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黄土高原半湿润区苜蓿草地土壤氮素消耗特征研究

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Soil nitrogen consumption characteristics of alfalfa grassland in the semi-humid areas of the Loess Plateau

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摘要 本文研究了黄土高原地区生长年限分别为4a、6a、10a、12a、18a及26a苜蓿草地土壤氮素的变化特征。结果表明，在0—1000 cm土层，不同生长年限苜蓿草地土壤全氮与碱解氮含量呈现规律性的变化，即随土层深度的增加，全氮及碱解氮含量下降，350cm土层以下，变化趋势平缓。在0—200 cm土层，26a苜蓿草地全氮、碱解氮含量低于4a、6a苜蓿草地，高于10a、12a苜蓿草地；在200—1000 cm土层，土壤全氮、碱解氮含量在不同生长年限之间差异不大，表明苜蓿生长超过一定年限，土壤氮素有一定恢复，但受土壤氮素累计消耗的影响，只能使土壤上层的氮素逐步得到恢复，而深层土壤氮素难以恢复；苜蓿草地有机碳与全氮、碱解氮及C:N之间均为正相关关系。苜蓿生长6a以后，应对苜蓿草地进行合理施肥，以维持苜蓿草地氮素平衡。

关键词：

土壤有机质 土壤全氮 碱解氮 苜蓿草地 半湿润区

土壤有机质 土壤全氮 碱解氮 苜蓿草地 半湿润区

Abstract：

This paper presents a study about soil nitrogen (N) variations in the grasslands with alfalfas growing for four years, six years, ten years, twelve years, eighteen years and twenty-six years. The study showed that there were consistent change of total N and available N contents with alfalfas growing for different lengths of time in 0–1000 cm soil. Soil total N and available N contents decreased with soil depth, and tended to remain relatively constant in soils deeper than 350cm below soil surface. In 0–200 cm soil, total N and available N contents in 26a was lower than 4a and 6a, but higher than 10a and 12a. In 200–1000 cm soil, there were little difference among different treatments in total N and available N content, which further illustrated that the recovery of soil nitrogen began in upper soil and high consumption of deep-soil nitrogen in the early alfalfa growth made it difficult to recover soil nitrogen in deep soil. There were positive correlation between SOC and total N, available N and C:N. After six years of alfalfa growth, fertilization should be applied to maintain nitrogen balance in alfalfa grassland.

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