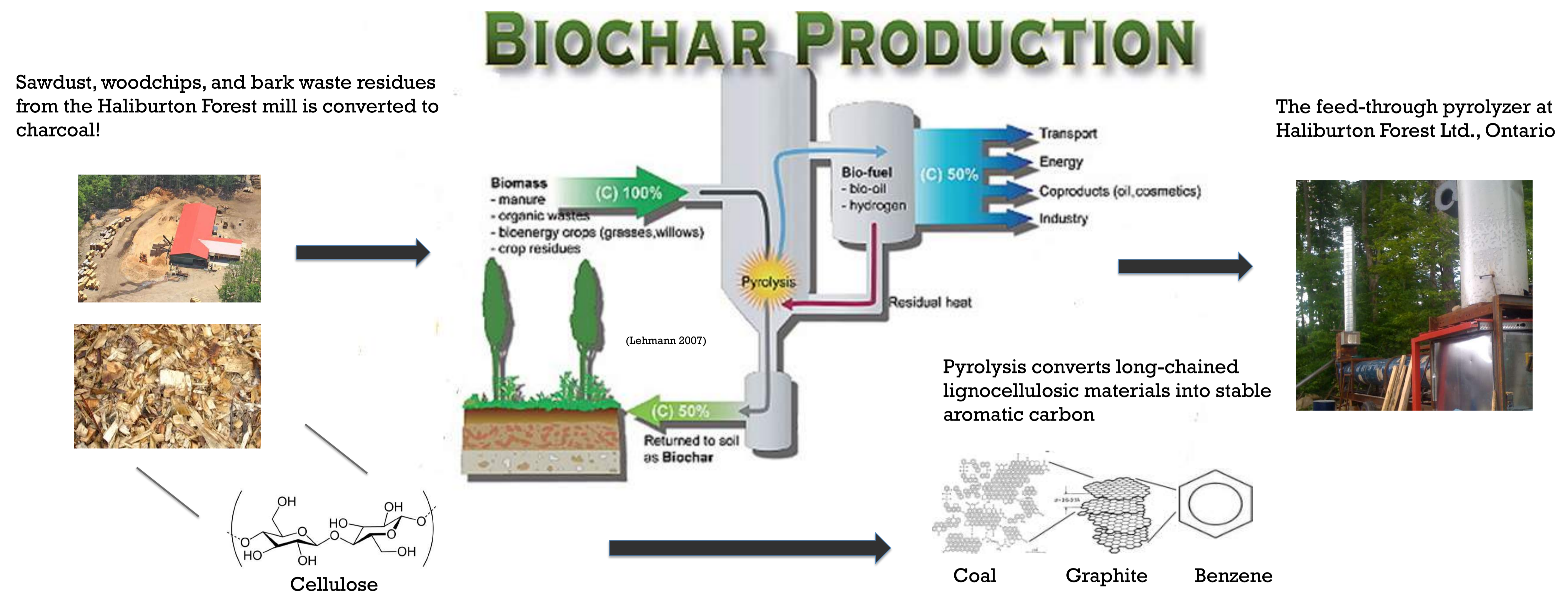




## Summary:

Charcoal used as a soil amendment, or biochar, is a climate change mitigation technology with substantial promise to ameliorate soil conditions associated with industrialization: acidification, nutrient leaching, loss of organic matter, and contamination. In a series of glasshouse studies in Toronto, Ontario, we tested the effects of pyrolyzed timber waste materials (biochar) on the growth and performance of temperate plants. Biochar soil amendments mitigated salt induced stress in a roadside herbaceous plant, facilitated succession of pioneer herbaceous plants and fire-adapted trees by enhancing growth and physiological performance. Biochar thus has considerable potential to be used as a fire disturbance mimic to restore industrialized landscapes while combating climate change.

