Future Generations University

Adding Farm Value to Appalachia's Riparian Buffers with Stinging Nettle

Future Generations University Team

Sarah Collins-Simmons

M. Joey Aloi, PhD

Evelyn Hartman

Silver Run Forest Farm Team

Jonathan McRay

Cornelius Deppe

March 2024

Publication made possible by a grant from the U.S. Department of Agriculture (USDA), Forest Service, National Agroforestry Center, under the authority of the Cooperative Forestry Assistance Act of 1978.

Introduction

Stinging nettle (*Urtica dioica spp. dioica* and *Urtica dioica spp. gracilis*) is most notable for the stinging and itching sensation caused by skin contact with the plant's tiny spines along the stem and on the underside of the leaves (see Figure 1). Yet stinging nettle is a remarkably versatile and useful plant, which can be an important part of any small farm's viability strategy. It can be harvested and processed for culinary, medicinal, and fiber products, and sold fresh, dried, or as part of value-added products. Safe handling practices and processing of the plant enables agriculturalists to reconsider the disliked and burdensome weed and treat it as an herbaceous perennial with market potential. This primer serves as a first step in actualizing the economic potential of nettles.

Figure 1 - Hair-like spines of the stems of stinging nettle. (Photo credit: Doug Goldman, USDA PLANTS 2023)

Enterprise Planning and Land Management

Sustainable land management is a key component to developing a successful nature-based enterprise. Before investing in a new enterprise, working with a registered forester to develop a management plan is an advisable first step. At the very least, landowners need to be familiar with the manner in which nettle patches can spread quickly and uncontrollably before introducing them to their riparian areas. Giving a little more time to the planning phase of this crop and visiting neighbors who cultivate nettle will save countless management hours once the crop has been introduced.

The type of production site(s) selected for cultivating stinging nettle will indicate which land management practices to implement to best benefit the crop. When nettles are grown in a riparian buffer, they play a critical ecosystem support role by serving as an understory plant that can thrive in moist soils and tolerate flooding. The fibrous roots of nettle hold streambank soils in place and the vegetative plant parts and root structure can help protect other small seedlings during flood events.

Plant Culture

Cultivation and Propagation

Lifecyle

Plants flower in late spring or early summer. Flowers are unisexual; a single flower only has male parts (stamens) or female parts (pistils) rather than both. Seeds mature in late August or early September. The achene fruits remain on the plant until frost. An achene is one-seeded, dry fruit type that is often mistaken for the seed itself, which is actually found inside the husk or papery skin.

Direct Seeding

For direct seeding in the spring, plant seeds in a dense layer on the surface of moist soils, press lightly into the soil or cover lightly with a very thin layer of soil for partial shade. Seeds should germinate in approximately 14 days. Thin the seedlings, if needed.

Propagating Transplants

To start transplants by seed in a greenhouse environment, seed flats in late winter. Seeds should germinate in approximately 14 days. Transplant in early spring.

Vegetative Division

Stinging nettle is considered a weed by many agriculturalists due to its ability to spread vigorously and create new colonies. The species survives most notably through vegetative reproduction by rhizomes. Plants established by seed in test situations initiate vegetative spread in the first growing season (Bassett et al 1977). A rhizome planted in the later summer can spread up to four feet in all directions by the following year.

Dig up transplants in late fall. Perennials like nettle prefer to be established while dormant in colder months. As soon as possible, whether the rhizomes are field harvested or purchased, 1) rehydrate rhizomes, 2) divide (optional), 3) pot up or plant out, 4) cover lightly with soil, 5) water in, 6) cover with mulch (optional). Space vegetative transplants or seedlings eight inches apart.

Figure 2 - Stinging nettle growing in partial sun in a natural setting. (Photo credit Sheri Hagwood, USDA PLANTS 2023)

Care

Sunlight
Grow nettles in full sun to partial shade for the greatest yield.

