

INDIGOFERA SUFFRUTICOSA

A LOWCOUNTRY-BASED CULTIVATION AND
PROCESSING GUIDE



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A Training Program for Agricultural Service Providers in Coastal
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With contributions by the ICIC board

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Acknowledgement

Indigo is a plant that has been used for centuries, its vastness connecting an abundance of cultures around the world. While it has long served as a crop of craft, design, art, and spirituality, indigo also carries a difficult history. It is a spirited plant shaped by beauty, brutality, and resilience.

The radiant blue dye that indigo yields fueled colonial expansion and European wealth through the ravaging of Indigenous populations, the enslavement of Africans, and the pillaging of land across multiple continents. In this manual, we focus on cultivation in the Coastal Southeastern region of the United States, where the history of Lowcountry indigo begins with enslaved Africans. African captives carried with them agricultural knowledge, cultural memory, and spiritual relationships that made indigo, along with rice and cotton, viable cash crops in the Lowcountry. It was their land-based wisdom as seed stewards and plant breeders that made indigo foundational to American wealth.

That knowledge was not only practical, but ancestral. During and after enslavement in the United States and the Caribbean, African descendants maintained deep cultural and spiritual ties to this plant. What has persisted is not simply technique, but a lineage of resilience that continues to move through hands and soil. As a Black fiber farmer who cultivated indigo in the South, I understood this work not as a replacement for history, nor an attempt to redeem it, but as an offering, one that honors the lives and labor of those who had no choice in laying this foundation.

The Gullah Geechee people of the Coastal Southeast represent one of the few African diasporic communities in the United States whose culture and customs have not been erased. Their sustained connection to African traditions, language, and land is a living testament to the strength of their roots. It is their ancestral resonance that has awakened and guided many of us working with indigo today, allowing us to build upon a foundation they had no choice in laying.

Acknowledgement

As a descendant of enslavement in the United States, with multiple lineages rooted in South Carolina, I may not be able to name my ancestors directly, but they led me to the Lowcountry, and I have felt their presence throughout this journey. Their guidance lives in the labor, the patience, and the reverence required to grow, harvest, and work with this plant.

The members of this board have been deeply committed to learning from and working with indigo for nearly a decade. Their generosity in sharing knowledge, resources, and care has supported not only this project, but many others walking similar paths. It has been an honor to work alongside them and to help organize this manual. On behalf of the board, I extend sincere gratitude to all of the participants who contributed their time, labor, and insight to this work.

While this text is brief, the spirit surrounding this crop and this project cannot be fully contained within these pages. This manual is not intended to instruct or prescribe, but to share what we have practiced, in the hope that others will take what is useful, build upon it, and carry indigo to lengths beyond our imagination.

May each time we plant a seed or extract pigment, we remember the ancestors of the Lowcountry. And each time our hands are stained blue, may we recognize that we are working in tandem with ancestral contributions that stretch across land, water, and time. May this manual serve as a small offering toward what I hope will be a lasting contribution to the world of indigo.

- Ase,
LaChaun Moore

Project Overview

From 2023 to 2025, the International Center for Indigo Culture (ICIC) advanced its mission to inspire and build a vibrant farm-to-fabric economy. By leading the USDA Southern SARE “train-the-trainer” initiative, *Indigo and Companion Food Crops: Opportunities for Limited Resource Farmers in the Lowcountry of South Carolina and Georgia*, we highlighted, celebrated, and shared knowledge about the history and modern opportunities for growing and processing *Indigofera suffruticosa* plants in the region. This collaborative effort involved farmers, educators, artists, and service providers in hands-on programs designed to expand understanding of sustainable indigo cultivation, processing, and value-chain opportunities for indigo as a dye and as a companion crop.

Over the two-year grant period, ICIC and its partners implemented a multi-modal curriculum that included virtual workshops and immersive on-farm trainings. These sessions brought together growers, textile artists, academic partners, and community leaders to share practical skills for planting, harvesting, and processing indigo using both traditional and modern methods. Participants also explored marketing strategies to tap into increasing regional demand for natural dye products and agritourism experiences, helping to strengthen local economies while honoring cultural heritage.

