Introduction
Carbon dioxide levels in the atmosphere are rising, contributing to many global changes associated with rising temperatures. The rate of CO₂ increase may be partially counteracted by managing urban areas to increase carbon sequestration by plants by replacing turf with forest-like communities. Characterization of CO₂ uptake rate by various Michigan native and non-native species found in the Calvin College woodlot could help to inform this restoration process.

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6 \text{ CO}_2 + 6 \text{ H}_2\text{O} + \text{light energy} = \text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{ O}_2
\]

Objective
- To determine and compare total CO₂ uptake rate by leaves of 8 native and 2 invasive species found in the Calvin Fieldhouse woodlot
- To initiate a long-term restoration and monitoring program in the PE woodlot by removing buckthorn and transplanting several native species

Method
- Photosynthesis rates of plants in the woodlot were measured using a TPS-1 (PP systems) gas exchange sensor.
- Two leaves in the sun and 2 leaves in the shade were measured on each plant.
- Buckthorn was removed from parts of forested areas on Calvin’s campus, and native species were planted.

Results
Polynomial relationships describe the rate of carbon fixation as a function of light intensity. \( R^2 \) average = 0.62

Conclusions
- Only eastern redbud and bladdernut can compete with buckthorn in regards to carbon fixation.
- If desired plants are placed in high light areas, CO₂ uptake will be optimized, since WUE and LUE do not vary between species in the environments tested.
- In varied light environments, such as that found in the woodlot canopy, some species are more competitive in some light environments than others.
- Restored areas will be monitored throughout their development to determine survivorship and growth rates as a consequence of buckthorn treatments.