Disease
Research on the production or management of stinging nettle in North America neglects to include information on plant disease or disease prevention. Nettle is a robust plant with few diseases of economic importance.

Soil Requirements
For optimal production, research suggests that stinging nettle thrives in riparian areas, the edges of moist forest communities, and disturbed soils (Mitich 1992, DeArmond and Janke 2004). Nettle will often spread to suboptimal soils.

Hydration
Nettles thrive best in moist and fertile soils. Maintain moist soils during harvest season. Dry soils can reduce the plants depth of flavor and may potentially reduce its medicinal potency (Buckner 2023).

Soil Composition
Grow nettles in soil with high organic content (4 to 5 percent), with a soil pH in the range of 5.0 – 8.0.

Nutrient Management
Mulch once a year in the winter when the plants are dormant. This adds to the soil fertility and maintains moisture.

Pest/Weed Management
Weeds
Stinging nettle becomes the dominant planting in disturbed soils. Grasses are known to be the principal competitor. Other than grasses, there are few weeds that need to be managed. Nettle itself, however, can often become a weed in other parts of the farm. When intentionally growing nettles in a riparian area for the ecosystem services as well as a revenue source, carefully consider the planting locations. Select locations that can naturally prevent stinging nettles from spreading to undesired locations, such as a spot with existing rock creating at least one hard edge in the riparian zone. Additionally, cut the flowering seed heads in the fall to reduce the spread of the patch.

Pests
Caterpillars may present as a potential pest but do not cause plant mortality. With their vigorous growth habit, nettles rarely require pest management.

Predation
The plant has little to no predators. In fact, it can often deter predators from other crops or farm areas. When grown in proximity to other crops such as fruit and nut trees or shrubs, stinging nettle can prevent predation pressure on these other crops.

Harvest and Processing

Harvest

After approximately 80 to 90 days of seasonal growth, nettle vegetation is matured for harvest. Wear clean gloves, pants, and closed-toe shoes when harvesting. It is recommended to wear a long sleeve shirt, as well. The leaves, seeds, stem, and roots of the plant are harvested for various products and uses.

Figure 3 - Stinging nettle vegetative growth ready for harvest. (Photo credit: Doug Goldman, USDA PLANTS 2023)

Leaf Harvest

Harvest leaves in early spring when they are small and tender for culinary and medicinal products. To increase leaf production, harvest repeatedly. Additionally, increase leaf production by harvesting the tops just above a node, therefore preventing flowering. If harvesting for a buyer, follow the buyer's product quality requirements such as cleanliness by preventing dirt or other vegetative matter mixing with the harvested nettles.

A field trial conducted by Kansas State University Agricultural Experiment Station and Cooperative Extension Service demonstrated that harvest potential could nearly double between year one and year two of cultivation. They reported a yield of 8.6 ounces of dried herb per plant harvested in year one; in year two, 15 ounces of dried herb per plant harvested (DeArmond and Janke 2004).

Seed Collection

Seeds can be collected in early fall. Shake seeds from the seed head into a jar or bag. Shade-grown plants produce approximately 500 to 5,000 seeds per shoot while plants growing in full sun produce

10,000 to 20,000 seeds per shoot (Bassett et al. 2007). Seeds have been shown to successfully germinate in a greenhouse environment after 10 years of storage in a cool and dry environment. Seeds also have culinary and medicinal uses.

Root Harvest

Harvest the root in the fall. If harvesting the root for a medicinal product, follow the buyer's product quality requirements such as diameter, length, cleanliness, and other characteristics. Living root rhizomes can also be used for propagation purposes, if harvested in the fall or spring. If transplanting rhizomes, prune back most of the leafy growth to avoid mortality by evapotranspiration.

A field trial conducted by Kansas State University Agricultural Experiment Station and Cooperative Extension Service reported, nearly one ounce of dried root per plant was harvested in year one. In year two, 6.5 ounces of dried root per plant were harvested.

