

Use of switchgrass growing in popularity for ag conservation

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Will switchgrass, a tall, resilient and fast-growing native plant once familiar to pioneers, become the next cash crop for farmers in states in the Chesapeake Bay drainage?

In a convergence of promising developments, a new study gives switchgrass lofty environmental grades and assures skeptics that it would not, like corn-based ethanol, be another biofuel that replaces a food crop with questionable environmental benefits.



The long roots of switchgrass suck up excess nitrogen while the plants grow. There are evolving markets for using harvested switchgrass in erosion-control silt socks and poultry bedding.

Also, states in the Bay watershed are calling for dramatic increases in soil- and nutrient-filtering streamside buffers in an effort to meet Bay restoration goals by 2025. Pennsylvania, for example, has a goal of planting an additional 100,000 acres of grass buffers.

A third factor may provide yet another boost for switchgrass. A new trend, called multi-functional or “productive” buffers, allows farmers to plant profitable vegetation like switchgrass in streamside buffers. And switchgrass has been found to be good habitat for wildlife and bee pollinators, which are in decline.

A workshop led by the state-federal Chesapeake Bay Program highlighted multifunctional buffers with warm-season grasses such as switchgrass as the best hope for planting buffers on a scale large enough to meet Bay restoration goals.

Moreover, markets for switchgrass are evolving, putting it to use in erosion-control silt socks and poultry bedding. That gives farmers economic incentives to grow it in buffers, set-aside land programs and wet or low-performing parts of fields.

“There are major Earth-shattering movements in the environmental spaces right now. Switchgrass is one of them,” said Mike Zock of MKB Company, a Pennsylvania-based startup that in just two years has become the biggest seller of switchgrass silt socks in the eastern United States. The company is buying 10,000 tons of switchgrass a year grown on farms in Pennsylvania, Maryland, Virginia and several other states, as well as Canada.

Environmental agencies in Pennsylvania, West Virginia and Ohio have approved the products for pipeline projects, road construction and other uses.



Silt sock filled with switchgrass are used at construction sites to control erosion. (MKB Company)

With alternatives to fossil fuels ever more important to combat climate change, switchgrass has been proposed as a next-generation carbon-negative biofuel. But environmentalists have fretted that it might carry environmental baggage, like displacing carbon-capturing forests or food production or, like corn, cause runoff pollution and need vast amounts of fertilizers and pesticides.

But in a government-supported study published in the August journal of the National Academy of National Sciences, scientists from several universities reported what they call the first “soil to tailpipe emissions” study of switchgrass’ balance sheet.

Researchers found that switchgrass, if used in streamside buffers or as a cash crop, stores harmful carbon at a level similar to trees and better than land planted with other native grasses. If switchgrass takes off as a biofuel, it could be processed in refineries where carbon could be captured and stored, making it even more viable as a significant fuel source.

They also found that switchgrass, even grown as a monoculture, has much more biodiversity than corn and supports more insects, birds and pollinators, partly because it isn't cut and replanted every year. Soil health practices were augmented by switchgrass, and crop pests were fewer.

"There is evidence that switchgrass could enhance biodiversity on current landscapes," said Tom Richard, a Penn State professor of agriculture and biological engineering who worked on the study.

"I like to think of our study as a call to action," said Erica Smithwick, a Penn State professor of geology who was one of the researchers. "This can make a huge difference if people invest in it. I think the family of advanced biofuels is a potential solution to the climate crisis."



Switchgrass can serve as bedding in poultry houses. (Association of Warm Season Grass Producers)

But, so far, the move to make switchgrass the main source of a new biofuel nationwide is in its infancy, hindered by cheap gas prices, scant buy-in from policymakers and hesitant support from mainstream environmental groups. "Right now, there are not sufficient subsidies to promote biofuel goals," Richard said.

One exception is in southeastern Virginia, where the Piedmont Geriatric Hospital is entirely heated and cooled by the burning of switchgrass. To support the hospital's boiler, 13 farmers in seven Virginia counties are growing switchgrass on 3,300 acres of marginal soil or government land set-aside programs. Surplus switchgrass is sold for silt socks, cattle feed and other byproducts.

"Our business is the conservation industry," said Fred Circle, CEO of Ohio-based FDC Enterprises, which built and runs the project. "The idea is to be able to do something on a local basis, help farms with underperforming land and solve erosion and invasive species problems."

“If we can turn that land into switchgrass, all these things go away. And we are improving wildlife habitat. That’s the trick, how do you monetize soil health? There’s got to be a profit motive or it’s never going to get any traction.”

Circle said the company is “very close” to signing contracts for two more similar switchgrass-to-fuel projects in the Bay watershed.

While silk socks and poultry bedding are the two most salient success stories, switchgrass advocates see these possible markets developing: cat litter; bale building blocks for homes; fuel pellets; cover for wild game; feed for cattle; abandoned mine reclamation; medium for growing mushrooms; ornamentals; plantings under solar panels; and burning methane in anaerobic digesters to produce electricity on a farm scale.

Will Brandau, a Pennsylvania farmer, formed the Association of Warm Season Grass Producers four years ago with the idea of selling switchgrass for silt socks.

Another idea was to use switchgrass as poultry bedding for both backyard chicken coops and large poultry operations. It worked. The group has 25 switchgrass producers from all over the East Coast and has gotten grants from groups such as Sustainable Agriculture Research and Education. A prototype machine has just been finished that poultry farmers can share to grind up switchgrass for bedding right on the farm.

A focus of research is to prove that there is vast underperforming farmland right now – not just along streams – that could provide the farmer more income while reducing nutrient pollution.

In fact, using satellite imagery, Penn State researchers estimated that there are more than 500,000 acres of farmland in Pennsylvania that are currently idle or in traditional crops that are not growing well because they are in wet or flood-prone areas. When one adds in existing buffers that could be expanded for switchgrass, or set-aside programs like CREP, the total rises to 800,000 acres.

That’s a potential for 6 million tons of harvestable switchgrass worth perhaps \$590 million annually, according to Stephanie Herbstritt of Pennsylvania’s College of Agricultural Sciences and Biological Engineering.

Dan Arnett of Ernst Conservation Seeds, a Pennsylvania company that is one of the largest switchgrass seed producers in the country, agreed that giving landowners a profitable incentive to improve their land environmentally could be a game changer.

“This is a huge win for everyone, makes a lot of sense and could really take things to scale while helping the Bay in a significant way.”

https://www.bayjournal.com/news/pollution/use-of-switchgrass-growing-in-popularity-for-ag-conservation/article_85e96b90-0efd-11eb-8145-a790aafd9a56.html