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不同栽植代数杉木林养分循环的比较研究

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Comparison on nutrient cycling in different generation plantations of Chinese fir

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摘要 在全国杉木中心产区福建建瓯,选择不同栽植代数的杉木人工林,进行养分循环的比较研究,结果表明,不同栽植代数杉木林的养分循环存在差异。随栽植代数的增加,林分养分的年归还量、年吸收量及归还吸收比均呈递减趋势,表现为1代>2代,而营养元素的周转期则呈增加趋势,说明栽植代数对杉木林养分的归还量及吸收量有较大影响,多代连栽不利于杉木林地肥力的恢复。随林分年龄的增加,杉木林养分年积累量呈明显下降趋势,1代成熟林比中龄林下降14.74%,2代成熟林比中龄林下降11.86%;而杉木林养分的年归还量、年吸收量和归还吸收比则随林分年龄的增加呈增加趋势,表现为成熟林>中龄林,因此适当延长轮伐期有利于杉木林的养分归还。

关键词: 杉木 栽植代数 养分循环 地力衰退 杉木 栽植代数 养分循环 地力衰退

Abstract: Chinese fir [*Cunninghamia lanceolata* (Lamb.) Hook.], a fast-growing evergreen coniferous tree with high yield and excellent quality, is one of the most important tree species of timber plantations in South China with a planting history extending over more than 1000 years. The total plantation area of Chinese fir in China is around 9.11 million (hectors). One of the critical issues faced in Chinese fir plantation management is the decline of site productivity under traditional intensive regime, of which the imbalance of nutrients has been assumed to be one of potential causes. It is (extremely) important to understand the reasons for productivity decline in Chinese fir plantations in successive rotations in (order) to develop sustainable management of these plantations in China. In order to compare nutrient distribution and (nutrient) cycling between Chinese fir plantations of different generations and evaluate whether there is a relationship (between) nutrient availability and decline in productivity in Chinese fir plantations, nutrient cycling in different generation and age plantations of Chinese fir were studied in Jianou, Fujian Province, South China. The results showed that there were (significant) differences in nutrient cycling of different generation plantations. As the planting generation increased, annual nutrient return, absorption and (return/absorption) ratios of Chinese fir plantations declined. They were in the (sequence of) the first-generation plantations > the second-generation plantations. It indicated that successive planting was not beneficial for soil fertility recovery of Chinese fir plantation. As the stand age increased, annual nutrient return, (uptake) and return/absorption ratios of Chinese fir plantations increased. They were in the sequence of mature plantations > middle-aged plantations. Compared with the middle-aged plantations, nutrient accumulations in first-generation and (second-generation) (mature) plantations decreased by 14.74% and 11.86%,respectively. Therefore, long cutting cycle is beneficial for nutrient return of Chinese fir plantations.

Keywords:

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