Smith has been farming kelp on the same 20 acres for nearly 20 years with no need to fertilize or pay for any other inputs.

Sea Farming Catching On

Bren Smith saves seed and produces seedlings that he carefully plants and later harvests. Unlike most farmers, his fields are 20 acres off the coast of Connecticut. His polyculture system produces around 250,000 lbs. of kelp each winter, mussels in the spring, summer and fall, and oysters year-round.

"I grow seaweed alongside scallops in lantern nets and mussels in mesh socks all hanging from underwater rope scaffolding just below the surface of the ocean," says Smith. "Staked below the seaweed are oysters in cages and clams buried in the sea floor. If one crop fails, I have others to fall back on."

He notes that one of the best things about kelp farming is the availability and low cost of land. Smith explains that the local community controls nearshore ocean farming. As you go farther offshore, the state and eventually the federal government control it.

He pays the local community government $50 per acre for his 20-acre lease. The public has full access to the area except for harvesting the seaweed and shellfish.

"Some of the best fishing in the area is on my farm," says Smith.

Smith's farm season starts in the fall when kelp seed production kicks off in the nursery.

"We have spools of string in the nursery, and the kelp grows on it," says Smith. "When it reaches about a centimeter, the seed strings are brought to the farm and unraveled around long ropes anchored in the ocean. It then grows vertically downward. Depending on the location, the farm can be from 6 ft. to 100 ft. deep."

The deeper the water, the longer the ropes and the bigger the anchors, notes Smith. Unlike planting on land, the water is constantly being renewed. He's been farming kelp on the same 20 acres for 19 years with no need to fertilize or pay for any other inputs. Smith estimates that anyone with $30,000, a boat and 20 ocean acres could start a farm.

Helping others farm the ocean is why he founded GreenWave, a North American nonprofit dedicated to training and supporting others to farm as he does. What started as an effort to share his ideas with a few friends became a tsunami when it went viral.

"I was training 8 to 10 people a year through GreenWave,' says Smith. "When I set up a website to offer the training, we had 8,000 people from the U.S. and more than 100 countries sign up."

Thanks to grants and donations from major companies, foundations, government agencies and member organizations, GreenWave has become an educational hub. By leveraging a mix of farmer-forward training and support, as well as infrastructure and market development, GreenWave partners with coastal communities to replicate and scale the regenerative ocean farming model.

GreenWave also operates a seed bank and nursery, growing the majority of kelp seed for farmers in southern New England. The organization's farm and nursery serve as both a commercial farm and an innovation hub, where new designs and technologies are tested.

"Our online community now numbers more than 8,000 people, from early-stage and advanced farmers to scientists and seed producers to other seaweed organizations and entrepreneurs, sharing information and learning together," says Smith.

The free online training includes 30 courses, featuring over 100 videos and more than 110 lessons on launching and scaling an ocean farm business.

GreenWave also offers several resources for experienced seaweed farmers. Seaweed Source is a free app, helping seed producers, farmers and buyers discover new partners in the industry and initiate forward contracts. The Kelp Climate Fund pays seaweed farmers for the environmental benefits their farms provide. Farmer Forum is a series of virtual and in-person gatherings around seasonally relevant topics.

To date, over 8,000 users are tapped into the free Regenerative Ocean Farming Hub training, tools and community. The Kelp Climate Fund supports 77 farms across 11 states and provinces in the U.S. and Canada. They've planted over 300 miles of kelp seed string and harvested 3.1 million lbs. of kelp. Ninety-eight companies from 19 states have signed up on Seaweed Source.

Until recently, U.S. and Canadian seaweed farmers struggled to compete with low-cost producers in Asia. But Smith believes that's changing.

"As wages rise and outdated systems fall behind, there's an opening for North American farmers to lead with regenerative, modern methods," he says.

Contact: FARM SHOW Followup, GreenWave (www.greenwave.org).

"We're steering the vehicle off the line the user has created to keep the implement lined up properly," Handsaker says.

Implement Steering Solution Improves Field Accuracy

Autosteer solutions have brought a level of accuracy to seed and fertilizer placement, but trailed implements still drift off the desired guidance line due to factors such as terrain, soil conditions, tractor speed, and implement length and width. Ag Leader, a precision farming company, developed RightPath to address these shortfalls.

When pass-to-pass accuracy isn't optimal during seeding, plants overlap unnecessarily, or large gaps are left, lowering crop yields and promoting weed growth.

Ag Leader believes steering the tractor properly is only part of the accuracy story and is currently adding implement steering to help complete the process.

Towed implements drift off the desired line as they're only controlled by the tractor's forward momentum. Even on flat ground, implements can drift up to 10 in. Sidehills, bends and curves increase these numbers.

