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研究报告

黄土丘陵区人工沙棘林水土保持作用机理及效益

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摘要

沙棘是我国半干旱地区用于水土保持造林的主要生态-经济型树种，在“三北”地区生态环境建设中发挥重要作用.对野外试验资料分析表明，7～10龄沙棘林冠年平均截留率为8.5%， 6～10龄沙棘林地枯落物层单次可截留0.89 mm降水；沙棘林通过改善土壤理化性质，具有提高土壤入渗和抗冲性能作用，其中土壤中毛根数量是决定土壤抗冲能力的主要指标.沙棘林的水土保持作用随林龄变化明显，幼林（2～3龄）阶段的作用很小，降水特性是决定林地产流产沙量的主要因素；成林（4～5龄）阶段，产流产沙量受降水和林分生长的共同影响；成林后（6～12龄）阶段，降水特性的影响很小，林地产流产沙量维持相对稳定，年径流深与侵蚀模数分别为0.3～3.4 mm、0～6.75 t·km^{-2}.幼林至成林（2～5龄）阶段，径流含沙量急剧减少，成林后（6～12龄）阶段，径流含沙量趋于稳定，含沙量变化在0～5.09 kg·m^{-3}.

关键词 人工沙棘林；黄土丘陵区；水土保持作用；机理

分类号

Effects of artificial seabuckthorn forest on soil and water conservation in loess hilly region

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Abstract

Seabuckthorn is regarded as a main eco-economical tree species,and plays an increasing important role in eco environmental construction in Northwest, Northeast and North China.Our study on artificial seabuckthorn forest in loess hilly region showed that the average rainfall interception rate of 7～10 ages seabuckthorn canopy was 8.5%,and the litter layer of 5～10 ages seabuckthorn forest could intercept 0.89 mm rainfall.Seabuckthorn forest could improve soil infiltration and anti-strike ability through improving soil physical and chemical properties,and the numbers of its hair roots and the depth of its litter layer were the main indices of soil anti-strike ability.The effects of seabuckthorn forest on soil and water conservation increased with its increasing age.In 2～3 ages stage,the effects were weak,and the runoff and sediment were mainly affected by the characters of rainfall.In 4～5 ages stage when the forest became maturing,the annual runoff depth and annual erosion modulus were 1.8～3.2 mm and 24.64 t·km^{-2},respectively.In 6～12 ages stage when the forest matured,the runoff and sediment on seabuckthorn woodland changed slowly,the annual runoff depth and annual erosion modulus being 0.3～3.4 mm and 0～6.75 t·km^{-}

^{2},respectively, and the characters of rainfall had much less effect on them.In the stage from young (2～5 ages) to mature forest,the sediment charge in runoff changed sharply,ranged from 77.31 kg·m^{-3} to 9.12 kg·m^{-3},but in 6～12 ages stage, the sediment content in runoff changed very slowly,and the range was 0～5.09 kg·m^{-3}.

Key words

Artificial seabuckthorn forest, Loess hilly region, Soil and water conservation, Mechanism

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