Transfarmation®

Growing Change for the Future

GRANT REPORT

Reporting Period: December 2022–December 2023

Amount Granted: $10,000

Farm Location: Oxford, North Carolina

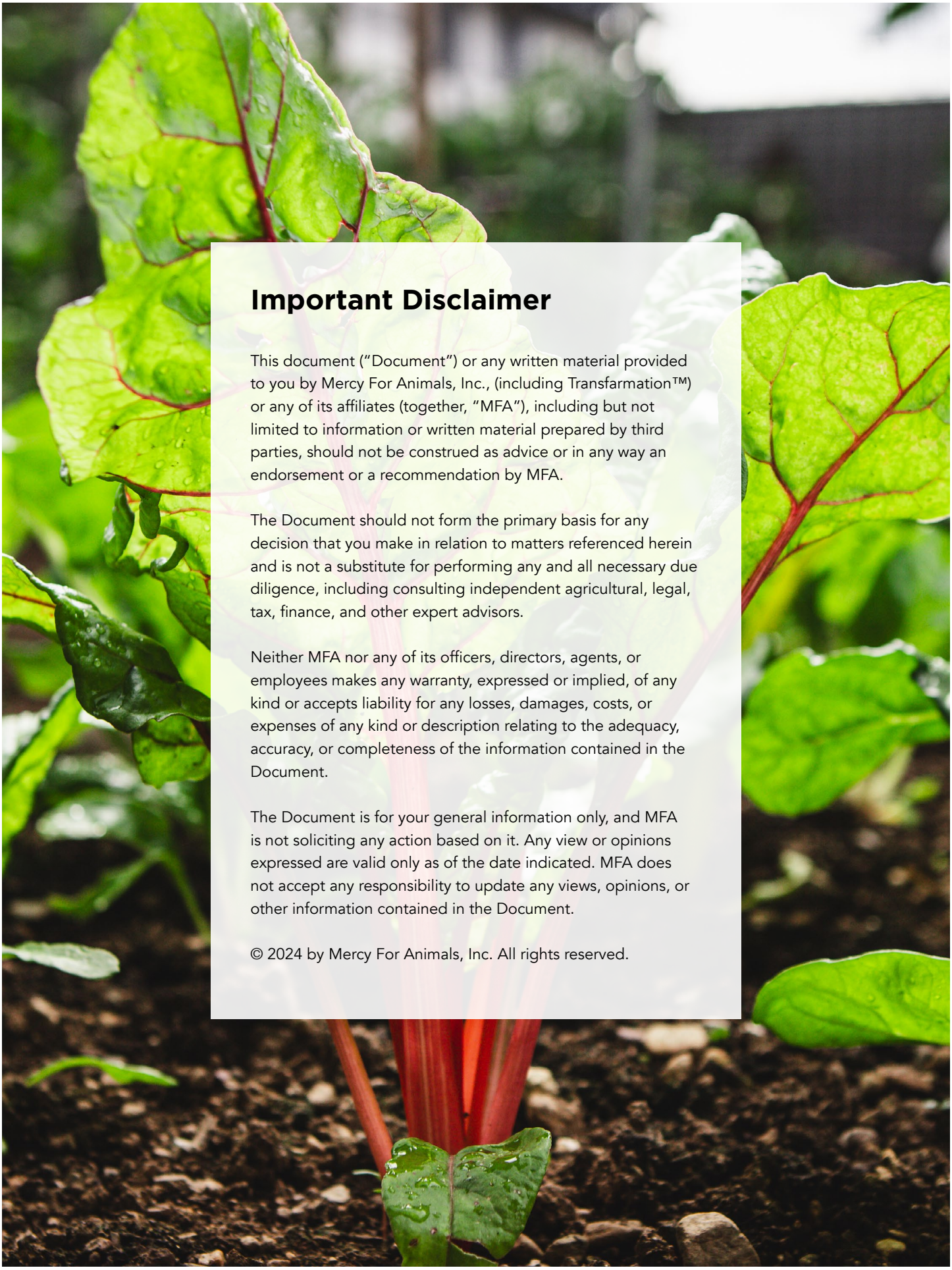
Former Farm Type: Dairy

Farming Method Tested: Specialty-crop production inside former milking parlor

Recommended for Other Farmers? Yes

Biggest Learning: Farm diversification can add resilience and flexibility to an operation, particularly if a farmer faces hurdles during construction or refinement of a new system for a specific crop.

A Bo Halley Research and Innovation Grant totaling $10,000 was awarded to Phillip and Dorathy Barker for their Growing Change for the Future project. The Barkers own **Olusanya Farms**, a Black-owned farm committed to growing healthy food for their community and employing local workers. The Barkers transitioned their dairy farm to vegetable production before engaging with Transfarmation™ but outlined plans to make their operation more sustainable through season-extension infrastructure. This project provides an example to other farmers about the long-term viability of vegetable production using animal-agriculture infrastructure.



