Milkweed, Wool, and Ecocentric design in New York State

As human induced climate change threatens the wellbeing of the earth and its inhabitants, as well as the stability of global supply chains, milkweed floss, in combination with local wool, is explored as a local, native, resilient, fiber source that requires little processing for textile application.

An ecocentric sourcing and production method is explored involving mindful wild harvesting, local sourcing, and small scale craft production using ancient methods.

The combination of wool and milkweed floss was explored for its synergistic properties through experimentation with dry and wet felting methods and yarn spinning, incorporating wool from varying breeds, blending methods, and ratios of milkweed to wool.

Based on this exploration, 3D hand/ wet felting was used to transform loose fibers directly to wearable complex 3D forms without standard processes such as spinning, weaving, cutting and sewing and the waste that typically resolves from them.

Local New York State Milkweed floss

The Milkweed plant is considered an “Umbrella plant” offering value to a variety of organisms as a native perennial pollinator. The widely loved but endangered monarch butterfly relies on the milkweed plant as a birthing place and vital food source for caterpillars, possessing toxins that protect them predators.

The common milkweed occurs naturally in abundance in NYS but is often perceived as a difficult weed. Presenting the common milkweed as a textile fiber source (that can be harvested non-disruptively), instills value into the plant and supports its proliferation, ultimately supporting the wellbeing of the local ecosystem.

Local New York State Wool

According to the 2022 New York Census of Agriculture, 1029 of the 1627 sheep farms in New York are small, having only 1-24 sheep. Out of the 1627 farms, only 688 produced wool. Based on this data, and first hand accounts, there is a massive gap in potential for wool production. A shortage of mills, lack of connection between rural and urban New York, and lack of accessible streams for small producers makes it difficult for small animal farms to successfully channel their wool into the market successfully and fiber is often discarded or left to rot. I am often gifted wool by farmers who have excess that they don’t have a stream for, further demonstrating the potential of unused fiber.

Sourcing
Mindful Wild Harvesting

In New York, seed pods ripen at varying times from early to late fall. At this point, Monarch butterflies have already begun their migration towards warmer climates the removal of seed pods is not disruptive to their life cycle. Seed pods were inspected before harvesting, to ensure seeds had reached maturity on their mother plant, and only a third or less was taken from abundant populations.

