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Dogbane
(Apocynum cannabinum L.)

A Modern Spinner’s Approach to an Ancient Fiber
Abstract

This study's purpose is to determine whether dogbane, a bast fiber used by the native peoples of North America, is a viable option for the modern spinner. Dogbane can be wild-harvested in most of North America, and ample anthropological and archeological evidence shows that native peoples of this continent used it for a wide variety of textile and medicinal purposes.

As flax and hemp are also bast fibers, this study makes a case for processing dogbane with similar methodology, and its results support the hypothesis. In like manner, dogbane readily responds to hackling and carding as one would for flax and hemp and allows for the gathering of tow dogbane fibers, a new source of fibers.

While most native groups finger spun or thigh spun dogbane, this study considers the modern application of spinning processed bast fibers on a wheel, which was found to be not only possible for dogbane tow and line but efficient. Wet spinning and plying seem to be the best option.

Both tow and line fibers spun as a 2-ply yarn lend themselves to all manner of textile application. Dogbane singles were problematic, and singles made from tow lacked the strength and durability required in weaving applications. Singles made from line dogbane fibers were stronger than singles of tow fibers but required sizing in order to withstand the abrasion and tension needed for weaving. Twist direction in spinning dogbane was found to have no effect on the finished yarn. It is hypothesized that end-use should determine twist direction, presenting a point for future study. While dogbane is usable in its unfinished state, scouring produces a softer, cleaner yarn. The dyeability of the fibers was not examined in this study and introduces a nice extension of this project.
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Introduction

Relatively unknown to the modern fiber artist, dogbane (*Apocynum cannabinum* L. or Indian Hemp) has been used for fiber and medicine by the North America's native peoples historically. Dogbane grows wild across North America and is a bast fiber, like linen or hemp. The study aims to determine the best way to harvest, process, spin and finish this ancient fiber source in ways that translate to the modern spinner.

Much of what we know about dogbane’s use comes from archeological sites across North America. We can also glean information about its processing by considering records of anthropologists and naturalists at the turn of the century. One of the study’s limitations is finding verified documentation about how early peoples processed the fiber after removing it from its woody center. As a result, one must rely heavily upon information passed down through generations of native peoples, much of which has been lost to history. At this time, members of the primitive skills community currently conduct experimental archeology, and these people provide the best resource for learning how to find and process the fiber.

It is important to remember that most native groups used what was abundant in their areas. Dogbane represents just one of many different bast fibers used by the natives on this continent. Today, finding a local source for dogbane poses a limiting factor in one’s ability to use it, as it is considered a noxious weed in many places across the continent. As a result, what was once a plentiful resource has been systematically removed from the landscape.

Identification

One must find the plant before one can harvest its fiber. Dogbane stems reach 2- to 6-feet tall and contain a milky juice, similar to milkweed’s. Its small elliptical leaves measure 2-3
inches long. "The flowers are small and inconspicuous, cylindric to urn-shaped, and greenish pink" (Stevens, 2006). Dogbane likes to grow "in moist places near riparian areas along streams, springs, levees, roadsides, and waste places...throughout British Columbia and east across the United States...it is no longer common in California, and many traditional gathering sites are gone" (Stevens, 2006). The best way to find this fiber is to enlist a person who knows the plant and its habitats as a guide. Knowing what it looks like helps; examining the look and feel of the stalks allows identification. Finding dogbane in the autumn before the leaves fall off facilitates identification. After the leaves fall, it becomes indistinguishable from willow. **Figure 1** shows dogbane in the summer and fall.

**Figure 1: Dogbane in the Wild**

![Dogbane in Summer](image1)

![Dogbane in Fall](image2)
History

Dogbane was used throughout North America by native groups as both textile source and medicinal plant. According to Greenlee (2018), dogbane, like milkweed, contains a sticky, milky sap. There are cardiac glycosides in the sap and the root also contains cymarin, a cardiac stimulant.

The fibers are not only strong but may have another property that made them suitable for use in food containers. The Indian hemp plant contains glycoside, apocynamarin, that is reportedly lethal to cattle and horses, but not humans...

Entomologists have studied Indian hemp as an insect repellent. Although not useful against all insects studied, they found that extract from the twigs and stems of Apoocynum Cannabinum were effective against the larvae of the codling moth and the black carpet beetle. It is possible...that the people of the Columbia River, perhaps unknowingly, utilized a natural repellent in the containers they needed to store their important reserves of food and roots and other valuables. (Schlick, 1994, p. 17)

"Dogbane is considered one of the bast fibers, which “are derived from a portion of the stems of dicotyledonous plants that lies between the outer bark and the woody central cylinder” (Teague, 1998, p. 14). Many bast fibers were used by the natives of the Americas. According to Teague (1998), the principal bast fibers used in the Southwest were Indian hemp (dogbane), milkweed, mesquite, cliff rose and willow. Leaf fibers like yucca and agave were also used. She goes on to say that, before the introduction of cotton in the Southwest, they were the only sources of plant fiber in the region. Even after cotton became the principal fiber in the region, bast and other plant fibers were still widely used “for utilitarian bags, nets, and cordage but retained their earlier prominence in woven textiles only in the southern Southwest, where little cotton was grown and where traded cotton was not available in large quantities” (Teague, 1998, p. 14).
Bast and leaf fibers were universally the most common source of yarns in the early cultural horizons. They continued to be used extensively in northern Mexico, southern and central Arizona, and the Mogollon areas throughout their history, even in loom woven textiles. (Kent, 1983, p. 24)

In her book *Plants in British Columbia Indian Technology*, Turner states that “Indian Hemp, spreading dogbane, stinging nettle, and fireweed were spun into twine, fishing lines, and nets” (Turner, 1947, p. 28). Schlick (1994) states that, while many tribes in North America used Indian hemp, and other fibers for cord or string, the natives of the Columbia Plateau used them extensively. “Spinning hemp and other fibers was an important skill along the river, where the people used twine for a range of activities from satisfying the humblest household need to creating the most complex object of art” (Schlick, 1994, p. 16).

