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Abstract	In This paper, the miscellaneous tree low-quality forest and Oak low-quality forest in the Greater Hinggan Mountains region were transformed inductively by planting Siberian Korean pine, Mongolica, and Larch, respectively. With the method of using different bandwidth and gap area, the soil nutrient characteristics were changed. The results indicated that the pH of soil increased slightly by different ways of induced transformation, but the variance was not significant ($P < 0.05$). After reforming the induced soil organic matter content was balanced, while the basic content of hydrolysable nitrogen increased, and the availiable phosphorus decreased. Soil rapidly-available potassium content in Oak coppice was reduced but raised in the region of secondary performed miscellaneous wood. The variation coefficient of Siberia Korean pine was the largest with different soil pH value of various bandwidth and soil nutrient content (except for availiable phosphorus). Content of soil organic matter and hydrolysis nitrogen, phosphorus and potassium content are significantly positive correlated. At the same time, clear-cutting bandwidth and soil organic matter and hydrolysis nitrogen content are significantly negative correlated. During the transformation of forest gap in the sunny and shady slope, smaller area of forest gap owed the larger soil nutrient content. Generally, soil nutrient content in sunny slope is higher than the shady one.

First page example

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Abstract. In This paper, the miscellaneous tree low-quality forest and Oak low-quality forest in the Greater Hinggan Mountains region were transformed inductively by planting Siberian Korean pine, Mongolica, and Larch, respectively. With the method of using different bandwidth and gap area, the soil nutrient characteristics were changed. The results indicated that the pH of soil increased slightly by different ways of induced transformation, but the variance was not significant ($P < 0.05$). After reforming the induced soil organic matter content was balanced, while the basic content of hydrolysable nitrogen increased, and the availiable phosphorus decreased. Soil rapidly-available potassium content in Oak coppice was reduced but raised in the region of secondary performed miscellaneous wood. The variation coefficient of Siberia Korean pine was the largest with different soil pH value of various bandwidth and soil nutrient content (except for availiable phosphorus). Content of soil organic matter and hydrolysis nitrogen, phosphorus and potassium content are significantly positive correlated. At the same time, clear-cutting bandwidth and soil organic matter and hydrolysis nitrogen content are significantly negative correlated. During the transformation of forest gap in the sunny and shady slope, smaller area of forest gap owed the larger soil nutrient content. Generally, soil nutrient content in sunny slope is higher than the shady one.

Introduction

Low-quality Forest refers to the interference and sabotage stand system components by natural and human factors. It missed the reverse development trend and declined the crown density of large areas. Since the forest soil was corroded, the whole ecological system almost loosed the ability to recover and consequently the forest ecological benefit and economic value decrease in this area [1]. To improve the quality of forest resource, it is urgent to carry out the stand transformation. At present, many researches have focused on low-quality forest transformation. Zhang Yang et al. [2] observed seedling growth of in test sites for low-quality forest transformation in Lesser Khingan Range, and the survival and different transformation effect in horizontal, vertical orogenic belt and forest gap in low-quality forest were assessed. Zhang Tieping et al, [3] analyzed the status quo, reason and mode of transformation of Qiandongnan State low yield formation and transformation, and qualitatively proposed the principle and mode of low inefficient forest. However, at present, research of the Greater Hinggan Mountains region is few, especially for the analysis of different soil properties after reconstruction changes induced in low-quality forest had not yet discussed. Whatever measured, the soil was one of the most important factors to evaluate transform effect. Forest soil was not only the material basis of the survival tree, but also the maintaining basis of the healthy tree. The soil nutrient was the important foundation of soil fertility. It would influence and control the forest health status [4]. Therefore, understanding the forest soil nutrient characteristic changes can provide basis for the health management in time. In this study the woodland in Greater Hinggan mountains region low-quality forest reformed after different induced was choosed to be the research object. Furthermore, this paper discussed the different induced soil nutrient characteristics after reforming the change, in order to provide theoretical basis of madding efficient stand transformation pattern and realizing forest woodland by the efficient management.