**Introduction**

**Context**

Plant phenology is the study of periodically recurring patterns of growth and development throughout a year (Piao *et al.*, 2019). Due to ~~human-induced~~ climate change, significant shifts in phenology have already been observed and are expected to continue as temperature rises (Wolkovich *et al.*, 2012). As a result, the potential growing season has extended in many ecosystems worldwide by up to 10.8 days (Körner et Basler, 2010 ; Menzel et Fabian, 1999 ; Piao *et al.*, 2019). In temperate and boreal forests, temperature plays a crucial role in setting the boundaries for the seasonal physiological activity. As spring temperature rises earlier, trees may cease this opportunity to fix more carbon and grow more during the current growing season (Keenan *et al.*, 2014 ; Wang *et al.*, 2020). However, the effects of delayed autumn in tree’s fitness are not well understood and are likely to affect the next growing season.

**Hypothesis**

I hypothesize that an extension of the growing season could modify a tree’s capacity to fill storage pools (Lawrence et Melgar, 2018).

Trees that seize this opportunity by fixing more carbon may experience increased growth in the subsequent growing season. Thus, species capable of accumulating nutrients, after leaf senescence, might exhibit growth increment in the following growing season.

**Objectives**

First, I aim to assess the trees’ innate potential to prolong or stretch their activity schedule. Secondly, I will determine whether trees can absorb nutrients beyond their theoretical growing season. Finally, I will examine if increased storage pools translate into growth increment in the following growing season.

**Methodology**

First, I will manipulate spring and autumn temperature by subjecting 10 different tree species to controlled conditions. There will be four distinct treatments, a spring or autumn warming, or both, and a control. For the nutrient enrichment treatment, liquid nutrients will be administered to the treatment trees. ~~Two sets of replicates will receive these nutrients: Cool spring - Cool autumn and Warm spring - Warm autumn.~~

Throughout the summer of 2024, we will continuously monitor radial growth using magnetic dendrometers. Additionally, phenological monitoring will be conducted. In 2025, the trees will grow in ambient temperatures. In the fall, we will assess growth on the individual (total biomass) and the cellular level (number of cells and their characteristics).

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