We thank Dr Peaucelle for his constructive comment, that helped us producing an improved version of the manuscript.

In the following response, our answers to reviewer appear in blue. The modifications made in the new version of the manuscript are highlighted in red, and duly referenced here with line number identification.

We hope the modifications we made to the manuscript will meet the reviewer' approval.

The authors have clearly improved the clarity of the manuscript.

We thank Dr Peaucelle for his approval of our previous modifications.

I am still concerned about the aggregated RMSEtot metrics. I understand that this approach has been used in previous studies to which the authors refer. Nevertheless, I think that summing percentages with days is incorrect in the way it is presented in the manuscript.

For example, with RMSE doy = 10 days, if RMSE bp is represented between 0 and 1, RMSE tot will vary between 10 and 11. If the RMSE bp is represented between 0 and 100, the RMSE tot will vary between 10 and 110...

I would suggest to the authors to have the same units for RMSE doy and RMSE bp, as the two metrics will not have the same weight on RMSEtot.

A1: We thank Dr Peaucelle for this question. We agree with Dr Peaucelle that the unit of $RMSE_{DoY}$ and $RMSE_{BP}$ are different, which could be an issue. In order to solve this possible issue, we divided $RMSE_{DoY}$ or $RMSE_{BP}$ by the observation interval for budburst date or budburst percent, respectively. This is meant to scale the values of $RMSE_{BP}$ and $RMSE_{DoY}$, and attribute them comparable weights in the optimization procedure. We averaged the difference of DoY/BP between continuous observation for each species to obtain the observation interval based on our observation data. Then we calculated the new $RMSE_{tot}$ as followed:

$$RMSE_{tot} = \frac{RMSE_{BP}}{INT_{BP}} + \frac{RMSE_{DoY}}{INT_{DoY}} \qquad \text{(eq. 12 in the manuscript)}$$

Where INT_{BP} and INT_{DoY} are the observation interval for budburst percent and days, respectively.

INT_{BP} and INT_{DoY} measure the actual resolution of the observation data, and are thus the best achievable values in the optimization procedure. Hence, the new definition of $RMSE_{tot}$ represents the accuracy of the model in two aspects compared with observation interval. By definition of eq. 12, $RMSE_{tot}$ is now unitless.

The use of this new definition of $RMSE_{tot}$, as compared to the previous definition (where $RMSE_{tot} = RMSE_{DoY} + RMSE_{BP}$), had no influence on results for two species (Oak and Hornbeam: results were exactly the same). However, this new definition of $RMSE_{tot}$ yielded slightly different results for Chestnut. The new parameter set is actually closer to the ones obtained for the two other species. And the model predictions have generally improved for chestnut. The revised manuscript displays these new results (Fig. 2, 3, 4, 5, 6, 7; Table 2; Fig. S2, S4, S5, S7, S10; Table S1，S4, S5).

Apart from this point, I have no other comments to make on the manuscript.

Yours sincerely

Marc Peaucelle