

秦巴山区土壤水文性质特征分析

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摘要: 秦巴山区生态系统脆弱, 土地沙漠化、土壤侵蚀严重。区域土壤物理性质空间差异较大, 系统地认识和了解区域土壤物理性质分布特征对改善区域农业生产和脆弱生态环境具有重要意义。本文以秦巴山区东、中和西线三条南北穿越的采样带为基础, 开展不同土地利用的土壤水分特征参数的调查共 131 个个采样点。采用多种统计法, 分析秦巴山区不同土地利用下的土壤含水量、田间持水量、有效含水量和饱和含水量的变化特征及规律。秦巴山区土壤含水量均值介于 14.86%-24.53%, 田间持水量介于 19.98%-34.66%, 有效水含量介于 10.36%-18.43%, 饱和含水量介于 35.74%-44.11%。秦巴山区南北穿越三条样带在不同土地利用方式下的土壤含水量、饱和含水量和有效水含量均值均表现为草地最大, 林地较小。东线田间持水量、有效水含量和饱和含水量均在北纬 34.41° 出现低值, 中线和西线三类土壤水分参数均于北纬 32.51° 同时出现低值。田间持水量、有效水含量和饱和含水量与容重均呈极显著负相关关系, 饱和含水量随海拔梯度变化波动幅度最为明显。饱和含水量变动区间大, 波动强烈, 有效水含量较稳定变化幅度较小, 田间持水量变化幅度与饱和含水量大致保持一致, 土壤水文性质与土壤容重间存在相互作用关系, 此外降雨量对表层土壤含水量影响较大。

Analysis of Soil Hydrological Characteristics in Qinba mountain area

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Abstract: The ecosystem of Qinba mountain area is fragile, which has serious land desertification and soil erosion. Regional soil physical properties vary greatly in space, systematic understandings and analyses on the regional distribution characteristics of soil hydrological properties are of great significance to the improvements in agricultural production and ecological environment. Therefore, this study collected 131 soil samples from three north-south crossing zones in Qinba mountain area, then measured the soil physical attribute parameters based on the field investigation and laboratory analyses. The pearson correlations were analyzed by traditional statistical method. The mean values of soil moisture content in Qinba mountain area ranged between 14.86%-24.53%, which belongs to weak variability; the soil field capacity varied from 19.98%-34.66%, the soil available water contents were between 10.36%-18.43%, the saturation moisture contents varied from 35.74%-44.11%. The mean values of soil moisture content, soil field capacity and available water content were largest in grassland among all the different land use patterns of three north-south crossing zones, while the farmland had the weakest spatial variability.

There were relatively low values of soil field capacity, saturation moisture content, available water content appeared at 32.51°-33.41° North latitude. There is a highly significant negative correlation between field water holding capacity, effective water content, saturated water content, and bulk density. The fluctuation amplitude of saturated moisture content is most significant with the change of altitude. The change amplitude of field water holding capacity is roughly consistent with that of saturated moisture content. There is an interaction between soil hydrological properties and soil bulk density. In addition, rainfall has a significant impact on surface soil moisture content