### Biochar is produced by thermally degrading waste materials from a local timber mill

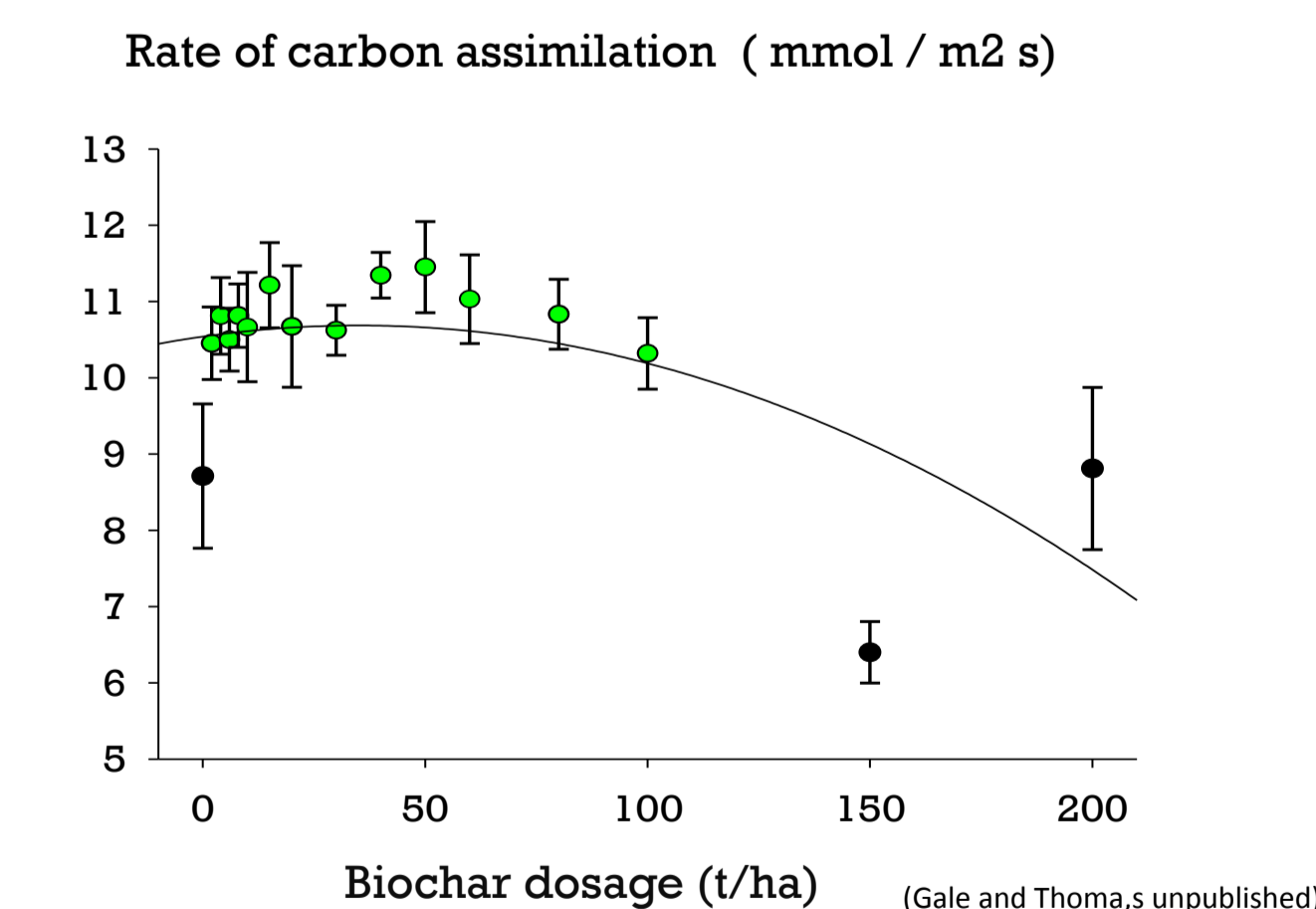


### Enhanced plant growth and performance to biochar amended soils in a series of glasshouse trials

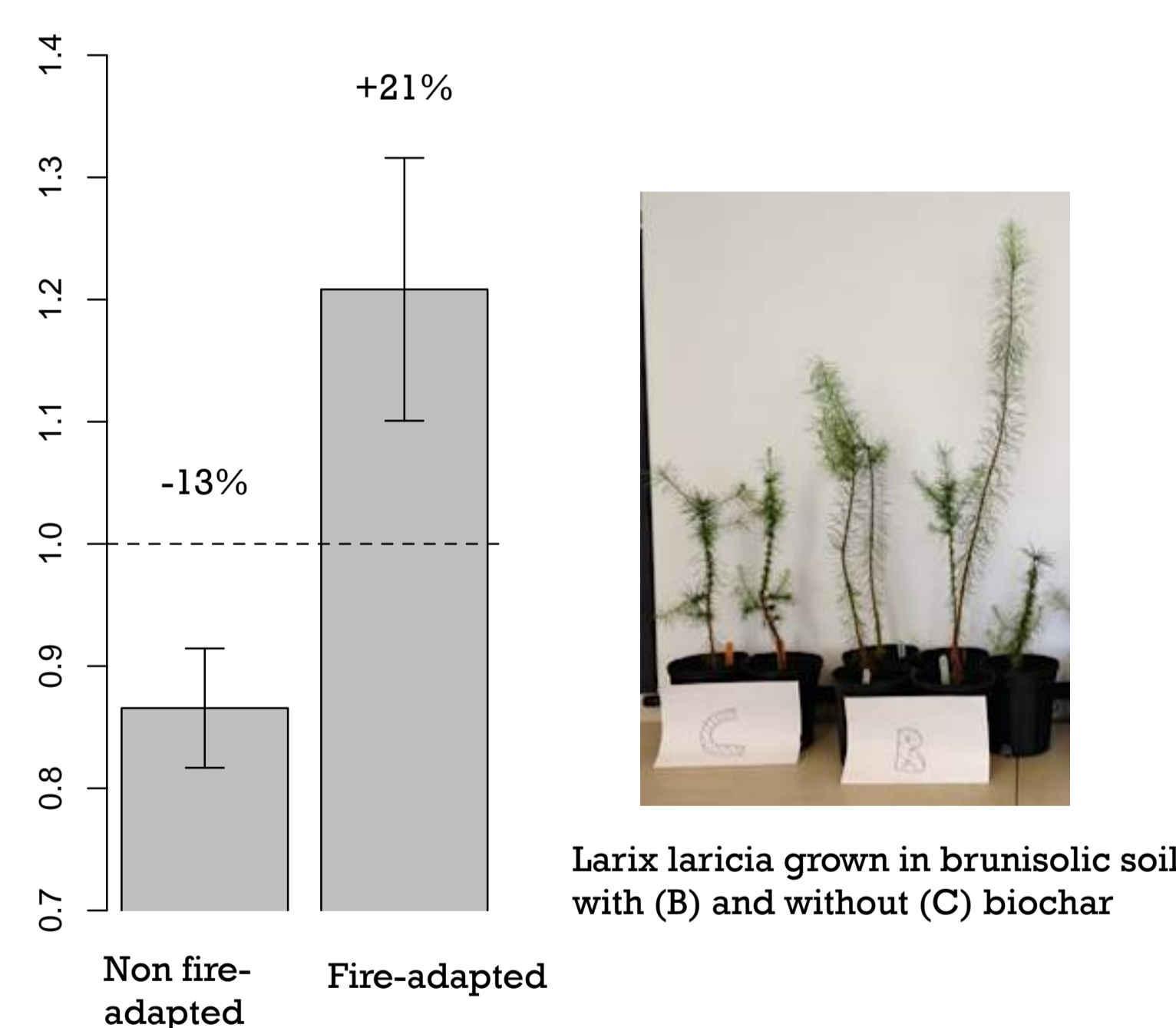
Biochar mitigates salt stress and enhances physiological performance in the herbaceous pioneer *Abutilon theophrasti*



*A. theophrasti* amended with sugar maple sawdust biochar (378°C) applied at 5 t/ha (C+5) and 50 t/ha (C+50) with roadside salt application of 30g / m<sup>2</sup> (+ salt, +C5+S, +C50+S) (Thomas et al. 2013)

