

A photograph of Millard and Connie Locklear standing in a high tunnel. Millard is on the left, wearing a bright pink long-sleeved shirt and khaki pants. Connie is on the right, wearing a floral patterned sleeveless top and khaki pants, and a white sun hat. They are both smiling and looking at each other. The high tunnel is made of a metal frame covered in clear plastic, with rows of plants visible on the ground.

Millard and Connie Locklear, New Ground Farm

Growing fresh produce for students in North Carolina's eastern coastal plain

INTRODUCTION TO THE FARM

Millard and Connie Locklear are owners and farmers at New Ground Farm in Pembroke, North Carolina. The farm is located on loamy sand soils in North Carolina's coastal plain. The 26-acre farm has been in Millard's family since the 1930s, and four generations of Locklears have lived on the farm. Millard was born and raised on the farm and began farming it again at full capacity in 2015 after a career away from the farm.

Millard and Connie grow a wide array of vegetables, including peas, sweet corn, kale, collard greens, tomatoes, squash, peppers and eggplant. New Ground Farm is certified by the U.S. Department of Agriculture's Harmonized Good Agricultural Practices program,¹ and Millard and Connie sell many of their crops directly to the NC University of North Carolina system and UNC Pembroke in particular.

Millard and Connie are part of the Lumbee Tribe of North Carolina and integrate the values of their Lumbee heritage into the way they farm. They have also transitioned the farm into a nonprofit organization focused on educating the community about sustainable farming.

Farm objective

Millard and Connie's objectives are to operate the land sustainably, build soil health, and educate the community about the role of sustainable farming in supporting a robust local foods network.

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We hope for the future that our farm can grow more sustainable and be able to produce more and more fresh organic, and sustainable food.”

—Connie Locklear, New Ground Farm

Climate challenges and resilient practices

New Ground Farm faces increasing challenges from hurricanes and other severe storms affecting North Carolina's coastal plain.

The challenges caused Millard and Connie to focus on their soils' health. They implement reduced tillage and cover crops, which reduce soil compaction, increase water filtration during heavy rains, and increase water holding capacity for use during drier times of the year.

The Locklears have also used high tunnels since 2017, which allow them to control the growing environment, buffer moisture and temperature extremes, and extend the growing season for high-value crops. High tunnels also allow Connie to control the amount of water provided to the soil, which improves water efficiency and helps reduce pest damage. Overall, the high tunnels reduce the impact of increasingly severe rainfall and temperature extremes, while improving crop yield and quality.

About the Farm

Farmers: Millard and Connie Locklear

County: Robeson

Crops: Peas, sweet corn, kale, collards, tomatoes, squash, peppers and eggplants

Farm size: 26 acres

Climate-resilient practices: High tunnels, cover crops and reduced tillage

Financial outcomes:

- High tunnels increased farm income by \$9,365 per year.
- Cover crops increased net income from a half-acre field by \$27.

¹ Learn more about Harmonized GAP certification here: ams.usda.gov/services/auditing/gap-ghp/harmonized.

ECONOMIC IMPACTS OF CLIMATE-RESILIENT PRACTICES

New Ground Farm's climate-resilient high tunnel and cover crop practices generated positive financial impacts on the farm.

Table one below presents the financial benefits and costs associated with growing tomatoes in a high tunnel. Overall, growing tomatoes in high tunnels increased net income by \$9,365 per year by increasing the duration of the growing season and the percentage of high-quality yields. Increasing the picking season from five weeks to seven and a half months increased tomato revenues by \$4,641 per year. The high tunnels also increased the percentage of tomatoes of high enough quality to be sold from 60% to almost 100%, increasing annual revenue by \$3,654. Using high tunnels decreased Connie's labor hours for tomatoes from 16 to 4

hours per week, resulting in a cost savings of \$1,697 per year.