While abundant information about the tribes in the Southwest and many of the Western and Northwestern native groups exists, information on the tribes of the East and Midwest is elusive, presenting a limitation for this study. Research seems to support the deduction that dogbane was one of the many fibers used by all native groups on this continent. In her article in the Summer 2014 Spin Off Magazine, Pappas (2014) notes that one of the fibers used to make yarns in the Southeast was “Dog’s Bane.” Drooker’s 1992 work, *Mississippian Village Textiles at Wickliffe* discusses different types of textiles made and used by tribes of the Midwest and Southeast. While she lists different bast fibers, it is unclear whether her references to “Indian hemp,” “wild hemp” or “native hemp” signify *Apocynum cannabinum* L. The only instance she specifically mentions *Apocynum cannabinum* L. is in the description of a textile from the Etowah tribe where she purports that one of the yarns in it might, in fact, be *Apocynum cannabinum* L.

All native groups researched in this study used dogbane as one of many fibers for their cordage and string production. Modern society takes for granted its sources of string, rope, cordage and the like for binding purposes. Conversely, in primitive and ancient worlds,
cordage making was an important part of the culture. Twine or cordage, whether made of animal or plant material, was vital for everything – from holding together a shelter to hunting, basketry and clothing construction. Once a fiber was made into cordage (which is basically a 2-ply yarn), it was used for a variety of things, including rabbit nets.

According to Kent (1983), one of the “two most dramatic archeological textiles in the Southwest” was a net made from Apocynum found in the White Dog Cave of Northern Arizona. It was found, leaf-wrapped, in near-perfect condition: 240’ long and 3’ 8” wide. Another such net was found in Hogup Cave (Aikens, 1970) in Utah. Reports describe its being an approximately 140’ long and 4’ wide length of 2-ply, S-twist cordage. Wheat (1967) asserts “Indian hemp probably reached its greatest perfection in the manufacture of netting for trapping rabbits, ducks, fish etc” (Wheat, 1967, p. 59). She describes a net made by a Captain Wasser that measured more than 300’ long of cordage the size of kitchen twine and “so uniform it is hard to believe that it was made by hand” (Wheat, 1967, p. 59). Turner (1947) states that the Okanagan, Thompson, Lilooet, Shuswap and Kootenay specifically used “Indian Hemp twine for fishing lines and nets - because it keeps its strength under water and will not shrink - and for deer nets, slings, bowstrings, bridle ropes, nooses for game birds, hide stretchers, for binding implements...etc” (Turner, 1947, pp. 170-171).

In the Columbia plateau, dogbane was used for dip nets and rabbit nets, cordage, snares and the “counting day balls” (itiamat). “From the time of her marriage, a woman would record her life’s events on this calendar ball by spinning a length of hemp and tying knots as each day passed. She marked births and deaths and other extraordinary days with beads, shells or other talismans” (Schlick, 1994, p. 8). When the balls grew too large to handle, a new ball was started.
Archeological evidence supports dogbane's use in clothing and similar textile applications, as well. Kent (1983) describes a multitude of warp-faced belts made throughout the Southwest.

Bands were made to serve a wide variety of functions: tumplines, cradle bands, belts, ties, skirt and apron waistbands. Many different processes were employed in their manufacture, including warp-faced plain weave, warp twining, weft-faced plain weave, tapestry, weft wrap, alternating gauze, and four variations of weft twining. Yucca, apocynum, human and animal hair and from A.D. 600 on, cotton, were used in band construction. (Kent, 1983, p. 118)

**Figure 2** depicts fragments of tapestry-woven dogbane from a 2017 exhibit at the Farm and Ranch museum in Las Cruces, NM, featuring weavings of New Mexico. These fragments, dated to 1100 AD, were found in a cave in Chihuahua, Mexico. They were on loan from the museum of Indian Arts and Culture in Santa Fe, NM. Ric Rao, who helped curate the exhibit photographed them for this study. The fineness of the fibers and complexity of the weaving are spectacular.
Turner (1947) says that Indian hemp was used for "sewing moccasins, clothing, baskets, birch-bark canoes and cat-tail mats, and for weaving tumplines, garments, baby bedding and bags" (Turner, 1947, p. 171). It was often woven with other plant fibers such as silverberry, willow, sagebrush and tule, and, sometimes, spun with deer hair for garments. Drooker (1992) relates depictions by early European chroniclers of the clothing worn by the Mississippian people: women wore a wraparound skirt, men and women both wore mantels, and both garments were rectangular. She says “during earlier Mississippian times, many other animal fibers were available for spinning. Plant-stem fibers, however, including grasses, hemp, nettle, milkweed and the inner bark of various trees, seem to be more frequently mentioned by the early chroniclers in regard to cloth-making” (Drooker, 1992, p. 76).

Dogbane was also used in basketry to make twined root-digging bags, twined flat bags and hats. Once a part of daily clothing of the Mid-Columbia people, twined hats are now used only for ceremonial purposes.

The basketry hat worn by the women of the Mid-Columbia is commonly described as "fez-shaped" or having a truncated cone. Twined of taxos, or Indian hemp and yai, or bear grass, the hats have, with few exceptions, a three-part zigzag design around the sides in dyed bear grass and other fibers. (Schlick, 1994, p. 35)

The round, twined bags for carrying roots are most commonly known as sally bags. Native tribes refer to these bags as wapaas or aqw’alkt, depending on the tribe. Unlike twined hats, these bags still fulfill a utilitarian role for the tribes of the Mid-Columbia.

Round twined bags, made primarily for holding or carrying roots during the digging season, were also used to gather medicines or other foods such as acorns, hazelnuts, mushrooms, and sunflower seeds, as well as to store a variety of household and personal goods. (Schlick, 1994, p. 54)

Schlick (1994) remarks that archeologists have found remnants of Indian hemp cordage and textiles at the earliest sites in the Columbia River area. Additionally, there is evidence that the bark of hazelnut, willow root, tule and cattail were used as foundation materials for
these bags. After colonization, jute, flax and hemp from gunny sacks were unraveled to provide a new, free material from which to make these bags.