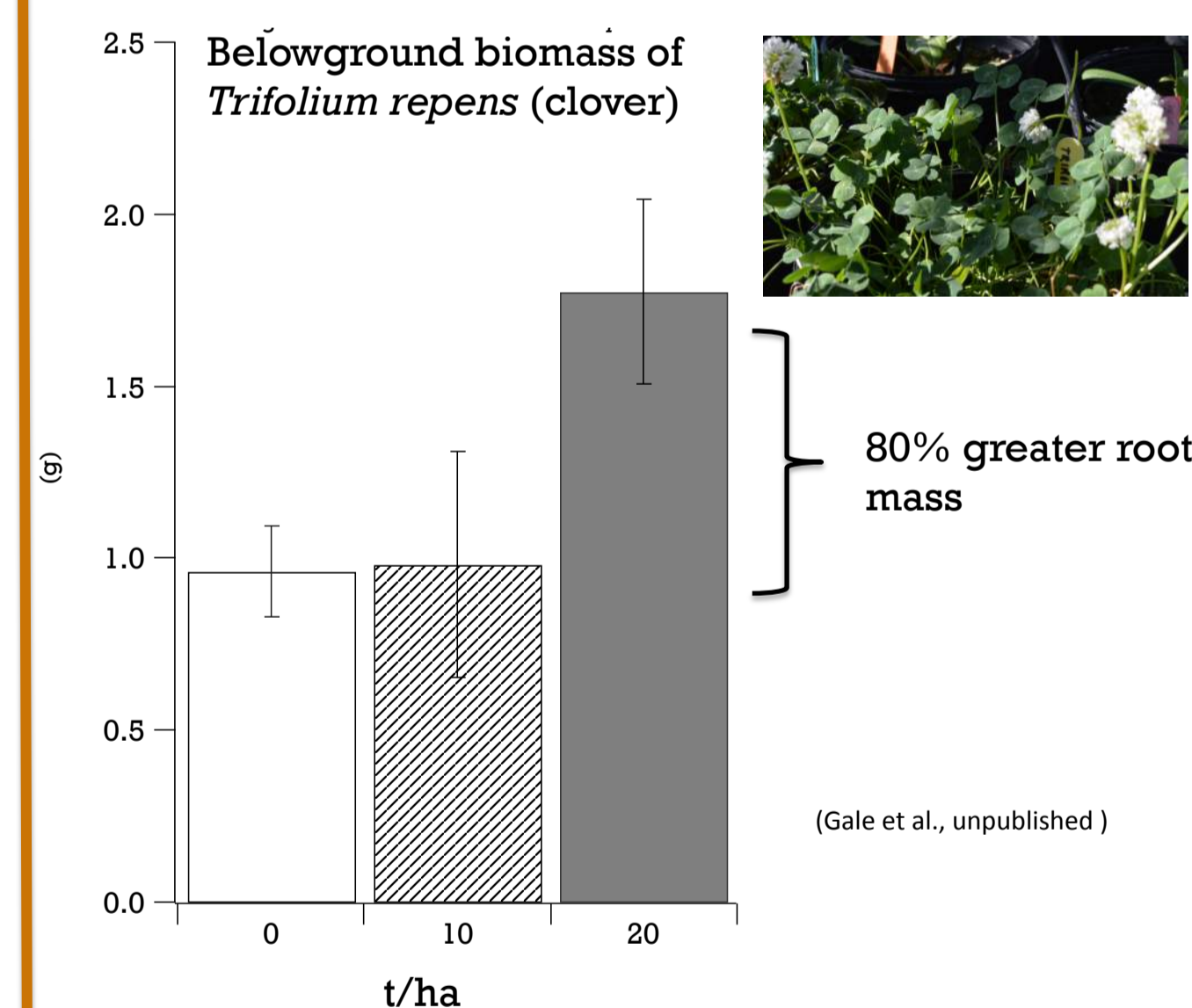


Fire-adapted tree seedlings had 21% greater biomass when grown in maple sawdust biochars



From 20 regional tree, including conifers and deciduous trees grown over 2 years (faster-growing species harvested at one year). Range of shade and drought tolerance. Biochar produced at 450°C and applied at 10/ha. (Thomas et al., unpublished)

Biochar facilitates early succession by increasing growth in herbaceous pioneers



*Tanacetum vulgare* grown in brunisolic soil with no, 10, and 20 t/ha biochar (left to right)

### Biochar should be used to ameliorate soil conditions common in the urban landscape



Mitigate road salt effects



Enhance 'street tree' performance



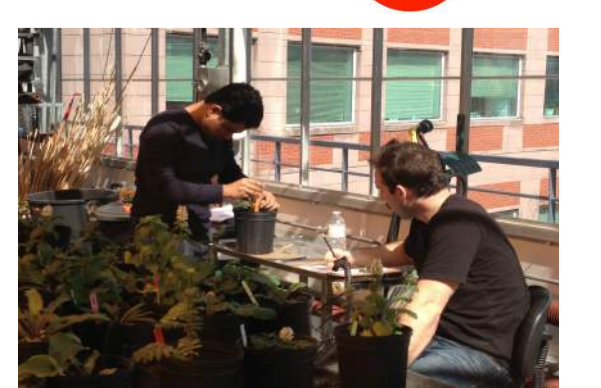
Facilitate restoration of industrialized land

**Industrial partner:**  
Haliburton Forest and Wildlife Reserve Ltd, ON

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**Other collaborators:**  
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#### Literature cited

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Lehmann, Johannes. 2007. Bio-energy in the black. *Frontiers in Ecology and the Environment* 5.7: 381-387.