

Climate Change Alters Seedling Emergence and Establishment in an Old-Field Ecosystem

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- The encroachment of trees into grasslands and abandoned fields could be altered if future climate conditions influence the successful emergence and establishment of woody plant seedlings.
- We asked if the effects of atmospheric and climatic change would alter tree seedling emergence and establishment in an old-field ecosystem.
- Seeds from three early successional tree species were introduced into constructed old-field plant communities that had been subjected for 4 years to altered temperature, precipitation, and atmospheric CO₂ regimes in the OCCAM experimental facility.
- Treatments had little effect on seedling emergence or establishment for loblolly pine and sweetgum seeds, which mature in fall and overwinter prior to emergence in early spring when soils are wet.
- Silver maple seeds, maturing in late spring, attempted to germinate and emerge when soils were drier, leading to severely reduced seedling establishment in the 'dry' treatment.
- These results suggest key interactions between seed phenology and atmospheric or climatic driving variables that will influence woody plant establishment that may ultimately affect successional trajectories resulting in forests with altered structure and function.

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