



## Bioproducts Discovery & Development Centre

It is estimated that the global bioplastics market is growing at more than 25% per year and experts predict that bioplastic production will exceed 50-billion pounds by 2015.



The Bioproducts Discovery and Development Centre (BDDC) is an interdisciplinary centre where plant biologists, chemists and engineers converge to investigate and commercialize biomaterials. The experts at the BDDC combine distinct areas of study including genetics, molecular biology, agronomy, materials engineering to produce leading edge research and innovative materials and chemicals derived from renewable resources. Commercial application of research results is a guiding principle for the BDDC. As a result companies working in the automotive, packaging and furniture or building materials sectors will find the BDDC a valuable partner in biomaterials, biofuels or biochemicals production.

This fully resourced facility is unique to Ontario and provides industry the opportunity to partner with university-based researchers in their exploration of new materials and processing. Innovations coming from the BDDC will help companies in their efforts to reduce greenhouse gas emissions and their environmental footprint, while helping Canada to grow its bio-economy.

A biomaterial can be defined as a processed or engineered product obtained fully or partially from renewable resources. Examples of biomaterials under this definition are natural fiber composites, bioplastic, bio-based blends, biorubber, biofoams, bioadhesives, bioink, bio-based paints and coating.

### Located at the University of Guelph, the BDDC offers an extensive array of services for companies interested in the areas of:

- Bioplastics and Bio-based Polymers
- Green Composites, Biocomposites (Natural Fibre Composites) and Polymer Blends
- Sustainable Packaging
- Bio-based Nanocomposites and Nanoblends
- Lignin reinforced thermoplastics and thermosetting polymers composites
- Value-added bio-based materials from the co-products/by-products of biofuel industries
- Biomass and Biomaterials Sustainability
- Recyclability, Durability and Biodegradability studies



## Current research includes:

- Renewable resource-based green polymers
- Bio-based nylons and polyolefins
- Petroleum-based biodegradable polymers
- Soy-based bioplastics
- Polyols from plant oils and bio-based polyurethanes
- Bio-based polyesters/epoxies
- Agricultural residues and grass fibres as reinforcing fillers
- Improved utilization of lignin, soy meal, distillers's dried grains with soluble (DDGS), canola meal and crude glycerol
- R&D on nano-metals, nano-cellulose, nano-clay and nano-structure carbons

Undertaking R&D work at the BDDC allows companies to access a full arsenal of pilot scale processing and characterization equipment including:

- Batch mixer, twin screw extruder, injection molder, micro-compounder and compressing molding, micro cast film line, kinetic mixer
- TGA, DSC, DMA, UV-Vis & FTIR spectroscopy, universal testing machines (Instron), impact tester, and GPC, GC and density meter, melt flow index
- Aerobic biodegradability testing unit (as needed for ASTM D5388)
- Electrospinning

The BDDC is staffed by graduate and post-doctoral students working in the areas of polymer science, chemical engineering, applied microbiology and advanced material science. The centre is led by Dr. Amar Mohanty – Ontario Premier's Chair in Biomaterials and Transportation. This team of researchers and technicians make the BDDC the ideal partner for companies wishing to explore new bio-based plastics and green composites to enhance their product portfolio and optimize processing technologies. Companies are assured complete confidentiality and an open approach to intellectual property. For more information visit the BDDC website at [www.bioproductscentre.com](http://www.bioproductscentre.com)



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