

Dear editor and reviewers

We thank all reviewers and editors for their thorough assessment of our manuscript and constructive feedback. All the recommended modifications have been integrated into our manuscript, highlighted in red, and the manuscript format has been switched to the Forest format. Below we provide a point-by-point response to all reviewers' comments (in blue).

Reviewers/Editor comments:

Reviewer 1

Reviewer #1 comment: Comments and Suggestions for Authors

Reviewer #1 comment1: The research carried out can be important for the choice of species in the studied area.

Response: Thank you for your thorough review of our study, we appreciate your positive feedback regarding the work of the article.

Reviewer #1 comment 2: There are numerous other researches with similar subjects, which can be found in the bibliography.

Response: Yes, although there are many similar studies, there are few studies on the effects of eucalyptus on soil hydrology in Guangxi, even though Guangxi is the largest province in China with eucalyptus forest plantings. Our research focuses on the impact of eucalyptus age and rotation on soil hydrology and physical and chemical properties in Guangxi, where eucalyptus is widely planted, providing reference value for regional scientific management of eucalyptus management.

Reviewer #1 comment 3: I ask the authors to specify what are the notable differences between the results obtained by them and other researchers.

Response: Thank you for your insightful comment. Guangxi is the largest province in China with Eucalyptus forest plantings. The management of Eucalyptus plantations is significant to the regional ecological environment. However, a few studies focused on the influence of eucalyptus

forests on soil hydrology. So, in this study, we focused on the impact of different eucalyptus forest ages and rotations on the hydrology of soil and litter.

First, In terms of water-holding capacity, the maximum soil water retention of the three forests (*Eucalyptus*, *Cunninghamia lanceolata* and *Pinus massoniana*) in our study (381.45–458.05g kg⁻¹) is significantly lower compared to other ecosystems, such as meadow ecosystems (863.82–1318.87 g kg⁻¹) [2], secondary forests, and other natural forests. (Lines 304-307). These differences in soil hydrological properties are attributed to the substantial impact of soil physicochemical properties, which are influenced by the aboveground canopy and belowground root systems of different plant types [37,38]. (Lines 307-310).

Second, we found a significant influence of Eucalyptus stand age on the soil hydrological characteristics. Specifically, as the stand ages advance, a noticeable increase in bulk density occurs ($p < 0.05$). While capillary porosity, total porosity, and water holding capacity (capillary, minimum, and maximum) significantly decrease ($p < 0.05$). This is because the increasing age of Eucalyptus forests leads to a greater demand for soil moisture by Eucalyptus trees, reducing soil moisture content and increasing soil bulk density (Lines 345 -350).

Lastly, we demonstrated that successive rotation of *Eucalyptus* forests on soil hydrological properties is increased with rotations. Our findings indicated that the 2nd rotation of Eucalyptus trees displayed superior hydrological characteristics compared to the 1st and 3rd rotations. This could be attributed to the highest total porosity in the 2nd rotation (Lines 382-384).

Reviewer #1 comment 4: Completing the conclusions with proposals regarding the degree of use of the eucalyptus species in forestry recultivation models.

Response: Thank you for your suggestions. We have refined and improved the conclusions and given reasonable suggestions (see lines 414-418).

New text: “Notably, the water-holding capacity of forest soil is a crucial indicator for assessing the ecological functions of forest ecosystems. Therefore, to balance eucalyptus production while

maximizing the hydrological function of the soil, we recommend retaining as much of the plant residues on the soil as possible and harvesting after 5-7 years of cultivation.”