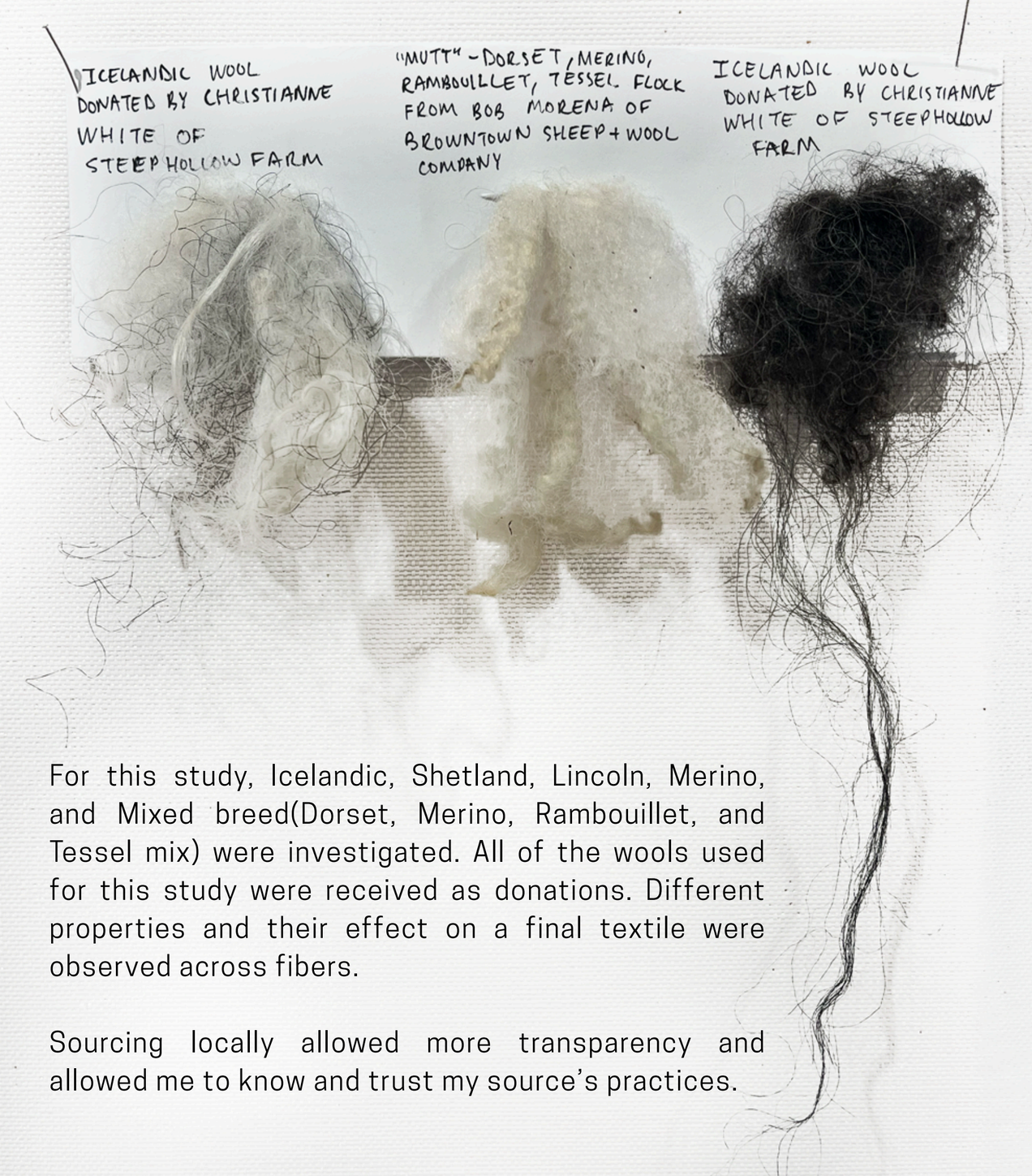
Seeds require a period of cold stratification (1 - 9 weeks of wet and cold (5-9°C) conditions or about one year of dry storage) in order to break dormancy and successfully germinate. seeds were stored and spread in a similar manner to their natural life cycle.

Myself and Dave of Eastern Monarch Butterfly Farms, NY and a copy of his children's book "Davey's Butterfly Farm"

My wild harvesting method was guided by "Indigenous Principles of Wild Harvest and Management: An Ojibway Community as a Case Study" by Chantel M. LaRiviere & Stephen S. Crawford and from the "Honorable Harvesting" chapter of Braiding Sweetgrass by Robin Wall Kimmerer, and David O'Donnell, a local New York State Milkweed Farmer and community organizer with a focus on milkweed farming in support of the monarch butterfly.


Unripe seed pod – green shell, light seeds...


Mature seed pod – dry pod shell, brown leathery seeds



For this study, Icelandic, Shetland, Lincoln, Merino, and Mixed breed(Dorset, Merino, Rambouillet, and Tessel mix) were investigated. All of the wools used for this study were received as donations. Different properties and their effect on a final textile were observed across fibers.

