

中国农耕区土壤有机质含量及其与酸碱度和容重关系

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摘要:对我国农耕区土壤有机质区域变化及其与酸碱度和容重关系进行系统分析,为耕地地力提升和改善土壤结构提供支撑。基于国家级耕地长期定位监测点 913 个,统计分析全国及 7 大区域(东北 NE、华北 NC、西北 NW、长江中游 MYR、长三角 YRD、华南 SC、西南 SW)耕层土壤有机质含量、酸碱度及容重变化特征。结果表明,全国农耕区耕层土壤有机质含量平均值为 22.4~24.8 g/kg。其中有机质含量中等偏低的监测点位占比达 72.5%。不同区域耕层土壤有机质含量差异显著($p < 0.05$),MYR 耕层土壤有机质含量显著高于其他 6 个区域。全国农耕区耕层土壤 pH 和容重平均分别为 (6.90 ± 1.20) , (1.30 ± 0.15) g/cm³。不同土壤利用方式对土壤有机质、酸碱度及容重产生影响。水田耕层土壤有机质含量显著高于旱地,旱地耕层土壤 pH 和容重则显著高于水田。亚当斯方程和指数函数分别推荐拟合土壤容重对有机质含量响应关系($R^2 = 0.09$, RMSE=0.17, $n = 759$),以及土壤 pH 对土壤有机质含量响应($R^2 = 0.16$, RMSE=1.24, $n = 886$)。全国农耕区耕层土壤有机质含量总体中等偏低,呈现出东南向西北依次降低趋势。土壤 pH 及容重与土壤有机质呈现显著的负相关关系。亚当斯模型及指数方程能较好地拟合土壤容重及 pH 对有机质的响应关系,可用于非线性插值法补充土壤容重及 pH 缺失值。

关键词:土壤有机质;国家级耕地监测点;土壤利用方式;土壤容重;土壤 pH

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Soil Organic Matter Content and Its Relationship with pH and Bulk Density in Agricultural Areas of China

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Abstract: Analysis of the regional changes of soil organic matter (SOM) and its relationship with pH and bulk density (BD) in agricultural areas of China were conducted. That would provide support for improvement of cultivated land fertility and soil structure. The characteristic of SOM changes were analyzed based on 913 national long-term monitoring sites which were carried out in 7 regions (Northeast, NE; North China, NC; Northwest, NW; Middle of Yangtze River, MYR; Yangtze River Delta, YRD; South China, SC; and Southwest, SW). Soil pH and bulk density were also evaluated. The results showed that the averaged SOM content in the agricultural cultivation areas were between 22.4 and 24.8 g/kg., and 72.5% of total monitoring

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