Biotron Experimental Climate Change Research Facility

The Biotron Experimental Climate Change Research Facility allows researchers to perform controlled environmental studies by recreating mini ecosystems.

Climate change and environmental stresses placed by humans on plants, animals, insects and micro-organisms – and on the ecosystems in which they exist – threaten to disturb Earth on an enormous scale over the next few decades. Located at Western University, the first-of-its-kind **Biotron Experimental Climate Change Research Facility** enables researchers to reconstruct entire mini ecosystems at a scale previously unimaginable. By doing so, they are able to address complex interactions that occur among biological organisms in air, soil and water, particularly in light of climate and environmental change.

What is the Biotron?

- World-unique facility with the capacity to support an exceptional scope of controlled environment and global climate change research
- Houses separately contained, completely controlled, enclosed ecosystems that allow researchers to explore the complexities of aquatic and terrestrial ecosystems to an extent and level of control never previously attempted
- Contains eight research modules: *Biomes*, *Earth Science*, *Imaging*, *Insects*, *Microbiology*, *Plants and Algae*, *Plant Productivity* and *Transgenic Plants*
- Will lead to significant contributions in the areas of sustainable agriculture, biodiversity, biotechnologies in medicine and environmental risk management
- Provides researchers with advantages for investigating ways to encourage growth markets in medicine and agriculture in order to move toward a bioeconomy, while assessing environmental risks that may be associated with new biotechnologies
- Incorporates studies at the ecological, physiological, cellular and molecular levels, and crosses many disciplines, from earth sciences and agriculture to medicine and engineering

Research Applications

Research at the Biotron is highly applied and conducted in such critically important areas as:

- Global warming management
- Plants as bioreactors for molecular farming
- The impacts of herbicides and pesticides on food chains
- Acclimation and sustainable plant productivity
- Insect pest and vector control
- Reducing the environmental impact of metals

Highlights

- **Imaging**: High-tech imaging centre in which all analytical and imaging devices – including electron, confocal and digital light microscopes – are networked to a secure, remotely accessible central server
- **Biomes**: Six large, environmentally controlled, completely sealed biomes allowing concepts developed in laboratories or growth chambers to be precisely tested and controlled under 'real-world' simulations
- **Soil Cores**: A custom-designed, six-metre-high, controlled environment soil core system allows researchers to transport intact 10-tonne soil columns from regions as diverse as the Arctic tundra and to maintain them across extreme temperature ranges
- **Containment**: Containment Level 3 (CL3) facility for work on airborne biohazardous plant and animal pathogens

For more information, please visit: www.biotron.uwo.ca

Western Research