The high tunnels also came with important expenses, including the \$3,000 up-front investment in the high tunnel and the \$500 plastic cover. The Locklears purchased the high tunnels and did not use cost-share or loan financing. Assuming a 20-year lifespan of the high tunnel and a five-year lifespan for the plastic cover, the annual depreciation costs were \$180 for the tunnel and \$160 for the plastic cover. Using high tunnels also included \$222 per year in costs for trellising materials used to support the tomato vines' vertical growth. Millard and Connie also spent time learning how to effectively grow crops in high tunnels, which cost them \$64.29 in labor costs.

Table one: Financial impacts of high tunnels

Increase in net income				Decrease in net income			
Increase in revenue				Decrease in revenue			
Item	Per sq. ft.	Sq. ft.	Total	Item	Per sq. ft.	Sq. ft.	Total
Increased duration of picking	\$2	2,178	\$4,641	None identified	\$0	0	\$0
Increased sellable yield	\$1.68	2,178	\$3,654				
Total increase in revenue	\$4	2,178	\$8,295	Total decrease in revenue	\$0	0	\$0
Decrease in cost				Increase in cost			
Item	Per sq. ft.	Sq. ft.	Total	Item	Per sq. ft.	Sq. ft.	Total
Labor			\$1,697	High tunnel depreciation	\$0.08	2,178	\$180
				Plastic cover depreciation	\$0.07	2,178	\$160
				Trellising materials	\$0.10	2,178	\$222
				Learning activities	\$0.03	2,178	\$64.29
Total decrease in cost	\$0		\$1,697	Total increase in cost	\$0.29		\$626.29
Total increase in net income	\$4		\$9,992	Total decrease in net income	\$0.29		\$626.29
Increase in net income \$9,365							

Table two demonstrates the costs and cost savings associated with growing a cover crop prior to sweet corn and snap peas in a half-acre field. The Locklears were able to invest in soil health by planting cover crops without a significant impact on the farm's finances. The half-acre of cover crop increased net income on the farm by \$27 per year. Millard planted 32.5 pounds of a cool season, soil builder cover crop mix that included spring peas, common vetch, crimson clover, spring oats, daikon radishes and seven other species. The cover crop seed cost him \$22.50 for the half acre. The additional tractor cost for planting the cover crop was \$3, and renting the seeder cost \$4 for the half-acre field.

These added costs were offset with cost savings from fertilizer and weed suppression. Millard reduced fertilizer costs from \$150 to \$75 for the half acre due to the nutrient benefits of the cover crop mix. He was able to reduce fertilizer costs by testing different application rates in fields where cover crops were grown. The cover crop has also reduced weed pressure, which allowed Millard to forgo four bushhog trips across the field, saving \$18.75 in fuel and labor.

Table two: Financial impacts of cover crops

Increase in net income				Decrease in net income			
Increase in revenue				Decrease in revenue			
Item	Per acre.	Acre	Total	Item	Per acre.	Acre	Total
None identified	\$0	0	\$0	None identified	\$0	0	\$0
Total increase in revenue	\$0	0	\$0	Total decrease in revenue	\$0	0	\$0
Decrease in cost				Increase in cost			
Item	Per acre.	Acre	Total	Item	Per acre.	Acre	Total
Fertilizer	\$75	0.5	\$38	Cover crop seed	\$45	0.5	\$22.50
Weed suppression	\$4.69	4	\$18.75	Tractor cost	\$5	0.5	\$03
				Machinery rental	\$8	0.5	\$4
Total decrease in cost	\$80		\$56	Total increase in cost	\$58		\$29
Total increase in net income	\$80		\$56	Total decrease in net income	\$0.29		\$29
Increase in net income \$27							

CONCLUSION

Millard and Connie are building their farm's resilience against increasingly frequent severe storms by increasing their soils' filtration capacity using cover crops and controlling the temperature and moisture conditions of their high-value tomato crop. Millard and Connie have been able to increase their farm's profitability using cover crops and high tunnels by evaluating different cover crop techniques and increasing the length of the tomato growing season.

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What we've seen with the diversity of cover crops is that each plant gives a certain thing. The amount of money that it has saved in the last three years, as you can see in these fields, is the amount of weed suppression.”

— Millard Locklear, New Ground Farm



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