Processing and Packaging

Wear clean gloves and long sleeves when handling the plant prior to processing. The plant can be handled without risk of stinging after cooking, drying, crushing, or blending. The leaves, seeds, stems, and roots of the stinging nettle plant have culinary, medicinal, and fiber uses.

Culinary

- Greens
- Rennet, for cheese production

Medicinal

- Dried, loose-leaf tea
- Tinctures
- Infused vinegars
- Oxymels
- Root decoction or tea
- Cosmetics (cream, salve, balm, foot soak, bath herb, liniment)

Fiber

- Dye
- Fiber material

Market Potential and Sales Information

Stinging nettle is a plant species with multiple uses and products to diversify your revenue streams.

Direct-to-consumer (farmers market, on-farm stall, festivals, online store)

- Before engaging in direct-to-consumer sales, make sure to have experience consuming the plant in the way it will be marketed. For example, have some tea made from dried nettle, or eat some greens with eggs for breakfast. Customers may engage in direct-from-producer purchases because they desire fresh product, but also because they desire to learn about the product through live conversation. Learning to speak knowledgably and eloquently about the flavor or benefits of a product can increase direct-to-consumer sales.

Wholesale (restaurant, grocer, food hub)

- The Appalachian Harvest Herb Hub's 2021 records report: $13 per pound (dried leaf and stem) and $24 per pound (dried leaf only, organically grown, no certification needed). The Appalachian Harvest Herb Hub is part of Appalachian Sustainable Development and actively works to support and promote sustainable agroforestry and forest farming in central Appalachia; their warehouse is in Duffield, Virginia. They purchase fresh and dried woodland medicinal plants and provide new and existing producer assistance through technical support. Find out more about Appalachian Harvest Herb Hub and connect directly with their staff through their website: https://www.asdevelop.org/programs-resources/herbhub. If a grower is planning to sell product to them, the Appalachian Harvest Herb Hub requires a certificate of origin for all products. This requires the following information:
  - Date
  - Common name
  - Latin name
  - Harvest date
  - Harvest location
  - Harvester name
  - Lot number
  - Invoice number
  - Pesticides used or not
  - Production method

Technical and Financial Assistance Programs

The cultivation of stinging nettle in moist forest communities and riparian areas may qualify for state and federal technical and financial assistance programs. The following programs are West Virginia specific and this list is not exhaustive. Please email forest@future.edu if you wish to discuss technical and financial assistance in more detail.

WV Forestry Stewardship Program

"The West Virginia Forestry Stewardship Program offers technical and financial assistance to private landowners interested in planning and managing their forestland for multiple-use benefits including wood products, wildlife, recreation and aesthetics."
Link: https://wvforestry.com/management-assistance/stewardship-program/

Specialty Crop Block Grant

"Fruits and vegetables, tree nuts, dried fruits, horticulture, and nursery crops (including floriculture). Eligible plants must be cultivated or managed and used by people for food, medicinal purposes, and/or aesthetic gratification to be considered specialty crops. Processed products shall consist of greater than 50% of the specialty crop by weight, exclusive of added water."

References

Bassett, I. J.; Crompton, C. W.; Woodland, D. W. 1977. The biology of Canadian weeds. 21. Urtica dioica L. Canadian Journal of Plant Science. 57: 491-498. [24185]

Buckner, Heather. "How to Grow Stinging Nettle in Your Garden". *Gardeners Path*. https://gardenerspath.com/plants/herbs/grow-stinging-nettle/. Accessed April 14, 2022.

DeArmond, Jeanie and Rhonda Janke. *A Grower's Guide: Stinging Nettle*. Kansas State University Agricultural Experiment Station and Cooperative Extension Service. 2004

Mitich, Larry W. "The Nettles." *Weed Technology* 6.4 (1992): 1039–1041.

USDA, NRCS. 2023. *PLANTS Database*. National Plant Data Team, Greensboro, NC 27401-4901 USA. https://plants.sc.egov.usda.gov. Accessed September 11, 2023.

Non-discrimination Statement