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Strategic soil fertility management for replicable technologies in Rwanda

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In the complex landscapes/soilscape like those found in the highlands of Rwanda, soil-specific fertility management and replicable technology development is a crucial issue. A pot experiment was undertaken to demonstrate the need to match soil type with appropriate inputs and the strategy to extrapolate developed technologies to analogous soil types. Using a multi-scale and nested hierarchy land system reasoning, four soil types occurring in different land units of the same watershed and eight fertilizer treatments were considered. The plant test was *Sorghum bicolor* (L.) Moench. Results showed significant differences between soil types and fertilizer treatments ($p \leq 0.001$). This confirmed the requirement of tailoring soil fertility management inputs to specific soil types in specific land positions/land units. In Akavuguto, watershed case study, both *Urusenyi* (*Entisols*) on hill tops and *Inombe* (*Ultisols*) on plateaus, the effect of lime was not significant and the control in both soil types still produced relatively high biomass yields. In *Umuyugu/Mugugu* (*Oxisols*) on back slope and *Nyiramugengeri* (*Histosols*) in the valley bottom, the effect of lime was spectacular. The response in all treatments without lime was insignificant and in the same category of mean separation with the control. In these two soil types, the best treatment was the combination of lime, farmyard manure and fertilizers. The difference in soil suitability was mainly explained by different parent materials in the different land units. The conclusion was that within the same agro-ecological zones, farmers' nomenclature for land units and soil types can be an effective communication framework to develop soil-specific technologies and transfer them into analogous soil types.

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