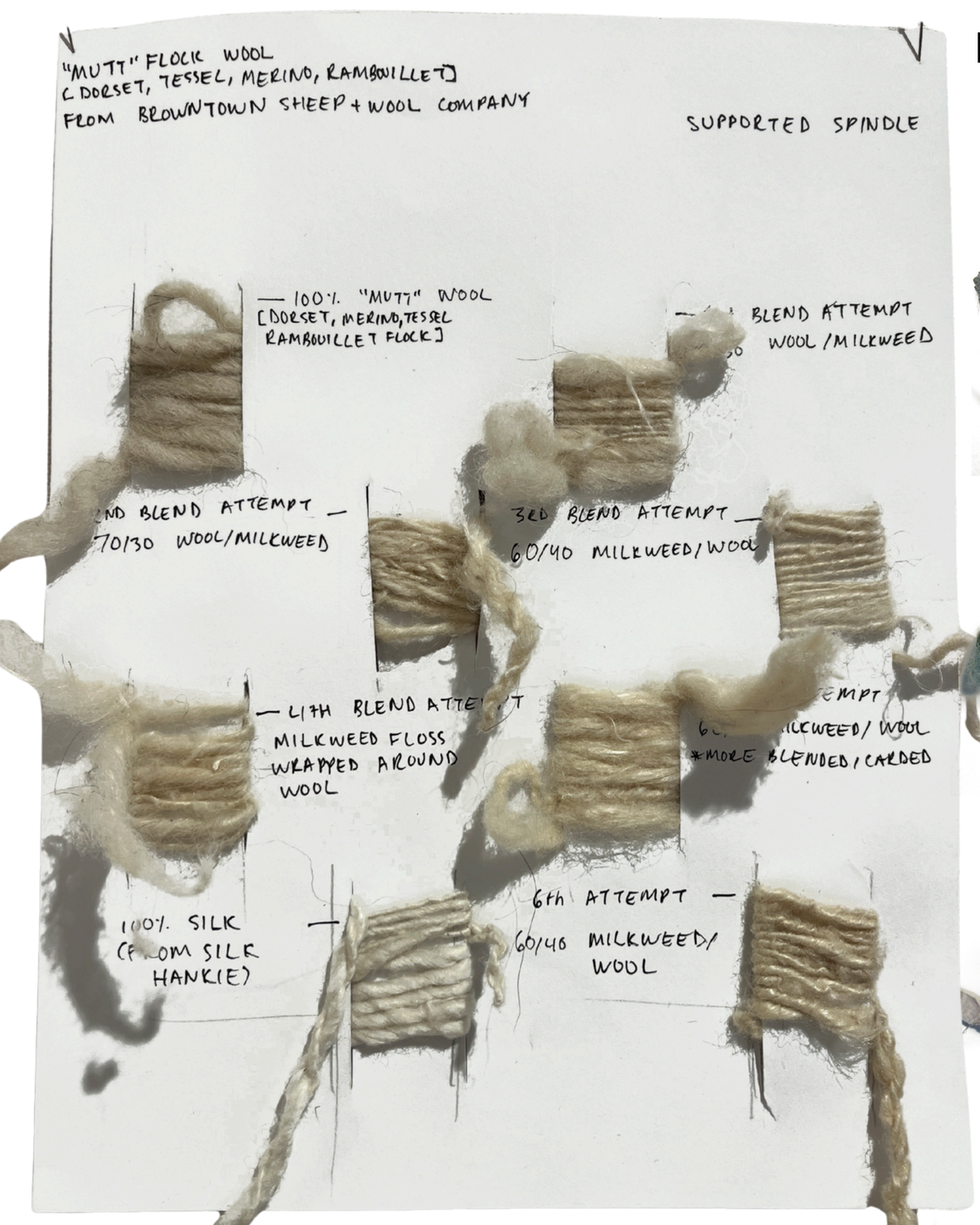
Sourcing locally allowed more transparency and allowed me to know and trust my source's practices.