The need for flexible, tightly woven bags that take up little space when not in use led to the flat twined bag in the Mid-Columbian tribes, specifically the Nez Pierce. "The bag looked much like a flour sack in form but was stronger in construction. Like a flour sack, the bag lay flat when empty, but would expand to hold a large quantity of food or other valuables" (Schlick, 1994, p. 143). These bags stored roots and nuts, in addition to personal belongings. Because they were flat they were easy to store in limited space when empty. Originally, these bags were made from dogbane. Over the years, commercially available fibers, such as cotton, corn husk and wool replaced dogbane in their creation. They are now commonly referred to as "corn husk bags."

It also appears that dogbane was a valuable trade resource. Schlick (1994) says that "three bundles of processed fiber the size of your thumb or one large bundle of prepared twine were worth as much as a horse" (p. 36). Turner (1947) suggests it was a common trading product among the Indians of the Southern Interior and the Coastal peoples. "In the early days of contact with the white man, a large bundle of prepared twine was worth as much as a horse in the Okanagan area" (Turner, 1947, p. 171).

**Dogbane Today**

Today, dogbane is mainly used by primitive skills practitioners and some native peoples in an effort to keep their ancestral knowledge alive. According to Schlick (1994), preparing dogbane is a lost art among the Mid-Columbian tribes, although recent attempts at revival are occurring.

Primitive skills communities mainly use dogbane in cordage applications, presenting it as one of many wild fibers that can be harvested from the land to make snares and nets, to build shelters in a survival situation and to tie gear. Jason Drevenak uses it for what he calls
“business cordage.” He makes bow strings that he claims sustain up to 35 pounds of force. Jeff Gottlieb uses it for cordage and large nets. Tom Brown III uses dogbane cordage for everything from bow strings to fish line and says he has caught many a large fish on them. Bill Kaczor has used it for fish nets, cordage, baskets/bags, snares and bow strings. Others are examining dogbane’s basketry applications.

There are two types of cordage: reverse wrap and thigh-spun. Most practitioners make a 2-ply, reverse wrap cordage. This type of cordage is quite easy to learn and make and allows for great control in the twist of the cord as it is made one twist at a time. Appendix xxvii offers samples of personal reverse wrap cordage made by the author of this study, as well as some donated for this study by Jeff Gottlieb.

![Bow Drill Cord](image1)

![Nålbound Bag](image2)

![Yarn Made on Spindle, Courtesy of Roots School](image3)

![Twined Basket, Courtesy of Roots School](image4)

**Figure 3: Modern Examples of Dogbane Products**
Figure 3 shows modern examples of dogbane products. Bill Oliphant routinely makes strings for bow drills out of dogbane. One of his bow drill cords can be found in Appendix xxix. Also a hand spinner and weaver, Mr. Oliphant decided to use nålbinding to make a bag of his reverse wrap cordage. Sarah at Roots School spins her dogbane on a spindle to make twined baskets. Most uniquely, Velma Bolyard makes paper with dogbane seed. A sample can be found in Appendix xxix. She hopes to begin using the bast fibers in paper production soon. While most people make reverse wrap cordage, another method is thigh spinning. Thigh spinning takes some time to master, however, once mastered, one can spin a larger amount of cordage in a shorter amount of time. Alice Tulluch made a beautiful split-ply woven tumpine of dogbane, in addition to a woven twined basket, using cordage for the warp and unspun dogbane fibers for the twining.

MATERIALS AND METHODS

This study's purpose is to determine the most appropriate way for a modern spinner to harvest, process and spin this ancient fiber. Through interviewing people who still use this fiber and researching the historical, anthropological and ethnobotany of this plant, the author finds consensus on how and when to harvest the plant for fiber, as well as how to remove the fibers from the stems. Any information on fiber preparation that may have happened once the fibers were removed from stems (such as combing) has been lost to history. Also important to note, most of the knowledge the author gleaned about using this fiber results from in-person or email interviews with people who are harvesting and using dogbane today. Responsibility for error in representing or transferring said information lies with the author, who took this information, applied it to her knowledge of processing flax and attempted to merge the two.
Tools Used

- Cross cut clippers and several sharp knives: harvesting the stalks
- St. Blaise 2 pitch wool combs: hackles
- Nit combs: fine combs for further process of line fibers
- Standard wool hand cards: carding tow fibers
- Louët S10 double treadle spinning wheel: spinning all fibers, except where hand spun cordage is noted
- US size 1 & 2 knitting needles: knit swatches
- US size E crochet hook: crochet swatches
- Purl & Loop Swatch Maker Weaving Loom (3 in 1): woven samples
- Steam Iron: used to press all end use samples.

Harvesting

Dogbane is collected in the fall after its milky sap leaves the stems and returns into its roots for winter. The optimal length of time to start harvesting after first frost is up for debate and was likely determined by climate and site location. Alice Tulluch, primitive skills practitioner from northern California, always picks her dogbane the day after the last frost and gathers as much as she can at that time for use later in the year. She picks her stalks when they are still “wet” or willowy. Bill Oliphant of Arizona asserts one must wait “until it has been snowed on at least once” before collection. Jason Drevenak, from West Virginia, offers the clearest description of when to harvest: he waits until he sees the leaves start to fall off the plants, and the seed pods change and tighten. He says that, by late September, the plants are dry – they have died off and are ready to be cut. He cuts them about an inch from the ground. Sarah Corrigan from Vermont harvests in the fall when dry. Tom Brown III of Portland, Oregon harvests in the late fall or early winter after it has died back.
maintains that, once the fiber is wet for prolonged periods, the fibers rot, especially if under snow. Jeff Gottlieb has harvested from New York, Virginia, Pennsylvania and North Carolina and always cuts it in the fall after it dies back.

In the area this study took place, the year’s dogbane stopped being willowy and was dry enough to harvest several weeks after first frost. This indicates that expedient harvesting depends upon the climate of the area. It suggests that early natives likely scheduled periods of time during which they traveled through the dogbane habitat areas and harvested the stalks accordingly.

