

Plastics News

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Plastic film saves resources, boosts agriculture

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SWRT Solutions Inc.

MSU professor Alvin Smucker says SWRT allows farmers to use less fertilizer and pesticides, which saves money and protects potable groundwater.

The engineered PE film has "implications [that] are mind-bending and game-changing," with an ability to create good agricultural yields even from sandy soil.

Researchers at Michigan State University are using an engineered polyethylene film in an

agricultural application that has potential to make billions of acres of poor soil around the world into productive farmland.

"This is an innovative conservation technique that converts low-production sandy soil into sustainable agriculture," Alvin Smucker, a professor in university's department of plant, soil and microbial sciences, said in a telephone interview.

This isn't like a typical agricultural film. The subsurface water retention technology (SWRT) process uses monolayer PE film in a durable application, strategically placed at various depths below a plant's root zone to retain soil water. After it is installed, the film should be able to perform its function for years, just like plastic pipe.

East Lansing, Mich.-based MSU has been testing the product for five years and unveiled it to the world in August 2019. The university worked with Brentwood, Mo.-based film extruder Brentwood Plastics Inc. to develop the film.

"The implications are mind-bending and game-changing. SWRT increases yields in extant fields, renders sandy soils arable and allows land historically dependent on aquifers to remain in production," Joel Longstreth, marketing manager of Brentwood, said in a phone interview.

"Personally, I am excited about a positive story about plastics and to have SWRT as part of my legacy," Longstreth said.

Smucker said SWRT can convert at least 5 billion acres of sandy soils across the earth's surface into highly productive food and sustainable biomass production systems.

Studies show the film significantly boosts agricultural production. Above-ground plant growth improves exceptionally compared with soil without SWRT, in many cases ranging from 140-280 percent. But in some cases, it can be even more significant: Smucker cited a fourteenfold increase in production for one crop.

Using less supplemental irrigation is a big selling point for farmers, especially in places where water is scarce or expensive. Smucker said SWRT also allows farmers to use less fertilizer and pesticides, which saves money and protects potable groundwater.

In addition to the film, MSU developed SWRT farm implements capable of installing the membranes in four to six acres of farmland per day, at costs ranging from \$1,600 to

\$2,000 per acre, depending on soil depth and membrane thickness.

Longstreth said Brentwood started working with MSU in 2011. The challenge was coming up with a film that stands up to the stress of installation without developing holes or breaking.

"We responded to his requests and were generous with test material," which were needed to test the installation implement, Longstreth said. "Many people have donated their time on a volunteer basis because they believe in it."

Longstreth expects the service life of the film, once installed, to be similar to geotextiles and drainage pipe, which would be measured in decades, if not longer.

Brentwood made the film on existing blown film equipment, and "we can keep up with demand because the installations will be planned well in advance," Longstreth said.

Smucker was careful to call the film a "polymer" product instead of plastic, in part because the public may have a negative reaction to the idea of putting plastic film underground. Asked about that distinction, Longstreth made a vigorous defense for plastics in this application.

"Anyone who strenuously objects needs to show their plan for extrication of all underground plastic, if it's that evil. Take it all out — drainage tile, irrigation tubing, CPVC water pipe, PVC sewer pipe, CIPP [cured-in-place] pipe replacement, gas pipe, underground pipe marking, geotextiles, landfill liners — just to start," he said.

"My only concern about potential derailers is knockoffs. Failures of 'not exactly' devices could ruin the reputation overnight," Longstreth said. "Extruders will be tempted to cheap it out with off-grade and repro [resin]."

For farmers, the return on investment depends on the crop and other variables. But "one thing is for sure: Where they put this in the ground, the value of the land has gone up," Longstreth said.

As SWRT finally becomes commercial, Brentwood Plastics is going through a transformation. The company ceased production at its St. Louis-area plant in early December, after the city acquired the plant by eminent domain for an economic development project.

The company is still in business, but it has become a virtual manufacturer. It relocated its blown film lines to other companies that will continue to make film to Brentwood Plastics' specifications, Longstreth said.

The plant closing marked a milestone for the Longstreth family. His father, Joe, launched the company in 1961. Joel and his brother Sam, who is now president, started in the family business when they were still kids.

"At the ripe old age of 11," Longstreth joked. But he emphasized that if SWRT takes off, Brentwood can meet the demand.

"If these extruders have capacity restraints, we can partner with other blown film extruders to make the film to our specifications," he said.

Inline Play

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