Plastics... and Beyond

As consumers — and, consequently, growers and retailers — show increased interest in going "green," some plastics companies are exploring biopackaging options with promising success.

By Deborah Belliveau

In our industry, it seems something of a paradox to consider the need for a "green initiative" — for a green *anything*. Growers, always creative in their growing processes, see recycling as a matter of course, reusing as an operational standard and adaptability as a way of life.

But, no matter, the fact remains that green is here, and soon the industry as a whole will take on the mantle of sustainability.

The plastic side of the industry needs to respond to the growing pressures on growers, whether they are developing a complete transition to sustainability or providing customers with product options. Increasing zoning issues, waste regulations, pressure from customers and national trends are all merging to compel growers to begin some higher level "green initiative". To tackle those increasingly complicated issues, Summit Plastic Company began in 2004 to research and develop alternatives to petroleum-based packaging for the horticulture industry.

A Broad-Strokes Approach

The commitment to "sustainable packaging" and bringing it to market takes the dedication of the company and management, technical expertise, research and development efforts across a wide range of stakeholders, enthusiastic people, time and money.

Initially, rather than following one path, Summit took a broad-stroke approach in researching alternative materials and after-market waste collection systems, while still engaging in the use of "good" plastic and improving manufacturing efficiencies.

Recycling "again" is an excellent way to get post-grower and post-retail containers back into the regrind stream. Collecting, transporting and sorting noncompatible resins, removing any labels or metals (e.g., staples and hog rings), and cleaning (washing/drying) are issues being dealt with in varying degrees on a regional basis. Recycling is one side of the issue.

For years, Summit Plastic produced lightweight thermoformed trays, inserts, pots and carriers from recycled postindustrial and post-consumer scraps that otherwise would have been discarded into landfills ➧

Material Things

Imported rice hulls. A renewable resource, rice hulls are composed primarily of waste from sustainable rice-hull fibers, containing no heavy metal or petroleum-based products. While degradable, the length of degradation varies by container type. Decomposing, overall, is best in industrial-compostable (high-heat) facilities. With just a few notable exceptions, growers found rice hull pots do not move with ease through automation systems. Round and square net pots with slotted sidewalls biodegrade faster and allow for easy plantability; root spreading is accomplished through slots in containers. The slotted rice hull containers go in the ground and stay in the ground — plantable pots.

Polylactic acid (PLA). This is a corn-based, high-heat, 100 percent non–fossil fuel, 100 percent renewable bioresin great for trays, square pots and custom packaging. The thermoplastic, which works well within the confines of automation, is derived from resources such as corn starch and sugar canes. The degrading characteristics of PLA, at this time, make industrial composting the best choice. Strong, durable and lightweight characteristics of PLA make this environmentally friendly source material perfect for single piece products, filling trays, handlers and Nu-Trays.

OP47. This biopolymer is made from 100 percent renewable, starch-based resources and is biodegradable and compostable in accordance with EN13432 and NFU 52001 environmental standards of the European Union. National testing for OP47 is ongoing for Ball's internationally patented and licensed OP47 Bio material. The chemical makeup of OP47 Bio allows fast, consistent conversion and thin-wall attributes perfect for labeling and colored printing.

Green container options for seamless integration into the industry are here and will only improve with increased engineering technologies, research and development of bio-options and more acceptance from the growing side of the industry.

— affordable, efficient and environmentally friendly packaging from traditional good plastic, packaging designed for specific growing applications, specific equipment, specific customers and specific parts of the country.

"Specific needs" takes on a different definition when considering the equipment investment on the part of both the manufacturer and the grower.

A Lofty Goal

Once the broad-stroke commitment was made and initial research started, a variety of products and possible raw-material choices presented themselves from national and international sources. But bio-friendly materials such as coconut, peat, rock wool, biodegradable wood fibers, bamboo pulp, composted cow manure, recycled paper and rice hulls all share a negative common denominator: They are difficult to produce and use without significant process changes for either the manufacturer, the grower or both.

Summit set out to find a material that looked, processed and handled like plastic but required little to no change in automation and manufacturing equipment for the grower and for Summit. Sound simple? Sure.

We encountered plenty of issues, such as the environment of a greenhouse or field, initial degradation from the application of chemicals, resistance to sun and heat, compatibility with greenhouse automation, and a full life span long enough to complete the growing, shipping and sales cycle.