Schlick (1994) says that the time of harvesting the stalks can determine the color of the dogbane. The red-brown color darkens the later one waits. “Cutting time was based more on the custom of the family than on the desire for a specific color. One Yakima family reported they cut it after the rains began, but ‘before the little people got it’” (Schlick, 1994, p. 35). When comparing samples used in this study, the color of the 2016 harvest, which sat in the field for a year, appears significantly more red than that of the 2017 harvest, picked just after first frost.

Several people interviewed during this study advised never to use fiber that has sat through winter, as it degrades quickly and will no longer be of use. Other people reported they use the old fiber until the following fall, when new fiber becomes available. Again, these experiences vary by region. In the Four Corners of the United States, where this study occurred, the climate is arid, and snow does not last for more than a few days. Both Bill Oliphant (Arizona) and James Turner (Four Corners) like to wait for dogbane to sit through one winter, to be picked in the spring. This study used two primary samples: 2016 dogbane that weathered in the field for a year before harvesting in the fall of 2017 (2016 Field in the samples) and 2017 dogbane, picked in October and November of 2017.
Two sources pick their dogbane and allow it to cure, out of the elements, for at least a year before use. Alice Tulluch picks her dogbane still wet or willowy, so waiting a full year for drying and curing makes sense. Sarah Corrigan believes dogbane that rests for a year sheds its bark more easily than freshly picked stalks. Verifying the veracity of this statement was outside the limitations of this study, but it does seem logical that dry bark would be easier to remove.

**Processing**

Few written historical descriptions of dogbane's fiber processing exist. The study's author found two ethnographies and a handbook written for the Royal British Columbia Museum that offers in-depth discussion on how dogbane fibers were removed and used. The oldest of these texts is written by Turner in 1947. Her book, *Plants in British Columbia Indian Technology*, is mostly a historical work detailing wherever possible the skills used in relationship to the plants.

Wheat's book *The Survival Arts of the Paiutes*, written in 1967, tries to capture skills the author felt were going to be lost. The work features members of the Great Basin tribes, demonstrating traditional skills they learned from their ancestors and goes to great pains to document each skill. Schlick's (1994) *Columbia River Basketry* is both history and ethnography of the descendants of the Columbia River weavers.

Modern practitioners process dogbane similarly to nettles collected in the wild and loosely resembling how flax and hemp are processed. The tradition of flax and hemp dates back thousands of years. Both flax and hemp are harvested wet and then allowed to ret, a process that softens the outer bark on the stalks. Little evidence on ancient practices for dogbane processing exists today.
It is very likely that many prehistoric people in the Southwest bypassed this rather elaborate processing sequence, stripping their fibers from recently dead plants using simple stone scraping tools that would survive archaeologically but would resemble those used for many other purposes...However it is accomplished, the processing of bast fibers produces individual fiber bundles of different lengths. The longer fiber produces the strongest and smoothest yarns, while the shorter ones yield strong but relatively coarse yarns. (Teague, 1998, p. 15)

Interviews with primitive skills practitioners across the nation reveal that dogbane is broken and the fibers removed in basically the same manner, noting a few regional differences.

Dogbane is usually collected once it is dry. No real correlation to the “retting” process used in both flax and hemp production exists, although Schlick (1994) describes several ways in which weavers stored the stems once they were cut. “One kept the stems under her mattress to cure them, another hung them in a shed, another buried them in the ground or simply left them outside” (Schlick, 1994, p. 35). Several practitioners reported that they store cut stems in their rafters or attic once cut. One hangs them upside down. This author kept a bundle in the garage.

It is important to understand that cut stalks can be stored indefinitely out of the elements, and the fiber will be usable for many years. Several people spoke of stalks that had been cut more than ten years ago that were still usable. Turner describes the following procedure used by the Okanagan.

The stems were harvested in September or October just as the leaves were turning yellow...The branches and leaves were removed, and the stems were flattened by pulling them over a pole tied to a tree. They were then split open from bottom to top.
with a knife or a sharp stick. The outer skin or “bark” was peeled off by hand and the inner fibrous parts were bundled together and hung by the tops to dry in the wind. When dry, the stems became brittle and the pithy middle tissue was separated from the fiber by pounding the flattened pieces with a stick or twisting them with the hands. (Turner, 1947, p. 169)

Interestingly, this description suggests the Okanagan harvested their stalks when they were still willowy – hence, allowing them to dry in the wind.

The above example is not the most common method discovered by this author. Like flax and hemp, dogbane stalks are broken. More commonly, stalks of dry dogbane are crushed lengthwise, usually by collapsing the stems between the thumb and forefinger along the length, then turning the stalk a quarter turn and crushing once again to get four long sections. The author struggled with this method, lacking the thumb strength necessary to collapse some of the larger stems. As a result, pliers were employed, while it was suggested that walking on the stem to break them evenly may have been successful. Natives used their teeth. It seems any of these methods could work.

Once broken lengthwise, the sections are gently separated into four parts, although this author has started just pulling them in two parts that are only marginally attached. Figure 4 shows the process. Starting at one end, the pith is broken, and the fibers are removed from the outside of the stalk. If done successfully, they come off in a long ribbon. One can see the coating on the fibers that keep them intact, making them appear like a curly ribbon. This method is described by most skills practitioners and is also the method recorded by both Schlick (1994) and Wheat (1967).
The scutching process, a vital step, is accomplished by either scraping the stalks before breaking then removing the fibers or by rubbing (sometimes referred to as “buffing”) the fibers between the hands once the fiber has been removed. The fibers’ coating renders them difficult to work with and prevents drafting. Wheat (1967) says that the stalk was scraped with a knife (before pulling the fibers from the stalk) and, in the past, an obsidian crescent was used to remove the red bark. Schlick (1994) describes a scutching process once the fibers were pulled from the inner pith.
To obtain the smooth inner fibers of the bark, the weaver and her helpers pulled the bark strands across a piece of flint, a rabbit rib, or some other smooth sharp object. Fragments of the outside skin would fall away, leaving the long, strong and silky strands they desired. (Schlick, 1994, p. 36)

Both scraping and rubbing the fibers were used on the 2016 sample to determine the better preparation. Scraped samples underwent the strokes of a sharp knife to remove the stalks' coating, a time-consuming, messy process that produces significant dust. It is advisable to conduct this procedure out of doors. Several people expressed concern that scraping would damage or weaken the fibers, but it is the preferred method for most practitioners on the West Coast.

