Soil Resistance, Resilience and Quantification of Soil and Ecological Functions. (S05-herrick233506-Oral)

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Abstract:

Land use practices are sustainable if they result in no net loss of capacity to generate products and services. Retention of this capacity depends on soil and ecosystem resistance and resilience. Most soil properties reflect current capacity. Some reflect resistance, and rarely resilience. Consequently, we are losing production opportunities on land with low resistance but high resilience, and taking unjustified risks on land with high resistance, but low resilience. We will present and illustrate a framework and research approach for identifying and evaluating soil properties related to the capacity to maintain essential ecological functions. The framework is based on five premises: (1) Resistance and resilience depend on dynamic interactions between disturbance regime, vegetation and relatively static and dynamic soil properties. (2) New research and paradigms are required to interpret currently available properties. (3) New properties must increasingly reflect soil processes. (4) The properties must reflect ecosystem response to both chronic and episodic stressors, including extreme events. (5) Resistance and resilience must be evaluated at multiple time scales.

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