Celebratory partner events enhanced these educational outcomes and highlighted the project's community impact. At Marshview Community Organic Farm on St. Helena Island, participants gathered with hosts and others to honor the historic legacy of indigo cultivation and reflect on the knowledge shared throughout the cohort. On Sapelo Island, Save Our Legacy Ourself (SOLO) hosted a hands-on harvest and processing workshop that brought together attendees from South Carolina and Georgia to directly engage with indigo grown on site, participate in dye-extraction techniques, and build connections across different landscapes and cultures.

These experiences highlight not only the technical skills gained but also the deep, intertwined cultural and community bonds renewed through once-dormant agricultural traditions. The results of this SARE training go beyond the field, empowering an expanding network of indigo ambassadors dedicated to ecological stewardship, creative expression, and economic growth in the Lowcountry. This free publication is the culmination of this grant. We hope it will continue to spread and offer open access to lessons learned and opportunities for communities across the Southeastern United States.

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Introduction

This manual is a step-by-step guide for farmers in the Southeastern United States (zones 7a-9b) on how to grow *Indigofera suffruticosa*, the main plant used to make indigo dye. Whether you're new to indigo farming or looking to refine your skills, this guide covers everything from planting to dye extraction.

In Part One, Planting and Cultivation, we cover the essential steps: preparing the soil, selecting the best location, preparing your seeds, and managing weeds and crops throughout the growing season.

Part Two, Harvesting and Pigment Extraction, explains how to properly harvest your indigo and extract the dye. You'll learn about water extraction, fermentation, and how to store and finish your dye.

In the final section, there is a bibliography and page of resources to help indigo growers navigate how to use their processed indigo.

This manual includes blank pages after each section for note-taking. It offers practical advice for growing and processing indigo, while also honoring the cultural history of indigo farming in the Southeastern U.S. We hope it provides valuable guidance for both new and experienced farmers in bringing this vibrant, historically significant, and complex crop to life.

Contents

1. Acknowledgment	1
2. Project Overview	3
3. Introduction	5
4. Part One: Planting and Cultivation	7
5. Part Two: Harvesting and Pigment Extraction	19
6. Resources	33
7. Glossary of Terms	41
8. Notes From the Board & Contributors	43

Part One

Planting & Cultivation
By LaChaun Moore

1

Site Selection

2

Seed Preparation

3

**Propagation &
Planting**

4

Field Management



Site Selection

Preparation: What to Know Before Planting

- Save a small portion of seeds for replanting or testing. Don't plant your entire stock.
- Be patient: *Indigofera suffruticosa* is tropical/subtropical and prefers planting when it's hot and dry, not early spring.
- Avoid sowing during heavy or consistent rain; light rain is acceptable but not ideal.

Site Selection

Choosing the Right Location



Sunlight:

- Prefers full sun, heat, and humidity but tolerates some semi-shade.
- Choose flat, clear land with sandy loamy, well-draining soil.
- For sloped areas, plant seeds at the highest point of rows to prevent water pooling during heavy rains or hurricanes.
- Generally pest- and deer-resistant, so fencing and pesticides are usually unnecessary.

Site Selection

Soil:

- Ideal soil is sandy loamy, a balanced mix of sand, clay, silt, and organic matter that drains well while holding nutrients and moisture.
- Southeastern U.S. soils are often naturally suitable for *Indigofera suffruticosa*; soil testing is optional unless you suspect nutrient deficiencies.
- For containers or raised beds, mix sandy soil and compost in a ratio of about 60–75% sand to 25–40% compost, adjusted based on compost texture.
- Soil should retain moisture without clumping or becoming waterlogged.



pH (Soil Acidity):

- Sandy loam usually ranges from neutral to slightly acidic pH, ideal for *Indigofera suffruticosa*.
- Clay soils are often alkaline; adjust pH by adding compost and sand for better drainage and aeration.
- *Indigofera suffruticosa* tolerates poor nutrients and acidic soils, so focus on texture and drainage rather than heavy amendments.

