

## 黄土高原沟壑区不同年限苹果园土壤碳氮磷变化特征

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## Changes of orchard soil carbon, nitrogen and phosphorus in gully region of Loess Plateau

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**摘要** 管理措施是影响土壤质量演变的重要因素。分析和讨论了5、10、15年苹果园耕层(0—20 cm)和0—200 cm土壤有机碳、全氮、全磷、有效磷和硝态氮含量及其影响因素。结果表明, 5年、10年和15年的塬面苹果园表层土壤有机碳依次为7.5、6.7和6.7 g/kg; 全氮依次为0.94、0.85和0.83 g/kg; 但土壤全磷和速效磷含量随着种植年限而增加, 与5年苹果园相比, 塬面10年苹果园土壤全磷、速效磷含量分别提高了11%、60%, 并且磷素的变异性随年限而增加。坡地10年、15年和20年苹果园土壤有机碳依次为6.3、6.2和6.5 g/kg, 全氮依次为0.76、0.76和0.81 g/kg; 与10年苹果园相比, 15年苹果园土壤全磷、速效磷含量分别提高了20%、28%。土壤剖面0—80 cm内不同土地利用方式土壤碳、氮、磷含量随土层加深而降低, 80 cm以下不同利用条件苹果园土壤碳、磷含量差异不大, 氮素含量在土壤100 cm下随苹果园种植年限增加而增加。

**关键词:** 黄土高原沟壑区 果园 土壤有机碳 土壤全氮 土壤全磷 土壤有效磷 黄土高原沟壑区 果园 土壤有机碳 土壤全氮 土壤全磷 土壤有效磷

Abstract:

Management practice is an important factor for soil quality changes. Changes in SOC (soil organic C), TSN (total soil nitrogen), Total P, Olsen P and NO<sub>3</sub><sup>-</sup>-N were investigated in topsoil 0-20 cm and 0-200 cm of 5-year, 10-year, and 15-year orchard of Wangdonggou watershed in Gully Region of Loess Plateau. SOC and TSN content of topsoil in orchard changed little with planting year; however, total P and Olsen P contents significantly increased. For the orchard in the tableland, SOC is 7.5, 6.7, and 6.7 g/kg in 5-year, 10-year, and 15-year orchard, respectively, TSN is 0.94, 0.85, and 0.83 g/kg, respectively. For 15-year orchard in the tableland, total P and Olsen P increased by 11% and 60%, respectively, compared with 5-year orchard. For the orchard in the slopeland, SOC is 6.3, 6.2, and 6.5 g/kg in 10-year, 15-year, and 20-year orchard, respectively, TSN is 0.76, 0.76, and 0.81 g/kg, respectively. For 15-year orchard in the tableland, total P and Olsen P increased by 20% and 28%, respectively, compared with 10-year orchard. SOC, TSN, total P, and Olsen P in the 0-80cm soil profile decreased with depth, but SOC or total P or Olsen P content below 80cm were not significantly different. In addition, nitrate accumulation in 0-100 and 150-300cm increased significantly with planting year.

Keywords:

Received 2007-08-06;

引用本文:

杨雨林<sup>1</sup>, 郭胜利<sup>1,2\*</sup>, 马玉红, 车升国<sup>1</sup>, 孙文艺<sup>2</sup>. 黄土高原沟壑区不同年限苹果园土壤碳氮磷变化特征 [J] 植物营养与肥料学报, 2008, V14(4): 685-691

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[J] Acta Metallurgica Sinica, 2008, V14(4): 685-691

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