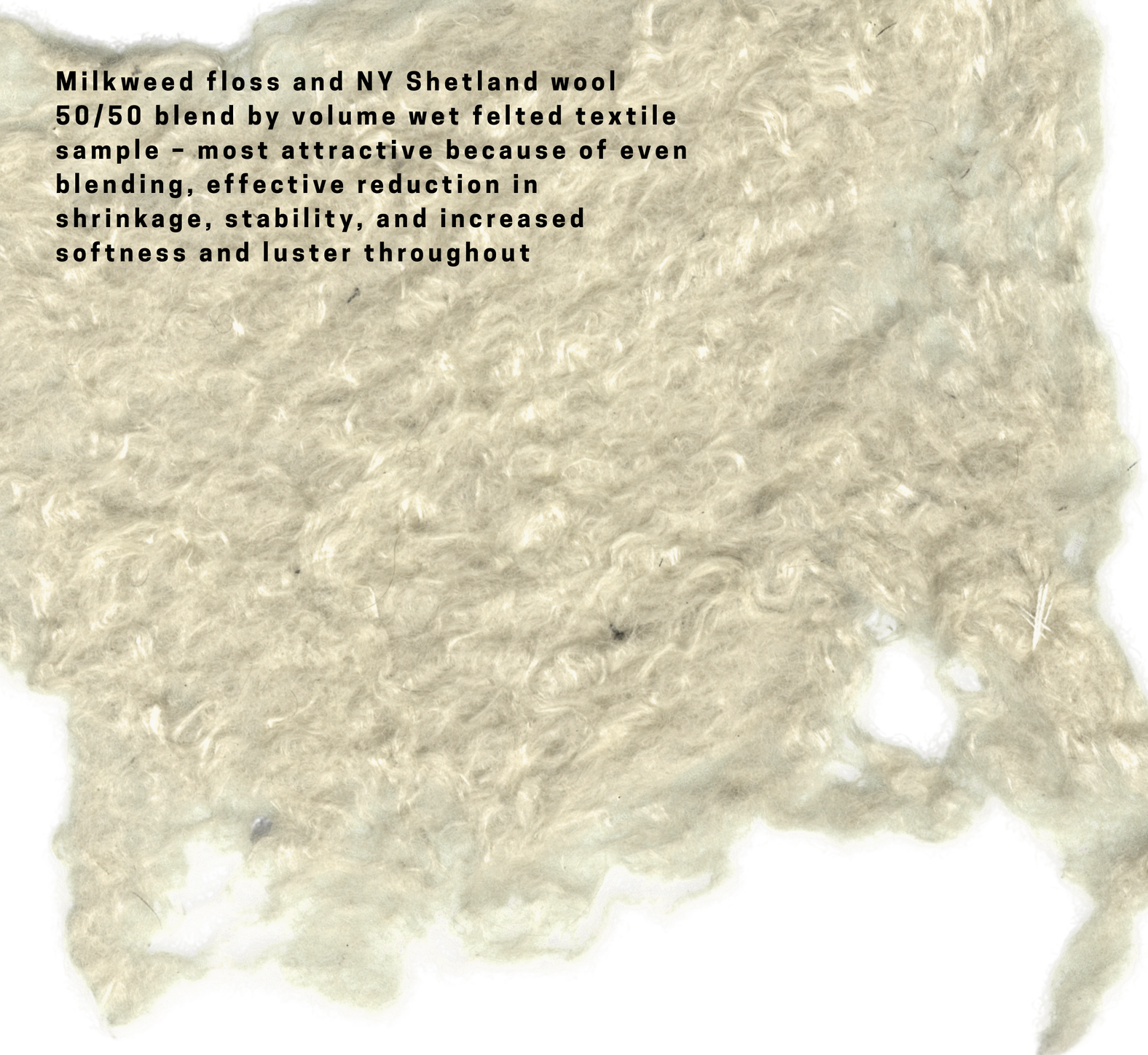
felt samples – testing different ratios of milkweed and wool (various breeds) and methods (wet vs dry felting)

needle felting method with feltproloom

Wet felting method with bamboo roller, bubble wrap soap, warm water, and agitation

hand spun samples and aditional experimental swatches using wet felting, collage, and natural dye methods





Milkweed floss and NY Shetland wool 50/50 blend by volume wet felted textile sample – most attractive because of even blending, effective reduction in shrinkage, stability, and increased softness and luster throughout

