

Mechanical and Morphological Properties of Commercially Available, Biodegradable Plastic Films

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Research Outline

- **Objectives:**
- **Experimental**
- **Results**
- **Conclusions**
- **Impacts**

Objectives

- **Perform a series of mechanical and morphological tests on polylactic-acid (PLA) plastic films**
- **Compare the results gained by testing materials at Iowa State University to the results reported by Coretc Corp.**
- **Compare materials before and after 1 year of exposure to controlled environment.**
- **Produce a table of material properties based on testing conducted at Iowa State University.**

Experimental

Materials

- **Biobag Lawn and Leaf**
(BioBag USA)
- **Biobag Tall Kitchen**
(BioBag USA)
- **Bio-Tuf Trash Bag**
(Heritage Corp.)
- **EcoWorks 45**
(Coretc Corp.)
- **Ecofilm**
(Coretc Corp.)
- **Natur-Tec**
(Indaco)

Methods

- **ASTM D882: Tensile testing**
- **ASTM D1922: Tear propagation resistance testing**
- **ASTM D4272: Dart drop impact resistance testing**
- **Differential scanning calorimetry**
- **Thermogravimetric analysis**

Results

- **Biodegradable plastic films have displayed a wide range of material properties**
- **All the materials have shown anisotropic mechanical properties**

Conclusion

- **Biodegradable plastics have proven that they are resilient in some areas and weak in others.**
- **In order to compete with petroleum based, non-degradable plastic films, research and development in PLA bags will need to continue.**

Impacts

- **Developments in the biodegradable plastics technologies are possible**
- **Allows for a more educated consumer**
- **Sets a standard upon which other biodegradable films may be measured**