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Dairy barn structural remnants

Stages of Transition

Phillip reported that they had multiple farm projects they were working on, including their Growing Change for the Future project. Their first three months were spent in the research and planning stage, which included preparing to split the space between growing in raised beds and hydroponics, determining sources for materials, securing construction help qualified to meet their specifications for a slanted roof made of hard plastic, and installing a tracking system. Phillip researched a few vendors for project supplies, ultimately choosing Growers Supply so they could purchase and receive everything in one shipment.

In their second quarter, Phillip ordered the materials for their project build-out, which took about a week to arrive. They started on the greenhouse but realized the structure needed more work than anticipated. They pivoted to constructing a roof to enclose a smaller portion of the building intended to become a mushroom-growing room. Construction of the 50' by 300' room took about three weeks. A test crop of oyster mushrooms was grown in the newly enclosed room, which took five days.

Mushroom-growing room with drains and environmental controls

Progress made in the third quarter included demolishing the old framing that was no longer viable and beginning construction on the new framing for the greenhouse section.

Greenhouse frame construction

In their last quarter, Phillip reported that the greenhouse was about 75% complete. The mushroom space was finished, with drains and environmental controls. They grew lion's mane and shiitake mushrooms. They are working on getting soil in their greenhouse and plan to start growing ginger once construction is finished.

Greenhouse about 75% enclosed

Inside the greenhouse

Table 1. Project stages and time required

Stage	Time
Research and planning	3 months
Ordering and shipping of project materials	1 week
Enclosure of a mushroom-growing room	3 weeks
Mushroom crop test	5 days
Removal of the old building structure for the greenhouse section	80+ hours
Construction of the new building structure for the greenhouse section	90+ hours
Construction to 75% completion	3 months

Project-Related Tasks

Day-to-day tasks in the first quarter included researching materials and thinking about marketing.

In the second quarter, daily tasks included conducting market research, experimental growing of oyster mushrooms, tackling carpentry and mechanical jobs for the greenhouse structure build, and securing someone for general carpentry. An important task of note was remediation of the damaged structure, including adding protective coating.

Weekly tasks in the third quarter included construction and researching markets for greenhouse crops. Monthly tasks included sourcing labor for the greenhouse construction and researching greenhouse layout and equipment.

Daily tasks in the fourth quarter included construction, research on selling ginger, and research on hydroponics.

Table 2. Labor hours required

Project quarter	Farmer labor hours	Hired labor hours
Q2	Unknown	Unknown
Q3	10–30 hours/week	10–70 hours/week
Q4	8 hours/week	140 hours/week

Sales

At the one-year mark of their project, the Barkers had not yet made project-related sales outside their existing farm operations.

Was the funding sufficient for the project?

The Barkers did not spend any funds in the first quarter. By the end of the second quarter, they had spent all their grant funds on their order from Growers Supply for $13,819.18 for project materials.

Table 3. Proposed and actual budgets

Proposed budget		Actual budget	
Polycarbonate structural sheet (PCSS) panels, 8 mm, 6' x 26' x6", 25 count	$9,950	Corrugated polycarbonate sheet 50" x 12'2", clear, 80 count, unit price $119.95	$9,596.00
PCSS splice and profiles	$2,782	1' neobonded galvanized washer, bag of 100, 50 count, unit price $6.45	$322.50
PCSS fasteners	$975	Tek screw #14 x 1" HWH, zinc, bag of 100, 50 count, unit price $10.15	$507.50
Ridge flashing 10', 15 count	$900	Horizontal closure strip for corrugated polycarbonate, 140 count, unit price $2.65	$371.00
		U-channel, aluminum, 1.25" W x 8' L, 20 count, unit price $10.27	$205.40
		5/8" x 1" foam (25' roll), 40 count, unit price $21.95	$878.00
		Shipping	$1,064.95
		Taxes	$873.83
		Subtotal	$13,819.18
		Structural remediation—materials and labor	~$13,000
Estimated total	**$14,607**	**Actual project total**	**~$26,000**

Table 4. Project timeline

2023		Projected timeline	Actual timeline
Q1	January	Receive funds	Received funds; researched and planned
	February	Order materials	Researched and planned
	March	Start construction	Researched and planned
Q2	April	Continue construction	Ordered materials (4/25/2023)
	May	Complete construction on converted roof	Received materials; attempted to begin construction on greenhouse roof; pivoted to enclosing mushroom-growing space first after discovering framing needed remediation
	June	Construct raised beds	Worked on frame construction and sourcing labor
Q3	July	Begin construction of hydroponic system	Worked on frame construction and sourcing labor
	August	Continue construction of hydroponic system	Worked on frame construction and sourcing labor
	September	Plant crops in raised beds	Worked on frame construction and sourcing labor
Q4	October	Start crops in hydroponic system	Worked on frame construction
	November	Grow crops in raised beds and hydroponic system	Worked on frame construction
	December	Continue growing crops in raised beds and hydroponic systems; make adjustments	Worked on frame construction; experimented with hydroponics and growing tower systems; experimented with growing mushrooms

Unexpected Challenges and Lessons Learned

Phillip reported that the biggest challenge in their first quarter was that they were engaged in legislative meetings with Operation Spring Plant and activities with HEAL Food Alliance, Transformation, and the NC Association of Black Farmers. He stated that they were passionate about positioning themselves to benefit their community through their transition project and policy work.