Both fibers are underutilized, possessing both unique and overlapping properties which may combine to optimize their individual strengths and counter their respective weaknesses. Milkweed in textile applications on its own lacks structural stability, but offers many other attractive qualities in a textile, being lustrous, soft, lightweight, insulating, and breathable. Wool is also known for its insulating properties, and varies greatly in softness, luster, and durability based on breed, animal age and conditions. Although wool is widely used in the industry, many sheep farmers are limited by standards of softness required for wearability. Milkweed floss's smooth surface and thin diameter presents potential as a local alternative for an additive softening fiber. As milkweed floss is brittle due to its ligno-cellulosic composition and hollow structure, the strength and cohesion of wool makes it an attractive partner with milkweed floss. The milkweed adds luster and softness increasing the surface quality and hand of a woolen textile that could be similarly achieved through the addition of silk. Wool's tendency to shrink when wet felted may be reduced by blending with another non-felting fiber, allowing more yardage to be achieved with less fiber. 3D felting allows easy repeatability once a mold is established and circumvents waste and energy in traditional cut and sew methods.

3D felting method

Blend/ card wool

Measure/weigh out fiber ratio

Spread out wool roving and add a layer of milkweed floss

Roll fibers to blend (repeat until even)

Lay dry fiber over 2D resist

Flip over and add fibers on other side
*be sure to overlap fiber over joining sides

gently add warm water and soap and begin agitation to felt over 2D resist

Remove resist and continue agitation

Transfer to 3D form (hat block) and continue agitation

place black walnuts inside as resist and continue agitation

** once a mold is established, the process is easily repeatable

Calculating shrinkage

12"

12" →

9"

~ 9"

s = shrinkage coefficient for width and length
F= felted length
0= original length
s = F/0

s = 12/9 = 1.33

Thickness / compression can be understood by the amount of fiber(g) per area, or by the thickness dry compared to felted.

3" →

0.25"

T = shrinkage coefficient for thickness
F= felted thickness
0= original thickness
T= F/0

