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## A STELLA-Based Model to Simultaneously Predict Hydrological Processes, N Uptake and Biomass Production in a Eucalyptus Plantation

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摘要	Eucalyptus is one of the fastest growing hardwoods for bioenergy production. Currently, few modeling tools exist to simultaneously estimate soil hydrological processes, nitrogen (N) uptake, and biomass production in a eucalyptus plantation. In this study, a STELLA (Structural Thinking and Experiential Learning Laboratory with Animation)-based model was developed to meet this need. After the model calibration and validation, a simulation scenario was developed to assess eucalyptus ( <i>E. grandis</i> × <i>urophylla</i> ) annual net primary production (ANPP), woody biomass production (WBP), water use efficiency (WUE), and N use efficiency (NUE) for a simulation period of 20 years. Simulation results showed that a typical annual variation pattern was predicted for water use, N uptake, and ANPP, increasing from spring to fall and decreasing from fall to the following winter. Overall, the average NUE during the growth stage was 700 kg/kg. To produce 1000 kg eucalyptus biomass, it required 114.84 m <sup>3</sup> of water and 0.92 kg of N. This study suggests that the STELLA-based model is a useful tool to estimate ANPP, WBP, WUE, and NUE in a eucalyptus plantation. <a href="#">View Full-Text</a>
服务人员	王璐
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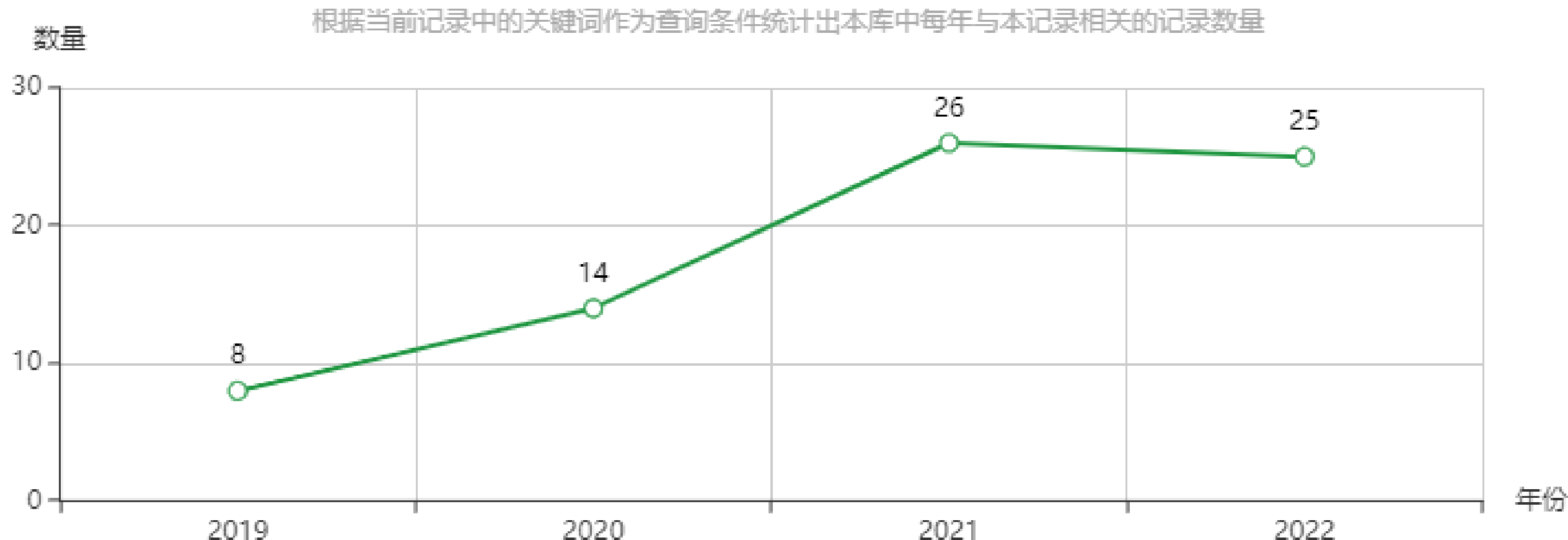
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