Reflecting on the second quarter, Phillip said the most difficult part of the project was figuring out crop longevity and sustainability and determining which crops to grow and sell in their area. He said that animal farming locks a person in, but growing specialty crops for human consumption offers flexibility and is more rewarding. He stated that raising animals for food doesn't nurture local and regional communities and degrades the environment. He prioritized supporting his community by growing healthy food. Phillip did not list any particular challenges in the second quarter, only that assembling a team that works with him and supports his vision was important. He emphasized the importance of sharing knowledge and activities with one's community and making them aware of options beyond traditional crops. He said they had a wide audience for their project and no pushback from their community. He mentioned that their network through Operation Spring Plant has been helpful.

Phillip noted unexpected delays and labor constraints as challenges in the third quarter. They didn't realize until they were ready to begin the greenhouse construction that the existing framing needed remediation before the project could move forward. Phillip didn't expect construction to take so long but reported no issues with the demolition. He acknowledged that their ongoing

farm operations pulled labor away from the project, preventing it from moving forward as quickly as they had hoped. He estimated needing at least two full-time workers dedicated to this project. Phillip advises other farmers to think through and estimate costs for the entire project after assessing the state of the structure they plan to transition. He recommends making sure to factor in materials, dedicated labor, and how long the farmer needs the structure to last.

In the fourth quarter, Phillip noted the importance of knowing what one is working with structurally and having a plan before starting a transition project. A year into their project, they had not yet grown anything in the greenhouse space, as the structure had not been completed. Phillip expects a learning curve when trialing different growing systems for mushrooms and that adding the greenhouse growing space will change the dynamics of their existing operations and require more labor. Regarding labor, he found that most people wanted full-time, consistent work, not part-time or inconsistent work. He added that active operations should not try to use their existing labor force to implement construction because it will likely delay completion. Phillip listed the financial aspect of the structural remediation as a challenge; they had not accounted for the materials and additional labor needed to address the issue. Phillip has experienced effects of climate change on outdoor production and has adapted by starting earlier in the spring and adjusting watering systems for the full summer season. He believes that infrastructure, like their greenhouse project, is becoming more and more important for farmers to stay in business. They're also working to implement cover-cropping systems to aid in carbon sequestration.

What would the farmer have done differently?

Phillip wishes he had started his farm transition before a hurricane destroyed their barn almost a decade ago. He would have assessed the state of the structure before planning the transition to ensure cost estimates were accurate and that they had the materials, dedicated labor, and time needed. Phillip would have liked to complete the transition faster. The Barkers thought they could use their existing farm labor, but they've had to pull them back to other areas of the farm. They've since hired outside labor for a dedicated construction crew.

Farmer Achievements

The Barkers believe the innovative nature of their project draws in the next generation and will get people involved. Phillip is proud of the additional connections they have made through Transfarmation's facilitation of Operation Spring Plant's policy efforts, highlighting the unfair and racist practices they've experienced as Black farmers. Phillip also expressed pride in their pilot project and learning how they can help their local community. He is glad that they decided to bring in an assistant and that they created the mushroom-growing room and grew a test crop. Phillip listed their continued ability to provide a livable wage for their employees and have a positive impact on their community as an achievement. He is proud that their farm has been able to offer consistent employment throughout the year. The Barkers are in the final stages of construction, adding their growing systems to the greenhouse area.

Greens growing in a hydroponic system

In-ground growing section in the greenhouse

December 2024 Update

One year after the project, the Barkers had several updates to share. They completed construction at the beginning of summer 2024, converting most of their dairy barn into a greenhouse. Phillip estimates spending $100,000 in total to complete the greenhouse conversion, including their $10,000 R&I grant funds. They paid for the remainder of the project with their savings. Phillip's estimate does not include the cost of the growing systems inside the greenhouse. The Barkers are growing primarily hydroponically in lines of two-inch pipes that are 80 feet long but also in grow towers, in the ground, and in pots. Phillip estimates they can likely fit 30 lines in their space, and they have installed eight lines so far. Their greenhouse crops include ginger, turmeric, microgreens, basil, rosemary, and aloe. In their indoor mushroom space, they're growing oyster, shiitake, and lion's mane mushrooms but are still troubleshooting with them. They plan to keep greenhouse production going through this winter, which will provide more stable labor for their employees. Phillip reports that expanding production through their greenhouse has increased their income. They were selling wholesale, through farmers markets, and to food banks but have since connected more with the local food movement and a church. They've begun experimenting with value-added production, offering dried and ground leafy greens; mushrooms; and herbs and roots such as basil, turmeric, and ginger. A market is interested in these offerings in capsule form, and the Barkers are exploring this opportunity.

Phillip reflected that, at this point, they do not wish they had done anything differently with their transition project. They're still researching materials for their hydroponic lines, as they are concerned about the plastic breaking down over time. They would prefer to use a safer, healthier material. Phillip agreed that completing the greenhouse conversion and beginning indoor crop production were accomplishments. He is proud of what they've learned throughout the process. He reports that growing in the greenhouse is easier and more pleasurable and that their employees enjoy working with the new systems and crops.