Seed Preparation

Scarification and Soaking

- Soak seeds overnight in hot water to soften hard husks and break down the black seed coat, enhancing germination speed and success.
- Use a heatproof container, cover to trap steam, and pour boiling water over seeds, then let them soak overnight.
- After soaking, some seeds will sink, husks will float, and the water will be slightly brown with an earthy smell.
- Plant seeds directly after soaking or strain them through a fine mesh. Husks don't need to be removed since they biodegrade naturally.
- If unable to plant the day after soaking, remove seeds within 24 hours to avoid rancidity. Avoid soaking for multiple days.



Seed Preparation



Dry Seed Preparation for *Indigofera suffruticosa* *(If Scarification Isn't Possible)*

- Crack husks gently using a mortar and pestle, rolling pin, or by rubbing seeds between hands, taking care not to crush seeds.
- Separate seeds from husks using a colander.
- Husk-free seeds can be planted directly or soaked overnight in hot water to speed germination.
- Follow the same straining and planting steps as soaked seeds.

Propagation & Planting

Direct Sowing *[Preferred]*

- Choose to sow in rows or broadcast based on your plot size and harvesting method.
- Small plots: dense broadcasting maximizes plant numbers and space efficiency.
- Large plots ($\frac{1}{2}$ acre or more): sow in rows with good weed control to simplify harvesting and enable crop rotation.



Starting Indoors

- If outdoor conditions are not suitable for direct sowing. Most direct sown crops catch up to indoor starts within a month. Plan to transplant around early June. Indoors starting improves germination success and early growth.
- Start seeds indoors aiming to transplant when outdoor temps consistently reach 80°F or higher, usually late spring to early summer.

Propagation & Planting



- Lightly cover seeds with soil, not too deep to avoid germination failure, not too shallow to prevent drying. Aim for 1/4" depth.
- Optionally, add a thin layer of unseeded wheat straw mulch to protect seeds, but keep it light to avoid smothering.
- Water gently to prevent seed displacement; drip irrigation is ideal.
- Water daily or when soil surface dries during germination (5–14 days). Pre-soaked seeds germinate faster.

Planting in Rows

- Make a shallow ditch along the row center by dragging a shovel handle sideways. Minimal effort is needed if soil is sandy and dry.
- Gently sprinkle seeds evenly in the ditch, avoiding crushing.
- Seeds naturally grow in clusters, so tight spacing is fine; try to distribute evenly.

Propagation & Planting



- Be patient - *Indigofera suffruticosa* waits for the heat and humidity of summer to really start growing.
- After true leaves appear and roots strengthen (around week 8), plants require minimal care and tolerate summer rain. In dry seasons, check soil moisture and water as needed.
- Once established, mulch grow beds lightly with straw or wood chips to retain moisture.

***Optional:** Spray plants occasionally with organic liquid fertilizer such as seaweed fertilizer or fish emulsion for strength and nutrition.

Field Management

Organic Weed Management

Plan weed control before planting to protect yield and ease harvest.

Key Notes:

- Taller indigo plants shade out many weeds naturally as they grow.
- Watch for invasive vining weeds that can tangle with plants; though they don't impact processing, they may be prickly or toxic.
- Effective Organic Weed Control:
 - Mow plot perimeters and between rows regularly to reduce weed growth and seed spread.
 - Use weed barriers such as landscaping fabric, coffee bags, cardboard, unseeded wheat straw, or wood chips.

Mulching “Lasagna Method”:

- Layer mulches from least to most permeable for best effect:
 - Impermeable layer (cardboard) on soil surface
 - Medium layer (unseeded straw)
 - Top layer (wood chips)
 - After seedlings are established, add more straw or wood chips throughout the growing season to keep moisture and suppress weeds.