The second method is to rub the fibers between the hands following removal from the stalk. This author removed the ribbons, collecting them until a large bundle accumulated and rubbing the bundle between the hands. A larger bundle facilitated flaking off the outer coating. Applying either lotion on the hands or wearing gardening gloves increased the friction and made the rubbing of fibers easier. This step is also best accomplished outside or in an area where debris can be easily collected. Further study may explore using a flax scutch for the process.

Scraped Stalk  Rubbing Fibers

FIGURE 5: SCUTCHING METHODS
After breaking and scutching, the fibers need to be hackled. Only anecdotal evidence suggests native tribes hackled the fibers. One interviewee described watching one of her native teachers separate the fibers using a bone awl. Sarah Corrigan combs her fibers with a bone comb. Absent a North American Native equivalent, this author hackled both scraped and rubbed samples with St. Blaise 2 pitch combs, collecting and saving waste or tow fibers for use in both samples. Coating that required removal remained after hackling on the wool combs, so a nit comb for lice was employed to further process the line fibers, collecting waste as tow. The resulting line fibers from both samples were indistinguishable from each other. After processing using both methods, the author finds no reason to scrape the stems before use unless one plans to process only a handful of stalks for use in cordage. These samples can be found in Appendix iii. If one is continuing the process for spinning a large project, the time and mess involved in scraping each stalk seems unnecessary. It was determined that all further fibers in this study would be processed by rubbing the fibers removed from the stalk before hackling.

The process of hackling the scraped and rubbed fibers produced a large quantity of tow fibers with an average staple approximately four inches long. Some parts measured even longer. Due to staple length, these fibers were carded on hand cards into carded sliver. All tow fibers in this study were prepared in this manner.

**Spinning**

All yarns spun for this study, except samples of reverse wrap cordage, were spun and, where applicable, plied on a Loïet S10 wheel at a ratio of 7.5:1. The author favors the strong uptake of her bobbin-led wheel when spinning all kinds of bast fibers. All the fibers in this study were spun using a worsted spinning technique – in most cases, short backward draw.
The spinning section of this study begins by considering just the tow fibers. The first amount of tow fiber available after processing yielded roughly twice as much as the line that was produced, allowing the author an opportunity to experiment widely on samples made from tow fibers and to extrapolate that information later when working with the prized line fiber.

The first decision this study considered was whether to spin the fibers wet or dry, as anthropological evidence does not offer an answer. Using the 2016 field fiber, the author first experimented with wet versus dry spinning. While both Schlick (1994) and Wheat (1967) describe the process of thigh spinning the fibers, neither mention using water to dampen the fibers. Alice Tulluch used a small cup of water to wet the fibers to demonstrate thigh spinning with dogbane. Gaustad (2014) advises spinning flax wet, as its fiber is stronger when wet, and claims it makes a smoother, more lustrous yarn. "Hemp is stronger when wet, but because it has no pectin, it won’t spin smooth with moisture. Still, you may find that wetting it helps when you’re spinning a fine yarn” (Gaustad, 2014, p. 106). The author has no real way of knowing if the dogbane fibers contain pectin or not. Sarah Corrigan and several other practitioners assert spinning dogbane when wet can produce a better yarn. Jeff Gottlieb "like[s] to finger-twist dry dogbane fibers and thigh-roll wet fibers” (Gottlieb, 2013, p. 52).

To determine whether to wet or dry spin, the author experimented by spinning and plying half the 2016 field fiber samples wet and half dry, finding that, while it is possible to spin dogbane dry, it tends to separate and break more easily. Spun wet, it was easier to add fibers to the drafting, resulting in a more even yarn. As a nice bonus, when spun and plied wet, the fibers tend to set their twist while drying after being wound off onto a skein winder. Also, the dry spun samples seem to be fuzzier than the wet spun. The sample yarns from this experiment can be found in Appendices iv & v. From this point forward, all samples were spun and plied wet.
Twist direction is an important question to consider in a bast fiber discussion. Flax is generally spun in the S (counter clockwise) direction and plied in the Z (clockwise) direction, due to the natural S curve of the flax fiber. Heinrich argues in her Spin Off publication that one can spin flax in either direction. “Most of the ancient Egyptian linens were S-twist – The inevitable outcome when a right-handed person propels a spindle down the thigh toward the knee. On the other hand, the linen textiles documented in All Sorts of Good Sufficient Cloth were entirely of Z-twist yarns. Industrially prepared singles linen yarns are also Z-spun” (Heinrich, 2018). When thigh spinning, fibers are spun in S down the leg and plied in Z when rolling them back up the leg. If one is making reverse wrap finger cordage, fibers are twisted in Z and then plied back in S.

Does the direction of the twist matter? Does a “best” direction exist? The following experiment was performed to determine the answer. One batch of carded tow fibers from 2017 was spun in an ssZ direction, and another batch was spun in a zzS direction, both at a 7.5:1 ratio. The end TPI for both skeins is between 4-4.5 with a WPI of 15-16. Examining the sample skeins in Appendix vi shows little difference between the two. After many discussions with different fiber artists, including spinners, weavers, basket makers, knitters and crocheters, this author concludes that end use could play an important role in the direction of twist. Spinners should consider end use before spinning when possible, and to create an experiment that truly shows end use of these yarns, they were all scoured before use. The recipe for scouring appears in the following section of finishing techniques.

Each of the samples – woven, knit and crochet – incorporate yarns of both twist directions into the same swatch. A blue line demarcates twist direction. The woven sample was created with 2” of the warp wound with ssZ yarn and 2” of the warp wound with zzS yarn. The first 2” of the weft was woven with ssZ yarn and the second 2” of the weft with zzS yarn, creating a grid where one can see all variations of the twist in a woven form next to each other. The knit sample uses stockinette stitch. The swatches alternate 1” stripes between zzS and ssZ. The crochet sample also alternates stripes of single crochet between
zzS and ssZ yarns. The blue yarn in all samples, showing twist direction changes, is a 2-ply hemp yarn that was spun zzS.

