

Interactive comment on “Does drought advance the onset of autumn leaf senescence in temperate deciduous forest trees?” by Bertold Mariën et al.

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Dear Mr. Aprile, thank you for your question.

The reader asks whether crown transparency or coloration might be used as an indicator of drought stress for management purposes. It is known that coloration is an indication of stress and that, for instance within a homogenous stand, trees with earlier coloration might be weaker than others (or will be in the future). Even dendrometric parameters (e.g. diameter) do not show this yet. In this way, the practitioner might find it useful to pay attention to trees with earlier coloration. However, the chlorophyll and pigments that make the coloration do not degrade at the same rate during autumn (e.g. see Keskitalo et al. 2005). The rate at which pigments are degraded or increased

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during the senescence process is also dependent on many environmental variables (e.g. temperature) and species-specific. Our study focuses on the detection of autumn senescence and how this can be confused by the impact of drought in some deciduous tree species. The loss of canopy greenness (or similar indices) is used to time the onset of senescence. However, at the leaf level, using chlorophyll measurements is a better indicator of the actual nutrient remobilization. The effect of the photoperiod is paramount and specific for the timing of senescence in almost all deciduous tree species. Therefore, particular crown transparency or coloration values will only partly indicate drought stress.

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