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Productivity of Eucalyptus pellita in Sumatra: Acacia mangium Legacy, Response to Phosphorus, and Site Variables for Guiding Management

编号 010030804

推送时间 20210913

研究领域 [森林生态](#)

年份 2021

类型 期刊

语种 英语

标题 Productivity of Eucalyptus pellita in Sumatra: Acacia mangium Legacy, Response to Phosphorus, and Site Variables for Guiding Management

来源期刊 forest

期 第308期

发表时间 20210901

关键词 [Indonesia](#); [eucalypt and acacia plantations](#); [production](#); [multiple rotations](#); [conservative-zero-till management](#); [phosphorus response](#); [soil-stand variables](#); [adaptive management](#);

摘要

We report on experimental studies conducted in South Sumatra with interrelated objectives to (i) examine the trends in production covering 30 years, including three rotations of *Acacia mangium* followed by *Eucalyptus pellita* which replaced *A. mangium* for managing the widespread threat of diseases; (ii) understand the effects of inter-rotation slash and litter management applied to acacia (legacy effects) on *E. pellita* growth; (iii) assess the long term changes in the top soil layer arising from above; (iv) evaluate, through a network of experiments, across the landscape, the nature and extent of growth responses to additional phosphorus. This data was also used to explore some of the critical site and stand variables which determine the variations in productivity and responses to management. The current growth rates of *E. pellita* are lower than those achieved in *A. mangium*. The management-legacy effects by conserving site resources provides a sustainable base for the growth of *E. pellita*, but for further increase in productivity, additional management actions are necessary. Changes in soil pH, carbon, N and extractable P were relatively small after four rotations. Supply of P at planting gave wood volume gains at harvest, ranging from 16 to 66% across sites. The plinthite layer in the soil profile was related to productivity, with higher growth rates of *E. pellita* occurring when the plinthite was at deeper layers. There is much scope for increasing productivity per unit area in this landscape, and available knowledge can be synthesized into a package of best practices for application. Management should aim to improve the quality of inter-rotation management to ensure more than 90% survival, and fast growth rates during the first 2 years. We provide a framework for further research and for refining

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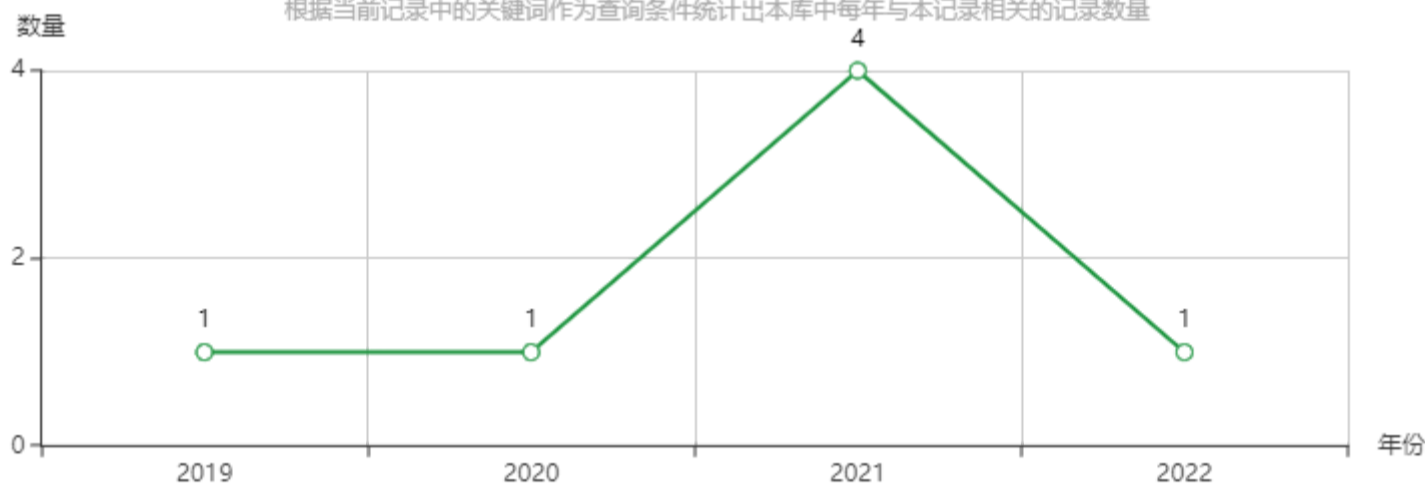
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