In the woven sample found in Appendix vii, the author detects no difference in the weaving, based on the direction of the twist. It had been suggested that the sections with an opposite twist for the warp and weft (ssZ to zzS and vice versa) would lie flatter; however, no distinct difference in the way the fabric lies has been detected.

In the knit piece in Appendix viii, the stitches have a different slant to them in the separate sections. However, if a full piece were knit in either, nothing would distinguish one direction from another.

The author suspected that the crochet sample in Appendix ix would give the most insight into this matter, as crocheting with a yarn with a zzS twist tends to untwist as one makes stitches. While the author confirmed this theory in other samples crocheted for this book, these two samples behaved the same when crocheted in both types of twist, and the end samples betray no difference. It is the author’s determination that no observable difference appears in the finished piece, based on twist direction in any of the samples. Since twining techniques or nålbinding fall outside the scope of this study, no conclusive information on how twist would behave in either of those situations is offered.

Fiber from the 2016 field sample tow was wet spun as a 2-ply yarn in zzS, left to dry on the niddy-noddy and was otherwise unfinished. The resulting yarn has a WPI of 13, a TPI of 3, a 20° angle and weighs 5.9g and is 2/5 lea. These samples can be found in Appendix x. Swatches found in Appendices xi-xii, include knitting, crochet and weaving are slightly stiff, due to the unfinished fibers, but have a nice hand otherwise. The unfinished yarn sheds quite a bit of debris as one works.
What about singles instead of a 2-ply yarn? The 2017 tow fiber was spun as singles in both Z and S directions. The singles were spun wet, soaked in a water bath and left to dry on a skein winder to set the twist. These yarns are otherwise unfinished. The Z twist single has a TPI of 3 measured on a ply back, a WPI of 22, an angle of 30°, weighs 3.6g and is 4 lea. The S twist single has a TPI of 3 measured on plyback, a WPI of 22, an angle of 30°, weighs 3.6g and is 4 lea. Samples of these yarns can be found in Appendix xiv.

Working with these swatches revealed the tow singles were too fragile to warp the sampler loom; therefore, only knit and crochet swatches of the tow fiber singles appear in this study. A significant amount of debris fell off while making these swatches, which have a softer hand than the 2-ply swatches. The finished knit swatches in Appendix xv are very fuzzy, reminiscent of something that has been felted. Knitting with a singles always results in a finished swatch that cants in the direction of the twist. To counteract that, the finished swatches were soaked in a basin of water, wrung dry and pinned into squares. The energy of the twist seemed to make no difference in the crochet samples in Appendix xvi, although the author found that, in both the knit and crochet samples, the yarn tended to be fragile and broke several times. Ripping out stitches must be done with care.

Line fiber differs from tow fiber in that it is longer. In this study, line fiber ranged from 12 to 18 inches or longer. Overall, less chaff or little bits of the bark falls off the line fiber, but some debris is present. A spinner can employ one of multiple methods when spinning line fiber: for example, dressing a distaff with the fiber and spinning from there or wrapping the fibers in a towel for control and spinning from the end of the bundle. Of those two methods, the author prefers to spin all bast fibers from a towel over spinning from a distaff. Given the author’s familiarity and success with the towel method, it was the method used to spin all line fiber in this study. The fibers were spun worsted, short forward or short backward draw. All fibers were wet spun and, where applicable, plied wet. Unfinished 2-ply line yarn had a TPI between 3 and 3.5, a WPI of 12 and an angle of 20°. The yarn weighs 4.8g and is 2/6 lea. The sample can be found in Appendix x.
Swatches of the unfinished 2-ply line yarn can be found in Appendix xi-xiii. The unfinished yarn is quite coarse. Most people who feel it find that it resembles burlap or jute. It is also similar to unfinished linen. The unfinished yarn used for knit, crochet and woven samples shed large quantities of the bark that was still clinging to the fibers. The 2-ply swatches have nice stitch definition and, as with all the 2-ply yarns sampled in this study, was relatively easy to work with as a medium. Other than the yarn’s natural stiffness and coarseness, no issues arose while working with the 2-ply line yarn.

The singles made from line fiber, however, presented some challenges. It is fuzzy, like mohair. While stronger than the tow single, it is still not as sturdy as the 2-ply samples. The singles has a TPI of 4 measured on a ply back, a WPI of 20 and an angle of 10°. The yarn weighs 3g and is 5 lea. The sample of this singles can be found in Appendix xvii. The author successfully knit and crocheted with the singles, creating swatches that were similar to corresponding tow swatches, which can be found in Appendix xix. Sturdy enough to warp the sampler loom, all the little hairs started to catch as soon as weaving commenced. Gaustad (2014) talks about abrasion resistance in yarn with either the warp or the weft, which occurred throughout the course of this study. On several occasions, the weft yarn developed pills that not only impeded weaving but also caused the weft yarn to fray and break. Overall, the process of weaving with these singles was rife with frustration. The woven swatch can be found in Appendix xvii.

**Finishing**

Following the yarn’s spinning and plying, one must decide its optimal finish and end use. Again, early native peoples left no documented practices for finishing dogbane yarns before weaving or twining, but a ready knowledge of flax and hemp allows reasonable assumptions to be made. Both flax and hemp are boiled or scoured and even pounded (beetling) to soften them for use as textiles. “Freshly spun, they are wiry and stiff, but when washed and boiled, linen and hemp become much softer. After they’re manipulated and beetled, they soften even more” (Gaustad, 2014, p. 137).
This study used yarn from the 2016 field zzS tow samples in this portion of experimentation. Half the yarn was boiled in plain water for an hour. The other half was scoured in 2 tablespoons of washing soda and 2 tablespoons of dish soap for an hour and then rinsed. After the yarns dried, the twist appeared to have loosened somewhat, so the yarns were sent back through for more ply twist. The skeins were then soaked in water and hung to dry to reset the twist. Appendix xx contains these yarns.