DRY RATIO
25 g fiber/ 12"x12" dry
2.083 g/ 1 in^2

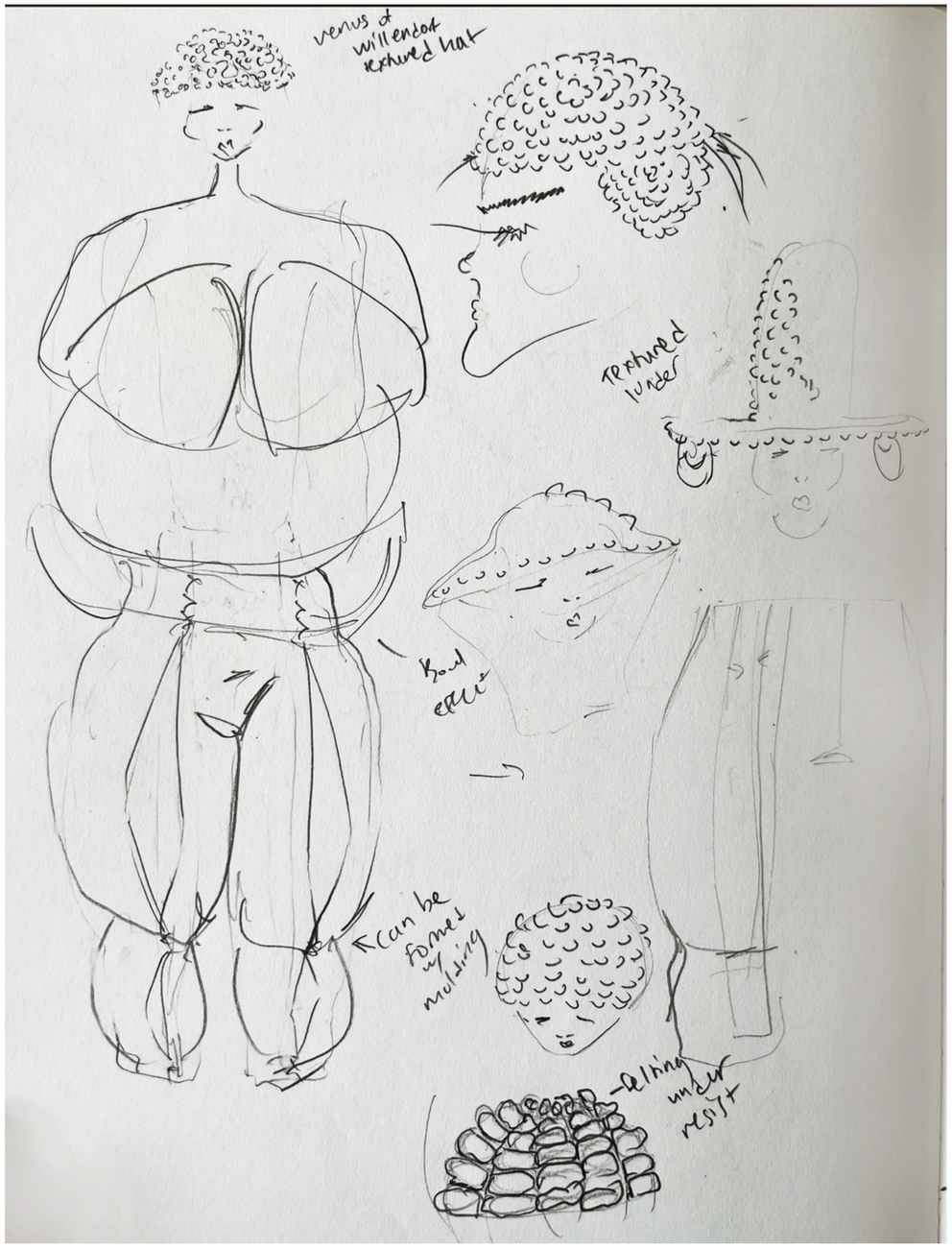
→

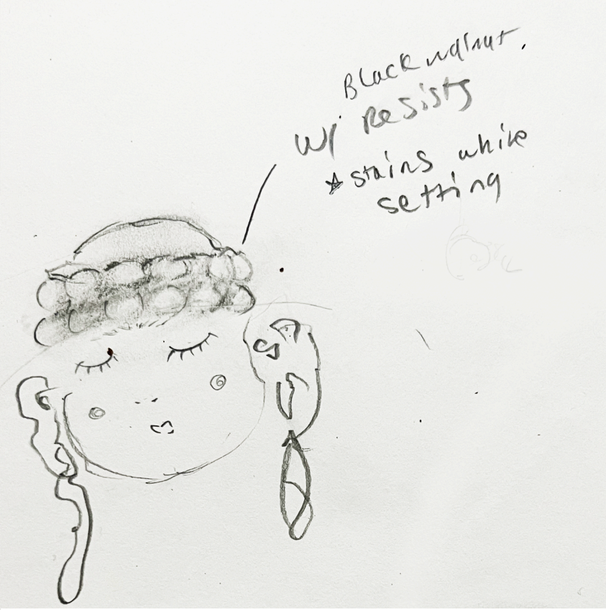
FELTED RATIO
25 g fiber/ 9"x9" felted
2.778 g/ 1 in^2

T = 3/0.25 = 12

When a seed pod ruptures to release her seeds – the shell the shell, in the midst of drying, ranges in color from a soft green to an ashy gray. Fuzzy and bumpy and spiky – soft and foreboding. escaping her from the inside are soft leathery brown seeds, each with a tuft of silky hair.

The pod at this moment is symbollic of fertility-- the potential of birth and life. Parallels are drawn to the symbol of fertility, the infamous Venus of Willendorf.


venus of willendorf extra hat
textured lunar
Bad effect
can be formed by molding
clothing under resist


Black walnut,
W/ Resists
* stains while setting


I DO
HOMEWORK
IT HURTS

HOMEWORK