Observations



Part Two

Harvesting & Processing

By Precious Jennings & David Harper

1

**Harvesting
Tools &
Techniques**

2

**Post Harvest
Processing**

3

**Fermentation
Completion**

4

**Filtration &
Drying**

Harvesting Techniques & Tools

By mid-July in South Carolina, a crop of *Indigofera suffruticosa* may already be about three feet tall and produce small pink flowers. Harvesting usually starts in early August and continues until October (before a hard freeze), or when the plants reach this stage of maturity. This process is specific to the subtropical climate of Georgia and South Carolina but may be applicable in other regions with similar climates.



Harvesting

Techniques & Tools

- Harvest stems with plenty of leaves, usually 2 to 3 feet long and about ½ inch thick or less. You don't want too many of the thicker, woody stems—they don't produce dye! Also, make sure to leave enough stems or plants with seed pods to harvest and save seeds at the end of the growing season.
- Use hand pruners or battery-powered hedge trimmers for small harvests.



- Choose leafy stems that are 2–3 ft tall and ½" thick. Avoid thick, woody stems—they don't produce dye and occupy space in the vat. Leave some stems with flowers for seed saving at the end of the growing season



- Lay tarps under plants to catch stems as they fall.
- Drag tarps with stems directly to a vehicle for transport as needed. Tarps help to avoid the extra task of collecting stems later.
- Harvesting can be a fun group event - invite your friends and family for a harvest party! Harvest estimate: 6 people 100+ mature plants (≈300+ lbs) in 30–45 minutes.





- Historically, in some regions where *Indigofera* species were cultivated, they were densely planted and harvested when the plants were shorter, more herbaceous, and less woody.
- If you're scaling up for larger production, use a farm tractor with a sickle-bar attachment.
- **PLEASE NOTE:** Set the bar high enough to avoid cutting thick woody stems near the base.
- **Caution:** Large machinery can be dangerous keep people clear during operation.
- Plants should be harvested when they are about 3 feet high, and can be harvested multiple times throughout the growing season.
- Indican content in the plants will be highest right before the plant begins to flower. Watching the plants closely for flowering will help determine optimal harvest timing.

Post Harvest Processing

- **Optional:** Line the bottom of the livestock water trough with heavy duty vinyl window screen to easily remove plant material upon completion.
- Trim stems.
- Weigh materials. Options for weighing: Add 5–10 lb bundles to a large produce scale. Combine bundles (50–60 lbs total) in a 100-gallon cattle trough. OR Create a Tripod pulley or use a large industrial scale to weigh your plants.
- Add ~60 gallons of water to the trough, enough that the plants can float but stay submerged.
- Submerge plants underwater using mesh and bricks, just enough to keep them below the water surface. Avoid packing the plant material too tightly; ensure the water reaches all the leaves for optimal extraction.



Post Harvest Processing



- Cover with a tarp; securely clamp around edges to prevent rain and debris from getting in.
- Keep water at 75–90°F for proper pigment leaching and fermentation. Options for water heating: Use a portable camping water heater or an outdoor propane burner with a large metal pot. OR a solar water heater.
- Skip heating if the ambient temperature is in the 90s. Or if daytime temperatures are 70–75°F and nights are in the 60s or lower, heat the water to 100°F to start.
- Ferment for at least 24 hours (20 hours in hot southern sun).
- Monitor liquid regularly, push plants down to distribute heat that may be building or if water temperature is uneven.

Filtration Completion

Check the vat every 5–6 hrs to observe changes.

- Signs it's ready:
 - Leaves yellowing and breaking down easily
 - Liquid is "thick", fluorescent aqua-green
 - Abundant blue bubbles and purple film on the surface
- Do not exceed 3 days—over-processed leaves reduce effectiveness and may spoil the batch. In colder evenings sometimes it cools and slows the process and extends ferment time, this is ok!
- This greenish-blue liquid is indican (indigo precursor, looks like dark antifreeze) and requires oxygen for the next step.