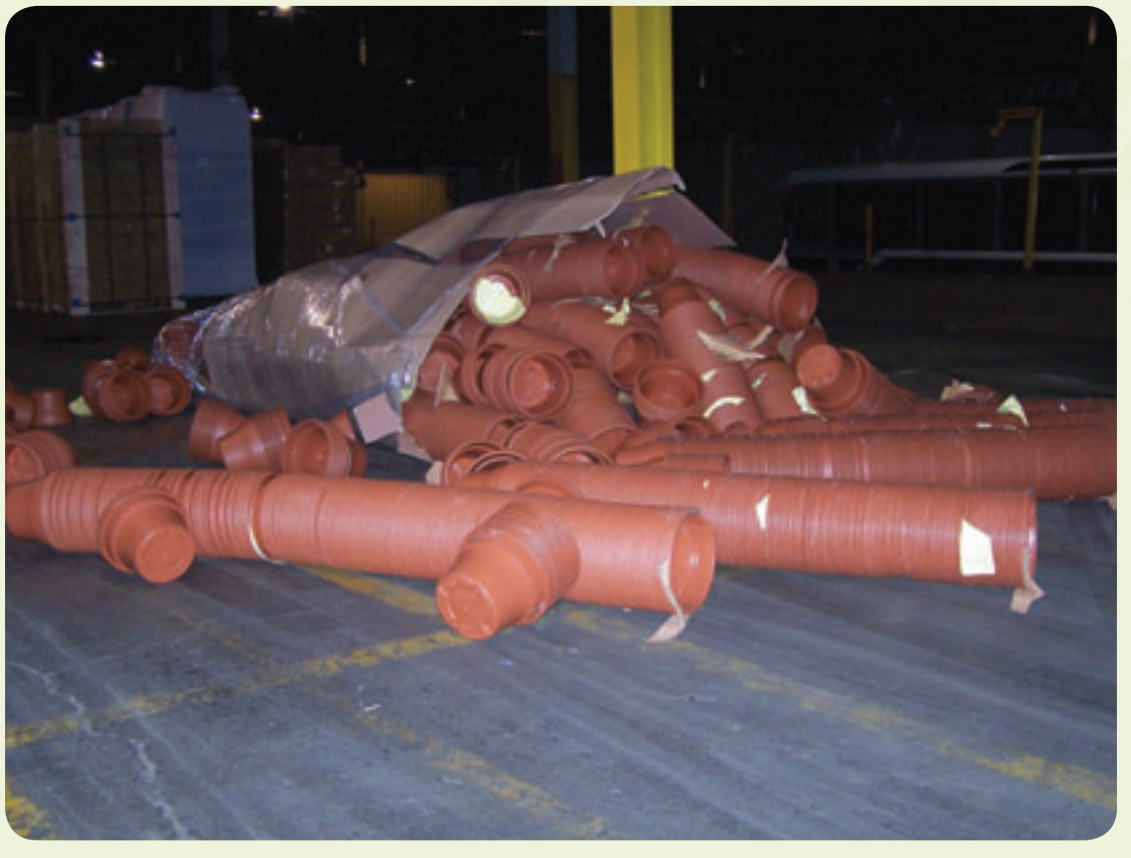
Polylactic acid (PLA) became commercial, from then Cargill/Dow, in 2003 with applications for food packaging, bottles, disposable serviceware, labels, specialty cards and consumer-goods packaging. Summit's initial inquiries in late 2004 led to identifying and testing this potential alternative to petroleum-based resins in March 2005.

Testing first consisted of blending PLA with various stabilizing additives. The results were less than desirable; among other things, PLA smelled like burnt popcorn! It became clear, from additional tests, the conversion specifications required to extrude and thermoform acceptable material required a reworking of the PLA blend, including adding heat stabilizers to meet the need of growers for shipping containers, indoor and outdoor storage and the greenhouse.

