



BIODEGRADABLE NURSERY POTS FROM POULTRY FEATHERS

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Did you know?

- ✓ 1/3 lb. of a 5 pound chicken is feathers!
- ✓ More than 625 million broiler chickens per year are produced on the Delmarva Peninsula
- ✓ That's 42 Million pounds of feathers!
- ✓ Nearly four billion pounds of chicken feather waste generated by the U.S. poultry industry each year
- ✓ Feathers can be considered one of the most abundant materials in agricultural wastes



Annually about 470 million pounds non-biodegradable petroleum-based pots (or 1.8 trillion individual pots) were purchased in the U.S. by greenhouses and nurseries in 2000.

Why feather nursery pot?

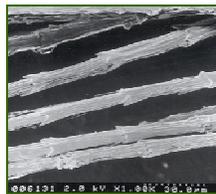
- ✓ Each spring gardeners plant seedlings in soft plastic starter trays.
- ✓ These trays are not recyclable because the chemical composition is not predictable and/or chemically incompatible with each other.
- ✓ Plastic cannot be cost-effectively cleaned for reuse and in landfills can easily last decades.
- ✓ Current pots are made from petroleum products.

Project Objective

The main purpose of this project is to develop the enabling technology that transforms poultry feathers into value-added products for biodegradable nursery pots manufacturing.

Background

More than 2 billion pounds dry feathers are available annually in the U.S. from poultry production. Presently feather meal is by far the most common end product made from feathers. Feather is entirely composed of the structural protein Keratin. As a natural biopolymer, keratin is self-sustainable, continuously renewable and biodegradable,

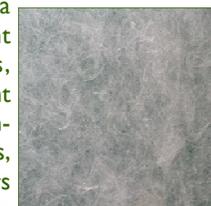


Keratin Feather Fibers



Clear Keratin Film

high surface area filters, light weight insulation mats, strong light weight protein based construction materials, composite polymers and biodegradable agricultural weed control films.



High Surface Area Air Filter

Improving product/process sustainability and profitability

Drs. Masud Huda and Walter Schmidt converted feather keratin into pellets using existing commercial polymer processing equipment, and then use advanced analytical techniques including Raman Spectroscopy and Mechanical & Thermal Analysis equipments in evaluating and in optimizing formulation composition. Inventing horticultural nursery pots formulations which can be composted and contain no petroleum-based components made for the nursery and horticultural industry is part of a Cooperative Research and Development Agreement (CRADA) with the Horticultural Research Institute.



Biodegradable Pots

Our biodegradable pots use a state of the art composite made of agricultural residues mainly poultry feathers:

- 100 % natural
- Environmentally friendly
- Biodegradable and compostable
- Non-Hygienic
- Temperature resistant
- Contemporary design and finish
- Less energy-intensive process



Potential Benefits

- * Increased value to poultry farmers for feather byproducts
- * New "green" industry created for processing feathers and producing nursery pots.
- * Decreased loads of used nursery pots to landfills.
- * Consumer-friendly biodegradable pots which may be buried during planted or composted
- * Horticulture industry benefits from customized nursery pots with different biodegradable half-lives
- * Reduced dependence on petroleum products