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研究报告

半干旱黄土区苜蓿草地轮作农田土壤氮、磷和有机质变化

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摘要

大田试验研究了多年生苜蓿草地轮作农田2年内的耕层土壤氮、磷养分和有机质变化.结果表明,与苜蓿连作相比,苜蓿草地轮作成农田后，土壤N和有机质消耗增加,2年中耕层土壤全氮含量平均分别下降了5.4%和19.5%、有机质下降了46.8%和28.2%,土壤全磷无显著变化；轮作提高了土壤氮、磷养分有效性及其活化率,土壤硝态氮含量2年分别提高了15.5%和159.1%、速效磷含量提高了44.5%和48.0%,差异显著.不同轮作方式对土壤养分变化有显著影响.苜蓿草地轮作后第2年,种植春小麦与种植玉米相比差异显著,种植马铃薯和休闲处理土壤养分变化幅度处于二者之间.种植春小麦能够维持农田土壤肥力生长季平衡,种植玉米增加了对土壤全氮、有机质和速效磷的消耗,土壤养分含量出现季节性下降,C/N和C/P降低.在半干旱地区多年生苜蓿草地向农田转变过程中，以轮作春小麦为宜,应避免种植玉米作物,以维持农田肥力平衡.

关键词 草田轮作；苜蓿；土壤氮；土壤磷；土壤有机质；轮作方式

分类号

Dynamics of soil nitrogen,phosphorus and organic matter in alfalfa-crop rotated farmland in semiarid area of Northwest China

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Abstract

Pasture-crop rotation is regarded as a key planting system in the semiarid area of China's Loess Plateau.This paper studied the dynamics of soil nitrogen,phosphorus and organic matter within the two years of alfalfa-crop rotation.The results showed that in comparing with continuous alfalfa planting,alfalfa-crop rotation induced a decline of soil total nitrogen and organic matter contents by 5.4% and 19.5%,and 46.8% and 28.2%, respectively, in the first and second year,but no significant difference was found in soil total phosphorus.Soil nutrient availability was improved due to the rotation.In the first and second year of rotation,soil nitrate nitrogen and available phosphorus contents

increased by 15.5% and 159.1%,and 44.5% and 48.0%,respectively.Planting spring wheat could maintain soil fertility,the second was fallow and planting potato,while planting corn accelerated the depletion of soil total nitrogen,organic matter and available phosphorus.As a result,in the alfalfa-crop rotation,planting spring wheat could be more available to the maintenance of soil fertility.

Key words

Pasture-crop rotation *Medicago sativa* Soil nitrogen Soil phosphorus Soil organic matter Rotation pattern

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