Filtration Completion



Proceed to aeration:

- Stir/add air to the indican liquid with kayak paddles (traditional method) OR Automate using a sump pump + PVC pipes to circulate like a fountain.
- Aerate 30–60 min, until liquid turns blue–dark dark greenish blue—this means indigo particles are forming.
 - **Test:** Remove a pint jar of the liquid, sprinkle some pickling lime, and stir. Let it settle for a few minutes. If blue sediment settles and leaves clear brown liquid on top, you are ready to stop aerating!



***Optional:** When aerating, excessive bubbles may form and start to come out of the vat; you can sprinkle a few drops of neutral oil to dissolve them quickly.



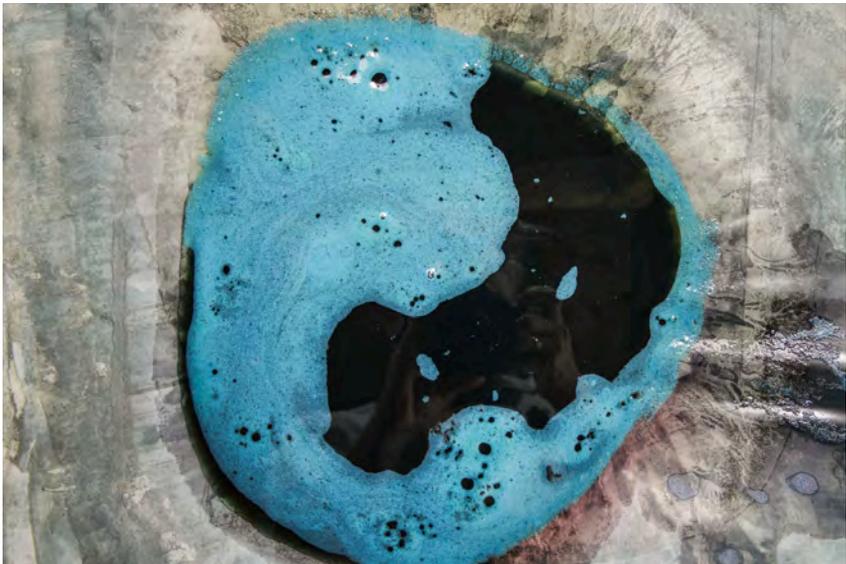
- Add pickling lime (calcium hydroxide, $\text{Ca}(\text{OH})_2$):
- Mix a few tablespoons of lime with some vat liquid in a small bucket.
- Slowly pour the slurry back into the trough.
- Add gradually, checking pH often with a hand-held meter—target pH 10. Hand-stir gently with a wooden stick and check the pH.
- Avoid adding too much lime, which will make the final pigment less pure.

Filtration & Drying

Let the liquid in the trough settle for at least 24 hours; indigo will sink to the bottom (as in the test jar). Check the top layer for signs of completion.

Troubleshooting:

- **Clear brown water:** means good, the pigment is settling.
- **Dark Greenish or blue water:** means add more lime.
- **Brightish green water:** continue aerating.
- Once pigment settles at the bottom, it is stable, and removing the water immediately is not necessary.



Filtration & Drying

De-watering (Indigo Vat).

Extract the nutrient-rich top layer. Use a small bucket or a transfer pump with a hose to remove the brownish-gray water at the surface carefully. This layer is rich in nutrients and ideal for watering your garden (check the pH and adjust if necessary, with vinegar).

Avoid disturbing the valuable indigo layer.

As you remove the top water, you'll notice a wet, indigo-rich slurry settling at the bottom. Be extremely careful not to stir or disturb the deep blue water beneath—that's where your indigo pigment resides!

Preserve the indigo slurry.

Once the top layer is gone, you are left with a deep blue, indigo-rich liquid. Keep it undisturbed to preserve as much pigment-rich water as possible.

