in understanding the distinctive physical, chemical, and mineralogical properties of volcanic soils
- * Soil attributes affecting agricultural and wildland productivity
- * Sustainable soil management practices
- * Resiliency of volcanic soils to natural and human disturbance (e.g., repeated volcanic ash deposition, wild fire, acidic deposition, land-use conversion, global climate change)
- * Restoration of degraded soils

The proposed session will address: i) advances in the genesis and characterization of the distinctive properties of volcanic ash soils; ii) how the distinctive physical, chemical, and mineralogical properties of volcanic soils affect agricultural and wildland productivity; iii) special management practices required to maintain sustainable ecosystems; iv) resiliency of volcanic ash soils to natural and human disturbances; and v) methodologies for soil and water conservation and the restoration of degraded volcanic ash soils. This symposium will provide several synergistic linkages with the associated symposium session "Microbial Biodiversity and Ecosystem Function in Volcanic Soils" that will address the microbial and biological functions of volcanic ash soils. The combination of these two sessions on volcanic soils will provide a holistic and rigorous treatment of recent advances in volcanic ash soils. The symposiums will also provide a valuable





linkage to proposed field trips that will examine volcanic soils in Jeju Province, Korea.

5. Objectives

The objectives of the session are to:

- * Discuss and exchange recent research advances in understanding the distinctive physical, chemical, and mineralogical properties of volcanic soils.
- * Identify research gaps in our understanding of volcanic soils research to set an agenda for future collaborative research by the international community.
- * Build collaborative partnerships for integrated volcanic soils research across the range of pedologic environments to inform soil and ecosystem management and determine the potential impacts of natural and human ecosystem disturbances.
- * Develop the conceptual framework for synthesis articles covering important aspect of volcanic soils.

6. Description

The special session on volcanic soils, will explore recent advances in our understanding of the many distinctive physical, chemical, and mineralogical properties of these soils. Volcanic soils exhibit a wide range of agricultural productivity, depending on the degree or intensity of pedogenic development and the colloidal composition of the rooting zone. This session will address several important aspects of volcanic soils that are important to the international community including: i) soil attributes affecting agricultural and wildland productivity, ii) sustainable soil management, iii) resiliency of volcanic ash soil to disturbance, and iv) restoration of degraded soils. This session will synergistically link with the associated session "Microbial Biodiversity and Ecosystem Function in Volcanic Soils" that addresses the microbial and biological functions of volcanic ash soils.

