

人工林不同疏伐強度作業對林地土壤水、逕流及土壤沖蝕之影響

Soil water, surface runoff, and soil erosion affected by different thinning intensity of artificial forest

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研究計畫中英文摘要：

(一) 計畫中文摘要

關鍵詞：疏伐，土壤水，土壤沖蝕

臺灣全島人工林造林地面積達四十二萬公頃，由於人工林採取密植的方式，且林相單純化，人工林生態系的生物多樣性遠甚於天然林，甚至樹冠鬱閉度高、地被植物覆蓋度不佳，對林地的微環境造成不利的影響。現今林業永續經營政策已由早期的木材生產，轉變為國土保安、生態保育、以及維護生物多樣性，因此，如何有效經營人工林生態系，改善林地微環境，乃當前的重要課題之一。人工林疏伐作業，為促進林分生長、改善林地微環境、維護生物多樣性等森林撫育作業的方式之一。以往，林分疏伐作業大都是以考慮促進林分生長為主，國內並進行相當多的疏伐影響林分生長、地被植物的相關研究。然而，疏伐作業對樹冠層產生疏開作用，增加林內穿落雨量，以及對林地產生不同程度的干擾等，對林地的土壤水、逕流、土壤沖蝕等微環境條件，產生不同程度影響的研究極為缺乏。本研究探討不同疏伐強度對森林功能的影響，選擇位於林試所蓮華池研究中心與林務局南投林區管理處五處杉木人工林試驗地，每一處試驗地依照0%、12.5%、25%、50%四種不同的疏伐強度處理，建立疏伐試驗區。於四個不同疏伐強度試驗區域內，選擇坡度、坡向類似的地點，設置長10m、寬5m 的小試區，蒐集疏伐前後試區之土壤水、逕流、土壤沖蝕等觀測資料，分析降雨時不同疏伐強度對土壤水、逕流、土壤沖蝕的影響程度，研究成果作為將來在實施疏伐作業的決策依據。

(二) 計畫英文摘要

Key words: Thinning, soil water, soil erosion.

There are about 420 thousand hectares of artificial forest in Taiwan. Because of wood supply demand in the past, artificial forest was high density stand constituted by single species. The biodiversity of artificial forest ecosystem is worse than natural forest. Also,

the ground vegetation coverage is worse than that of no advantage to forest microenvironment. In now, forest policy about forest sustainable management change from wood supply in the past to environmental protection, ecological conservation, and biodiversity maintenance. How to effectively manage artificial forest ecosystem is important issue. Thinning is the artificial forest intermediate operation method that could promote forest stand growth, improve forest microenvironment, and increase biodiversity of forest ecosystem. Traditionally, object of thinning operation is to mainly promote stand growth. Much related research about promoting stand growth and ground vegetation by thinning operation was executed. Nevertheless, seldom related research about artificial forest thinning operation, open forest canopy and disturb land surface could introduce throughfall impacting land surface, that increase soil water content, surface runoff, and soil erosion in Taiwan. The different thinning intensity of artificial forest influence soil water content, surface runoff, and soil erosion would be investigated in this study. Five experimental China fir (*Cunninghamia lanceolata*) stand location in Lienhuachi Research Center, Taiwan Forest Research Institute, and Nantou Forest District Offices, Taiwan Forestry Bureau were selected. Each experimental stand is planned with four thinning intensity are 0%, 12.5%, 25%, and 50%. Plot with length 10 m and width 5 m was set in each different thinning intensity stand considering similar topographic condition in order to investigate soil water condition, surface runoff, and soil erosion when rainfall occurred. According to the research results, different thinning intensity operation affect forest function could be understandable, and we would suggest the method and criterion of thinning operation.