"Many growers are moving toward more accurate GPS solutions, specifically with planters," says Ag Leader Product Sales Specialist Logan Handsaker. "RightPath is our next phase in steering solutions geared towards solving problems not addressed by just keeping the tractor on the line."

The RightPath system features a GPS receiver mounted on the implement, working in tandem with the tractor, to direct the implement onto the desired path.

The technology enables farmers to plant seeds accurately relative to previous strip-till or NH3 applications, achieve consistent guess rows in all conditions, plus reuse the same guidance lines during subsequent field activities.

"Essentially, we're steering the vehicle off the line the user has created to keep the implement lined up properly," Handsaker says. "We're driving to the left and right, overcorrecting at times to keep the towed equipment on the correct line."

To use RightPath, both the vehicle and implement require Ag Leader's GPS 7500; however, only the vehicle requires TerraStar-C, TerraStar-X, or RTK. This allows operators to select the most suitable GPS correction for their specific needs. RightPath works with Ag Leader's InCommand Go displays throughout the year and is compatible with SteerCommand Z2 and SteadySteer.

"With passive implement steering, we're always reacting to the terrain and then making corrections. It's challenging, but we've completed extensive testing and field time to confirm solid results. Currently, we're accurate in achieving plus or minus 3 to 4 in. away from the guidance line."

RightPath equipment is manufactured in Ames, Iowa, and will be available to farmers in late fall of 2025.

The GPS 7500 receiver retails for $2,295 with an unlock fee of $2,495. Approximately $750 of miscellaneous components, brackets, and cables is required. No recurring subscription fees are necessary.

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Groups Work To Integrate Livestock And Crops

Mixing livestock and crops really is a good idea, according to farmers, researchers and representatives of more than 50 ag and conservation organizations. They were all part of Match Made In Heaven: Livestock + Crops. The project involved developing case studies, holding field days, creating graphic tools and resources and conducting a survey of crop and livestock farmers. All of it is detailed on the Match Made in Heaven website.

"This was a three-year project of Green Lands Blue Waters," says Jane Grimsbo Jewett, associate director, Minnesota Institute for Sustainable Agriculture. "Our goal was to give educators more tools to focus on when educating farmers to alternative practices and the barriers to adopting them."

Green Lands Blue Waters (GLBW) is a network of groups working to get Continuous Living Cover (CLC) on the land. This includes the expanded use of cover crops, as well as increased use of perennials, partly through the development of new crops. Like Match Made in Heaven, it includes a wide variety of ag and conservation organizations. GLBW was established in 2004 to undertake a range of initiatives aimed at demonstrating the benefits of CLC farming and promoting its adoption.

The three-year, multi-state Match Made in Heaven project provided opportunities for participants to discuss the integration of crops and livestock. They examined how integrating grain and livestock benefits soil health, soil conservation and farmers' bottom lines.

"Farmer case studies provide a deeper dive into what farmers are doing," says Jewett. "The graphics are for use as conversation starters when asking farmers where they're at."

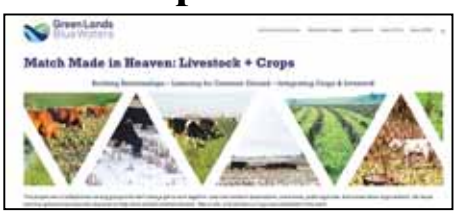
The group also created a partial budgeting tool based on the case studies.

"It doesn't provide the details of some farm management information, but it provides a quick and dirty of what farmers should have top of mind if considering adding livestock to their farm. It provides calculations of what it costs, along with a range of numbers to plug in."

Perhaps most helpful to farmers considering making the switch is the Library of Resources. It includes a list of news articles and technical publications on the subject.

A key element in the project was a survey of farmers throughout the Midwest to understand what works and what doesn't. The website features summary fact sheets that include charts and data tables.

"We had 566 useable responses from 20 states," says Jewett. "The majority of respondents had both crops and livestock. Questions were about practices, including grazing and soil health. The survey also asked about attitudes toward livestock and crop integration."



Match Made in Heaven project provided opportunities for participants to discuss the integration of crops and livestock.

The significant challenges that crop farmers faced in adding livestock were mainly operational. They included the cost and maintenance of fencing, water systems and housing.

"Both crop and integrated crop and livestock participants saw funding as a major challenge," says Jewett. "They noted that the subsidy structure for crops is really robust, but not so much for livestock and even less for grazing and soil health practices."

Jewett encourages farmers and others to visit the website and review the information presented there.

"There are a ton of summary fact sheets under the survey section," she says. "They cover a lot of information."

Contact: FARM SHOW Followup, Match Made in Heaven: Livestock + Crops (jewet006@umn.edu; https://greenlandsbluewaters.org/match-made-in-heaven-livestock-crops).