*After aerating and adding lime, your indigo becomes stable and can be stored for filtering at a later time (the high pH prevents bacteria growth). Keep it in an airtight container with as little air exposure as possible!



Filtration & Drying



Filter the indigo slurry. Pass the indigo through colanders (or whatever you have decided to use as a filter system) lined with natural silk (e.g., crepe de chine) or a table-screen using 25-micron nylon filter fabric. This removes most of the sediment while allowing the liquid to drain slowly.

Allow the sediment to settle. Over several days, the water will drain, leaving behind indigo sediment that looks like wet mud with the consistency of yogurt.

Gently redistribute the mud. Use spoons or squeegees to move and level the mud as it continues drying carefully. Catching the filter water when you shift is helpful, as moving the mud tends to push some indigo through the screen.

Filtration & Drying

Wash away impurities. Clean the mud using diluted white distilled vinegar (mixed with water). Repeat this rinsing process multiple times to remove lime residue and other impurities. Dry until thick and sticky when the mud is a dense, peanut butter-like consistency or is easy to transfer to your preferred drying method.

Thoroughly dehydrate. Let the paste dry for a few hours using a dehydrator or in indirect sunlight until it becomes firm and completely dried into cakes. Spread onto a stainless-steel tray and transfer to a drying oven. Dry at low heat, below 110°F, for the best results.

Store or process the dried indigo. You can keep the dried indigo in a dry, airtight container or grind them into a fine powder using a coffee grinder or mortar and pestle for easier use later.

Optional: Use wet mud directly in vats. For dyers using organic indigo vats, the wet mud can be advantageous since it reduces. Be sure to store it in an airtight container filled to the top to minimize air exposure.



Observations



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for learning more about indigo

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GLOSSARY

Aerating Introducing air into the indigo liquid—traditionally by beating, stirring, or pumping—to activate oxidation and help the blue indigo pigment form.

Broadcast A method of sowing seed by scattering it evenly over the soil surface rather than planting in rows.

Fermentation A natural chemical process in which harvested indigo leaves soak in water and begin to break down, releasing the plant's color compounds into the liquid.

Indican The chemical compound (glycoside) naturally occurs in indigo plants (and in human urine). It is a colorless precursor to indigo dye. When the leaves are crushed, enzymes are released, removing sugars in the leaves, releasing indoxyl. Indican -> Indoxyl

Indigofera suffruticosa A species of indigo-producing plant (in the legume family) native to South and Central America. It is cultivated for its leaves, which contain the compounds used to produce natural indigo dye.

Indigotin Another term for the insoluble compound that produces indigo pigment.

Indoxyl Produced through reduction (extraction) when two molecules of oxygen are converted after the glucoside bond has been broken (via heat/water/maceration). Indoxyl is a colorless molecule present in extraction, which appears turquoise due to its blue-green fluorescence in daylight. Indoxyl + Indoxyl -> Leucoindigo -> Indigo (indigotin)

Leaching The process of drawing soluble compounds out of plant material. In indigo processing, it refers to releasing indican and other dye precursors from the leaves into the soaking water.

Leucoindigo (indigo white) An intermediate molecular state (after the release of glucose sugars) between indoxyl and indigotin in which the pigment in this acetic state can be directly applied to various protein fibers. Leucoindigo \rightleftharpoons Indigo (indigotin)

Oxidation The process of leucoindigo converting from yellow-green to blue upon the addition of oxygen, after fibers are removed from the vat.

Pigment The solid, colored indigo material created after oxidation; collected from the slurry, settled, and dried for dyeing. Pigments do not fully absorb into fibers and indigo requires reduction by the addition of alkalis.

Reduction A molecular conversion creating soluble indigo leuco compound (or leucoindigo). The vat looks yellow-green at this stage. Reduction is the opposite of oxidation.

Sediment The heavy indigo particles that settle at the bottom of the container after the slurry is allowed to rest; this sediment becomes the final pigment once dried.