Because the scoured and boiled yarns came from the same skein as the unfinished yarn, they share the same WPI, TPI and angle as the unfinished yarn. The boiled yarn weighed 5.5g and is 2/5 lea; the scoured yarn weighs 5.0g and is 2/6 lea. As previously noted, the unfinished skein weighs 5.9g. Since all the skeins were wound from the same original skein, it is obvious that scouring removes the most debris and other substances from the yarn. End-use samples were knit, crocheted and woven with the yarns and can be found in Appendices xxi-xxiii.

The yarn that was boiled is a bit softer than the unfinished yarn and still has some of the little bits of bark falling off it as it is worked. Its color has changed to appear more red, and the yarn itself shows a bit more shine than the unfinished yarn. The end-use samples are softer as well, particularly the knit sample.

The scoured samples are the softest and shiniest of the yarns and has, in the author's opinion, the best potential for textile applications. The color is still more red than the unfinished yarn, but it is lighter than the boiled yarn. It also retains the luster of the boiled yarn. Best of all, there were almost no flakes of bark that came off the yarn while working with it.
Sizing

Working on swatches with the line singles became problematic, particularly when encountering the abrasion on the yarn while weaving. Gaustad offers sizing as a method for smoothing yarns for weaving. Since fuzziness created such an abrasion challenge, the author opted to try sizing. A single was spun in the S direction and then scoured for an hour, before treatment with a runny gelatin solution.

- 2T unflavored gelatin
- ¼ cup cold water
- 1 cup boiling water
- ¾ cup cold water

Soak gelatin in cold water until it swells. Stir in boiling water until gelatin dissolves. Add cold water and stir. (Gaustad, 2014, p. 146)

The above sizing solution was placed in a flax plying bowl. The singles were pulled from a swift through the hole in the plying bowl and onto a PVC niddy-noddy. After winding, the skein transferred back to the swift for drying. The singles tended to stick to one another after they were dry, so care does need to be used when winding off the swift.

Once sized and allowed to dry, the S spun singles measured 28 WPI. It was 4 TPI based on a ply back on the wheel, weighs 2.6g for 10 yards, has an angle of 20° and is 6 lea. The difference between the sized singles and unsized singles was remarkable. While the sample loom could be warped with unsized singles, the correct set could not be achieved, as the yarn was simply too fuzzy to fit through the holes for the 10 or 12 set without disintegrating. The sized singles threaded through the smallest holes in the loom for the 12 set. Very stiff, they work a bit like soft wire. A beginning weaver, this author was not able to pack the yarn very tightly on the woven swatch with the sized singles. The author had no
issues with breakage due to abrasion or other issues from the fuzziness of the single. The author suggests that, if the spinner wants to use a dogbane single, he considers sizing in order to facilitate stabilization during the weaving process. A sample of this yarn and the woven swatch can be found in Appendix xxiv.

**Beetling**

Beetling is a method used to finish flax. Baines (1989) calls a beetle “an implement used to beat linen, in particular to bring out the natural lustre” (p. 189). This process can be used to soften skeins of yarn after scouring or once the yarn has been woven. In both cases, the yarn or finished object is worked while damp. If one is beetling yarn to foster a more supple hand for knitting, the skein should be moistened. “Lay the hank on a hard-wooden board and use a wooden mallet... Try to beat an even amount all over. Test by feel and re-beat any sections that still feel hard. When finished, it should have become somewhat softer and also look more lustrous” (Baines, 1989, p. 72).

Using a skein of the 2017 tow fiber that had been scoured for the twist direction experiment, the author moistened and beat the yarn. Lacking access to a wooden board, the author employed granite countertops, trying both a wooden mallet and a rubber dead blow mallet. The rubber mallet became the tool of choice, and the resulting yarn is considerably softer than any of the previous samples in this study. The swatch knit from the beetled yarn has a beautiful luster and a nice hand and is, by far, the most wearable swatch developed in this study. Since most knitters and crocheters want to use a finished yarn, one should consider beetling the yarn prior to knitting or crocheting, in order to give the end product a softer finish and drape. Appendix xxv contains both the yarn and knit swatch.

Sometimes flax is not scoured before weaving, requiring all finishing to be done after the cloth is removed from the loom. If the yarns have been sized, the sizing must be washed from the cloth by soaking it in warm water until the slimy feel dissipates, after which the
piece mush be washed in soap and hot water and rinsed several times. Excess water is squeezed from the fabric before beetling. “The final stage of finishing linen is to flatten the yarns and close them together to produce a smooth surface and bring up the natural luster of the fiber...The more familiar way of finishing linen was done by women placing the cloth on a large flat stone beside the river and beating it with a wooden club known as a ‘beetle’” (Baines, 1989, p. 161).

Woven swatches used the 2016 field 2-ply line yarn, spun zZS and left unfinished and without sizing. First the swatches were scoured for an hour (employing the previously recorded method), rinsed and dried. The water in the scouring pot resembled strong black coffee. One swatch was removed, and the rest were scoured for a second time for an hour, rinsed and dried. The scouring water was dark again, although not as dark as the first time – it looked more like a strong black tea. One was removed, and the final swatch was scoured a third time. The water in the third scouring looked like a weak coffee or tea solution.

Thoroughly rinsing the scouring agents from both swatches and yarns proved arduous, as total soap removal requires significant rinsing. By the third scouring, the yarn’s integrity seemed to be breaking down slightly. After the third scouring, the last swatches were beetled, which helped flatten the yarn and close gaps in the weaving. Beetling also brought out more of the fiber’s luster. Finally, and most importantly, beetling changed the hand of the weaving significantly – it was no longer coarse and scratchy. Instead, it became soft, supple and something one would wear against the skin. All three of these swatches can be found in *Appendices xxvi-xxvii*.

It is this author’s determination that beetling is an important step in finishing both yarn and woven cloth when using dogbane. It brings out the luster of the fibers, softens them and yields a softer hand, which is especially important if the spinner wants to use dogbane...
in a textile application that creates a piece of clothing. It would matter less if one were making a bag, net or other non-wearable textile.

