

## ***Interactive comment on “Feedbacks between earlywood anatomy and non-structural carbohydrates affect spring phenology and wood production in ring-porous oaks” by Gonzalo Pérez-de-Lis et al.***

### **Anonymous Referee #1**

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Pérez-de-Lis et al put forth a commendable study on the correlations between NSC reserves and tree physiology, particularly xylem structure and function. This topic first within the scope of BG and presents some novel concepts. While the authors formulate conclusions to hypothesis put forth, there appear to be significant limitations in their support for hypotheses (i) and (ii) (p2, lines 38-40). The description of the experiments is adequate with some significant issues (see below). Proper credit is given to related work. The title is appropriate for the research. I urge the authors to reduce the discussion in a effort to strengthen support for their findings.

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Regarding methods, there is no indication on how DBH or tree height was measured. Correlations between DBH and tree height was not described statistically. In the methods section, the authors state that 40 trees per species were selected, but in the methods or results sections, there is no indication on sample size for NSC or anatomical measurements. Can the reader assume  $n=40$  for all comparisons?

Authors fail to account for age of the trees when estimating growth rate by measurement of DBH. Authors state that DBH scales with tree height, but no statistics are offered to justify such allometric scaling. Thus, I find it problematic to use only DBH as an indication of tree size because of the disregard to growth rates. Furthermore, calculations of BAI would be useful in correlating NSC reserves with growth rate and subsequent parameters such as EVP, bud break, latewood production, etc. . .

For the results section, comparisons are not adequately stated. Examples include: page 5 line 8 – is this comparison on NSCs combined across all sites; page 5 line 11 – the figure implies no significant difference between species at hyperhumid in the SS:starch ratio; page 5 line 12 – NSC (being a total of SS and starch) is not indicated in the figure and is this a comparison of species across all sites?; page 5 line 17 – Fig is not referenced correctly; page 5 line 18 – fig implies that hyperhumid does not differ from subhumid; page 5 line 19 – it is not clear which species are being referred to here; page 5 line 26 – clarification is needed here as to what species is being referred to for the budburst range, furthermore, are these comparisons referring to min/max, as the figure implies means of only end of March (~90 days) to early May (~130); page 5 line 27 – clarify what is being compared here; page 5 line 29 – this correlation does not appear to be consistent across all sites; page 5 line 34 – what is “ALT” referring to?

While the authors acknowledge limitations of this study, in particular the need to include more tissue types for NSC analyses and subsequent comparisons, using only stemwood NSC reserves as a proxy for hypotheses put forth in this research is possibly flawed. A primary concern is that stores of NSC reserves in the root system could have a huge impact on growth, budburst, etc, and cannot be ignored. Such analyses

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would need to be conducted in order to present this research as acceptable.

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