

Book of Abstracts

Wageningen Soil Conference 2015

'Soil Science in a Changing World'

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SOIL MAP PROVIDING BASIC INFORMATION FOR CROP AND SITE SPECIFIC WATER AND FERTILITY RECOMMENDATIONS IN ETHIOPIA

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To improve and sustain agricultural productivity in Ethiopia, crop and site specific soil water and fertility recommendations are essential. Soil maps reflecting the spatial distribution of the major agricultural soils, including their morphology and chemical and physical properties, is therefore key information. A large set of representative soil profiles was described in the field, analyzed in the laboratory and classified according to the World Reference Base for Soil Resources. Information on geology and landforms was combined with soil association distributions and the result was validated in the field. Collected soil profile data was combined with legacy soil survey data and with topsoil data from ongoing fertilizer experiments. Soil profile observations were soil and rooting depth, drainage status, color, mottling, particle size distribution, structure, consistency, pore size and presence of cutans, stones, nodules and pressure faces. Samples from each pedologically identified horizon were analyzed for texture, bulk density, pH, cation exchange capacity (CEC), exchangeable bases, electrical conductivity, organic carbon, nitrogen, phosphorus and micro-nutrients. Major identified soil types according to their landscape positions were Fluvisols, Vertisols, Cambisols, Luvisols, Nitisols, Regosols and Leptosols. Identified limitations for agricultural productivity are low contents in available phosphorus and nitrogen as well as surprisingly low organic matter contents especially in the topsoil where roots are concentrated. Manuring and mulching to provide nitrogen and application of phosphorous fertilizer are key soil fertility management recommendations to overcome deficits. Soil and water conservation on sloping to steep landscapes, preferably by hedgerows and/or grass strips, and incorporation of organic residues, are key soil water management recommendations. Soil-landscape relationships, as presented on the soil map, provided crucial basic information to guide practical, site specific soil water and fertility recommendations.