

## ***Interactive comment on “Contribution of previous year’s leaf N and soil N uptake to current year’s leaf growth in sessile oak” by Stephane Bazot et al.***

**Anonymous Referee #2**

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General comments The paper represents a significant contribution to the elucidation of N flows in trees. There is no new concept or method in this study but the use of three different <sup>15</sup>N-labelling periods (spring year n-1, autumn year n-1 and spring year n) and two labelling techniques (soil and leaf labelling) allows a good description of the contribution of leaves to the constitution of winter reserves and the contribution of N reserves to spring growth. It is clearly shown that the main contributor to the synthesis of new leaves is N stored during previous autumn. It is also shown that soil micro-organisms are good competitors for soil <sup>15</sup>N but a significant part of the N is returned to the tree because of microbial turnover. This is a well-written paper, and a well-thought out analysis. In my opinion, the subject and the core-content of the ms

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are appropriate and relevant to Biogeosciences. The findings are reliable because the methods developed are appropriate. I have just a problem concerning xylem and phloem measurements. Nothing is mentioned concerning phloem and xylem sampling and how the contribution of these pools to <sup>15</sup>N partitioning is estimated. Also, for obvious technical reasons, <sup>15</sup>N allocated to coarse roots and trunk is not taken in account in this study. It is known that these organs represent a substantial pool of N reserves and this should be discussed.

Specific points Abstract Line 12 is this proportion (30 %) true for all labelling periods ? Material and methods Sampling. One can understand that the authors used only two replicates for each labelling for technical reasons even if it is difficult to generalize from six trees. However, the authors should be much more accurate concerning the samplings (number of sampling per tree, soil, phloem and xylem sampling..) to improve this section and strengthen the validity of the conclusion. Results Line 144-145 There is no verb in this sentence. I presume also there is a mistake, L2: 3+4 instead of 2+3 and L3: 5+6 instead of 3+4. Discussion Line 343-348. The authors should be much more careful here. I really do not know why the authors mention the Glutamine synthetase/Glutamate synthase pathway as no results shown in the paper concern amino acid metabolism. I presume this hypothesis is based on published literature which is not mentioned. Also, the Morot-Gaudry reference is not in the reference list, and I am not sure it concerns tree physiology. I suspect there are more appropriate references concerning tree N assimilation.

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