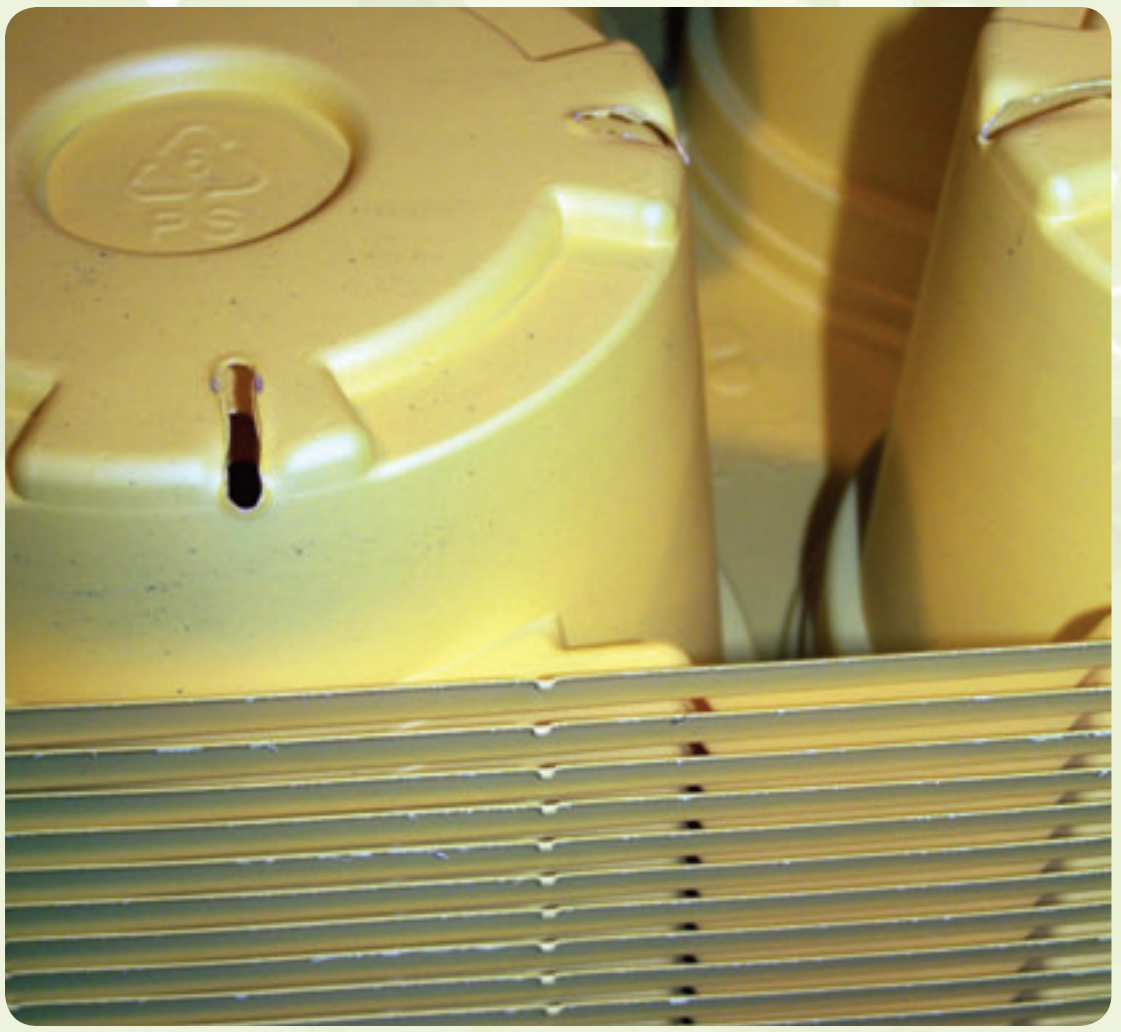
Tough Questions

Throughout 2004, blend and heat testing raised new questions surrounding shrinkage, cutting methods for serrations and scrap recovery. Introduced as a prototype program during the 2005 OFA Short Course, attendees were interested but resisted its pricing and application. Surprisingly, the biggest criticism of the bio-product was that it did not look like an earth-friendly product — it looked too much like plastic!

Research continued though 2005, and early in 2006, Summit Plastic Company and Ball Horticulture entered into an exclusive agreement for the sales and marketing ➧



Manufacturers are continuously looking for new and/or improved eco-friendly materials to produce sustainable products.



Eco-friendly products like these appeal to customers who understand and appreciate sustainability efforts — and grasp the need to pay a fair price for them.

of imported, degradable containers and the research, testing and manufacture of bioresin-based products.

The Ball proprietary product, OP47, a bioresin from Europe, went through significant testing in Europe thanks to Summit's overseas sister company, Desch-Plantpak. The anonymity possible with testing outside the United States, conducted by a strong team of engineers, provided increased confidentiality.

As Summit and Ball continued on the OP47 product testing program, sales of degradable rice hull pots began in late 2006 with considerable success. Initially viewed as simply an entry point into the sustainable market, then a stop-gap until the roll-out of OP47, it became clear by the end of the first year that rice hulls should stay in the sustainable product mix. Summit launched a companion product to rice hulls: filling trays and handlers from PLA raw materials, a truly renewable, environmentally friendly horticulture package, rice and corn.

Summit's Response

In the summer of 2008, Summit Plastic introduced Eco360, multiple product offerings that are 100 percent non–fossil fuel and 100 percent renewable.

Eco360 products are geared for the grower in terms of ease of handling, automation friendly, durability and excellent retail presentation. This results in economy and efficiency, complementing growers' need for high-velocity production and shipping during a short selling season. The same products appeal to consumers who understand and appreciate sustainability efforts. They also grasp the need to pay a fair price for the value-added features of biopackaging.

A Promising Future

The bio process is an evolution. Today, there are three viable choices, and tomorrow's expectations are for even better and more affordable alternatives as the industry moves to better uses of biomasses: all the corn's waste, stalk and leaves — not just the kernel — switch grasses, sugar cane and other non-food applications.

As the American market pushes for more earth-friendly products and the economy becomes stable, it will be possible to achieve a line of more affordable products with fully sustainable properties to satisfy not only the grower but the changing expectations of the consumer. GPN

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