**Conclusion**

Is dogbane a viable fiber for the modern fiber artist and, if so, which method is optimal for harvesting, preparing, spinning and finishing? Clearly, many native groups across North America prized dogbane with good reason. Absent fibers such as flax or hemp to spin, dogbane fiber has much to offer. It is strong and durable, insect-repellent in finished objects and renewable. Because it grows from a rhizome, it comes back every year, and cutting an entire field makes it come back straighter and stronger than the year before.

Dogbane can be found along drainage ditches, in riparian areas and along streams. The modern fiber artist should harvest dogbane in the fall, after first frost, when the leaves start to fall off the plants and the stalks dry. This time frame varies by region. Dogbane should be cut about an inch above the ground with pruning shears or a sharp knife. Once the dogbane stalks are cut and the branches removed from the main stalk, the fibers can be removed immediately from the stalk, or the stalks can be stored out of wet weather for an indeterminate amount of time.

The best method for removing fibers from the stalks and bark from the outside of the fibers is breaking the fibers lengthwise and pulling the stems apart, breaking the pith every two inches and removing it carefully from the fibers as described previously. Once enough ribbons are removed to form a small bundle (10-15 stalks’ worth), those fibers should be rubbed between the hands to remove the outer bark. A flax scutch could be an interesting tool to try in bark removal.
This author found that hackling the rubbed fibers on wool combs worked well and surmises that flax hackles may work even better for this method. The tow fibers should be kept and carded into sliver on standard wool handcards. The line fiber can be further worked with smaller combs or nit combs.

The tow fiber should be spun wet using a worsted method. Using tow singles is not recommended. Use of a flax plying bowl is advised to facilitate wet plying tow singles together. The wet yarn can then be wound onto a niddy-noddy and allowed to dry to set the twist. If the spinner wishes a softer, finer yarn, scouring the yarn in a solution of washing soda and dish soap is recommended. Yarn from tow was found to be suitable in a wide variety of textiles, including knitting, crochet and weaving.

Line fiber is spun in a worsted manner. This author found that using a towel to control the fibers worked best. A distaff might also be an option for those spinners who are accustomed to using one. Like tow fiber, line fiber is best spun wet. Line singles can be used, but it is recommended that they be treated with a sizing prior to weaving. When plying line singles into a 2-ply yarn, a flax plying bowl is recommended. The wet yarn should be placed on a niddy-noddy to dry and set the twist. For a softer textile, scouring the yarn is recommended. Yarn made from line fibers is suitable for a wide range of textile uses, including knitting, crochet and weaving.

Spinning direction does not seem to be a factor in spinning dogbane. The spinner will want to keep the end use in mind when determining the direction in which to spin and ply the yarn. Some end uses may lend themselves to different twist directions.

Sizing is important when weaving with singles. It strengthens the yarn and reduces abrasion while weaving. Beetling the yarn should be used when the finished textile is to be
knit or crochet for clothing. When the yarn is woven into a fabric for clothing, it should be scoured and beetled after removal from the loom.

There are some items that were not covered in this study that would be good options for further study. The first would be using actual flax processing materials. Using a true break, scutch, and shorter flax hackles might help significantly in the processing of this fiber. The author did not explore carding tow fibers into rolags instead of sliver, nor did she explore woolen spinning of this fiber. The dyeability of this fiber was not explored at all in this study. Finally, it would also be interesting to find out if waiting a year after picking fibers does make the removal of the outer bark easier.

Is dogbane worth the work involved to get to a finished product? This author answers in a resounding affirmative. If a source is available in the area, it is a worthwhile endeavor to harvest some and see what can be made. The red hue of the finished yarn makes a striking change from flax and hemp, not to mention the fact that working with dogbane brings one just a bit closer to the nature of the native peoples of this continent.
References


Turner, J. (2017, August 8). Interview.
Dogbane Stalks

2016

2017
Fibers Pulled – Rubbed after removal from Stalk

Fibers pulled – From Scrapped Stalk

Fibers Pulled – No prep work

2016 Field Stalk - Scraped
Scraped Fibers

Rubbed Fibers

Line

Tow

Tow - Carded Sliver
Dry vs Wet Spinning Tow Fibers
Dry vs. Wet Spinning Line Fibers

[Images of dry and wet spun fibers with labels and measurements]
Twist Direction – Swatch

Woven
Twist Direction – Swatch

Knit

- ssZ
- zzS
- ssZ
- zzS
Twist Direction – Swatch

Crochet

ssZ
zzS
ssZ
zzS
Unfinished 2-Ply Yarn

Tow & Line
Unfinished Swatches Woven
Unfinished Swatches Knit
Unfinished Swatches Crochet
Unfinished Tow Singles Yarn

S

Z

Hand Carded - Wet Spun
3 TPI, 2 WPI, Angle 30°

Hand Spun
3 TPI, 10 yards

Single S singles
2017 Tow

Dogbane

Unfinished

Single S singles

Hand Carded Skirt

3 TPI on plectrum
3.39, 5.1

Hung

4gg

Hand Spun

Sara McCourt

Dogbane

Sara McCourt
Unfinished Tow Singles Swatches

Knit
Unfinished Tow Single Swatches

Crochet
Unfinished Singles Yarn - Line
Unfinished Line Singles Swatch

Woven
Unfinished Line Singles Swatches

Knit and Crochet
Finishing Techniques Yarn Samples

Boiled & Scoured
Finishing Techniques Swatches

Woven

Boiled

Scoured
Finishing Techniques Swatches

- Knit
- Boiled
- Scoured
Finishing Techniques Swatches

Crochet

Boiled

Scoured
“S” Spun Line Single – Sized
Yarn & Woven Swatch
Beetling

2-ply Tow Yarn
Beetling Woven Swatches

1st Scour

2nd Scour
Beetling Woven Swatches
Reverse Wrap Cordage

Reverse wrap Cordage made by Jeff Gottlieb

Reverse wrap Cordage made by Sara McCourt
Reverse Wrap Bow Drill String

made by Bill Oliphant

Paper Made from Dogbane Seed

Made by Velma Bolyard