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Soil Degradation in Argan Woodlands, South Morocco

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The argan tree (Argania spinosa) populations, endemic to South Morocco, have been highly degraded. Although the argan tree is the source of the valuable argan oil and is protected by law, overbrowsing and -grazing as well as the intensification and expansion of agricultural land lead to tree and soil degradation. Young stands cannot establish themselves; undergrowth is scarce due to the semiarid/arid climate and thus, goats, sheep and dromedaries continually browse the trees. Canopy-covered areas decrease and are degraded while areas without vegetation cover between the argan trees increase.

On 30 test sites, 60 soil samples of tree and intertree areas were studied on their soil physical and chemical properties. 36 rainfall simulations and 60 single-ring infiltration measurements were conducted to measure potential differences between tree/intertree areas in their runoff/erosion and infiltration properties. Significant differences using a t-test were found for the studied parameters saturated hydraulic conductivity, pH, electric conductivity, percolation stability, total C-content, total N-content, K-content, Na-content and Mg-content. Surface runoff and soil erosion were not statistically significant, but showed similar trends due to the higher complexity of runoff formation. The soil covered by argan trees generally showed less signs of degradation than intertree areas. With ever-expanding intertree areas due to the lack of rejuvenation of argan trees a further degradation of the soil can be assumed.