

Understanding relationship between BB and assimilation

Full photosynthetic capacity (typical peak for net Assimilation) didn't start until 50-70 days after BB for pedunculate oak and photosynthesis rate declined over 2 weeks after late fall senescence (??) began

Morecroft et al 2003

[Seasonal changes in the photosynthetic capacity of canopy oak \(\*Quercus robur\*\) leaves: the impact of slow development on annual carbon uptake | SpringerLink](#)

In another study, *Acer pseudoplatanus* showed no change in A rate over the growing season, while *Quercus robur* didn't reach max A rate until 50 days after BB and declined A rate at 20 days before abscission. Sycamore is a faster growing species but had significantly lower A rates in sun leaves than the Oak and the earlier growing season would not compensate for this difference. Study suggests that total leaf area may compensate for this.

Morecroft and Roberts 2002

[Photosynthesis and stomatal conductance of mature canopy Oak \(\*Quercus robur\*\) and Sycamore \(\*Acer pseudoplatanus\*\) trees throughout the growing season - Morecroft - 1999 - Functional Ecology - Wiley Online Library](#)

- This suggests to me we're seeing differences in ring vs diffuse species

Photoperiod is a stronger driver than temperature of changes in photosynthesis across a season in 23 species. Photosynthetic capacity peaks after summer solstice and declines with photoperiod decline. They did an experiment with 11 species of saplings and then looked at global models.

Baurele et al 2012

[Photoperiodic regulation of the seasonal pattern of photosynthetic capacity and the implications for carbon cycling | PNAS](#)

Increased growing season length with increasing chilling durations. Also increases in root biomass with longer chilling durations but no evidence of increases in shoot growth.

Chamberlain & Wolkovich 2020

[Late spring freezes coupled with warming winters alter temperate tree phenology and growth \(temporalecology.org\)](#)  
[chillfreeze/analyses at master · cchambe12/chillfreeze \(github.com\)](#)