Slurry A thick mixture of water and finely suspended indigo particles created during processing, usually after beating or aerating the fermentation liquid.

Vat Dye Pigments that are insoluble in water which require an alkali reduction in order to bond with the fibers. Once the fiber has been removed from a vat, the oxidation converts the pigment to a stable, insoluble compound.

Board & Contributors

As an advocate of the history, the traditions and practice of indigo, I have found the SARA grant has enriched the community with its indigo programs of education, research, training workshops, and connections with a wider span of engagement through Georgia, North Carolina and South Carolina.

-Arianna King Comer

My journey with indigo began when my colleague, Jim Bitler, first identified Ossabaw Island's *Indigofera suffruticosa*. Soon after, the Ossabaw Island Foundation (TOIF) launched its indigo workshops featuring Donna Hardy, inviting participants into the traditional, hands-on process of transforming fresh leaves into brilliant blue dye. Hardy shared Ossabaw's indigo seeds across the region. TOIF continues to host annual September workshops. My favorite part of these programs is connecting modern learners to the island's eighteenth-century indigo story and honoring the skilled labor of the enslaved people who once produced this iconic dye.

-Elizabeth DuBose

The last five years working with indigo have been a journey shaped by both love and grief. I first received an indigo kit in early 2019, a gift offered during a time of profound personal change. After making my first vat, I continued developing my natural dye, fiber, and performance practices. In the fall of 2022, a mutual friend connected me with Caroline Harper of CHIdesign Indigo, seeking help with indigo processing, and that moment marked the true beginning of my deeper work with the plant. Indigo has become a connector and a teacher—an alchemical practice in impermanence. Through it, I've learned plant knowledge, science, and industrial and agricultural processes, continually weaving this research into my art, movement, and improvisational way of living. The past lives in the present, and the present shapes what comes next.

-Precious Jennings

His artistic practice is deeply influenced by ancestral heritage. As a papermaker of color, he has expanded the boundaries between paper and textiles, resulting in sculptural works. For the past 15 years, he has experimented with indigo and handmade paper to create garments and accessories that function as both wearable and sculptural art. His work is grounded in a combination of hand papermaking and traditional African dyeing techniques, utilizing indigo derived from plants that once thrived in South Carolina's Low Country. Serving as a board member of The International Center for Indigo Culture, he continues to investigate new possibilities, traditions, and creative practices.

- Tony Williams

As an indigo grower and producer with CHI design indigo, it has been such an honor for me to join in the co-creative spirit of this important publication -- with the pioneering textile artists, natural dyers, educators, growers, and community leaders in the Lowcountry of the Southeast and the Southern SARE team. We all need the magic of indigo now as much as we ever have -- the living plants, their transformative blue color, and the collaborative culture that brings us together.

-David Harper

These hands-on indigo trainings have been a journey in teaching and learning about how we treat our beloved seeds, land, and one another. It's been an honor and joy to come together on ancestral lands, where we have shared stories, traditions, and creative practices that uplift and heal us together, in sacred, creative community. These practices in the community are deeply valuable and worthy of our time and attention. Creating an accessible and safe space has unfolded opportunities to explore indigo in ways that I had not imagined at the beginning of this journey.

-Heather Powers



A Note from Our Host Farm

It is important to say that our shared times of engagement, sharing and making connections at our indigo demonstrations, is the highlight of our outreach to share new ways of utilizing the land as an economic asset. We want to express that each time we meet, adds another layer of interconnectedness, resilience, and knowledge, which strengthen our commitment to ensuring that the goal of making indigo an important economic engine in the future, becomes a reality.

It has been our pleasure to use our farm and indigo plants as the demonstration space for International Center for Indigo Culture organization. Each time more community members get to learn and experience ancestral, sacred indigo farming, harvesting, and processing practices they also get closer to nature, which is the foundation of becoming vital stewards of the land.

Sarah Reynolds Green
CEO + Founder
Marshview Community Organic Farm



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