

Research Investigates Relationship Between Commercial Ginseng Cultivation and Wild Populations in Pennsylvania

By Rachel Palkovitz, Ph.D. Candidate,
Department of Anthropology, Penn State University

How “wild” is Pennsylvania wild ginseng? The answer is complicated! As concerns about the long-term survival of wild American ginseng (*Panax quinquefolius* L.) have risen in recent years, our team of researchers from Penn State and the U.S. Geological Survey (USGS) have turned to commercial cultivation centers in the Midwest to ask what happens to ginseng under intensive human intervention — and how this might influence wild populations in Appalachian forests.

People have been harvesting ginseng for thousands of years for its medicinal properties, and more recently have been cultivating the plant on small forest farms and in commercial gardens using artificial shade. Central Wisconsin and Ontario, Canada are the main “hubs” of commercial ginseng production in North America, and they grow a LOT of ginseng. In 2020, Marathon county, Wisconsin was reported to have produced approximately 1 million pounds of ginseng root across all the active farms in the area; Hsu Farms, one of the major operations, produces 200,000 to 300,000 pounds of root annually (Dahdahm 2020). A recent survey found that 26% of Pennsylvania forest farmers use ginseng seed from commercial sources to augment their forest farm crop (Burkhart et al., 2021).

Commercial ginseng cultivation has greatly expanded the number of American ginseng plants being grown, but environmental groups report that wild ginseng populations are declining in parts of their native range due to a combination of human harvesting and browsing from white tailed deer (*Odocoileus virginianus*) (McGraw, 2013). American ginseng has been protected under CITES (Convention on the International Trade in Endangered Species of Wild Flora and Fauna) since 1975, but understanding the actual threat levels that different wild ginseng populations face remains a major challenge.

As a Ph.D. candidate at Penn State, my research investigates how ginseng cultivation practices may shape genetic and morphological diversity in American ginseng. Does large-scale human cultivation alter the genetic and physical composition of the plants? If so, what does this mean for remaining wild ginseng populations? Because this

is a big question, and a complicated one, I am approaching it from three different angles. The first approach utilizes genetic markers that have been developed and implemented by Dr. John Young and other USGS researchers to detect population level variation in American ginseng (Young et al. 2012). My research advisor Dr. Eric Burkhart has been working with USGS and Dr. Sarah Nilson from Penn State Beaver for several years to explore the genetic diversity of wild Pennsylvania ginseng. In order to protect native populations of ginseng into the future, it is important to know how much genetic variation exists — because genetic variation forms the basis of how organisms adapt and evolve in their environments.

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Wild ginseng in a Pennsylvania forest.



President's Letter

It is an exciting time to be part of the collaborative work at the PA Native Plant Society (PNPS). As our mission states, PNPS advocates for the conservation of native plants and their habitats and promotes the increased use of native plants in the landscape. How do we achieve this mission? Every plant matters as well as every conversation with neighbors. We have a role to play in educating our townships, school boards, and legislators about the significance of native plants and engaging them to support our mission. The PNPS Board of Directors is working to meet this mission through the work of our committees and chapters.

Here's an overview of our committee work:

- The **Education and Outreach Committee** coordinates tabling events across the state reaching thousands of people every year as well as providing the print newsletter to you, our e-newsletter, and a website full of resources.
- The **Grants Committee** expanded this year to include grants for both demonstration gardens and educational research, awarding 6 (\$500) grants. Your membership dues directly support these initiatives. You can help by spreading the word about the opportunities in your community. The request for proposals will be posted during late winter.
- The **Chapter Committee** continues to develop Chapters across the state in Eastern, Central, and Western Pennsylvania. We provide monetary resource and educational materials to the chapters expanding our network with regional members. Want to start a chapter? Email us at
- The **Membership Committee** is developing a survey to better understand demographic information, behaviors, greatest concerns, and the assets of the PNPS membership. Don't forget to renew and think about giving a membership as a gift. Let's grow the movement!
- The **Events Committee** produced a phenomenal Central PA Native Plant Festival this year with over 1,200 people in attendance, netting \$5,000 in profits, and launching our PNPS Green Seal Native Plant Nursery Pledge. Other events this year included a sold-out garden tour, hikes, and educational events in our chapters, as well as our upcoming Annual Meeting.

- The **Noxious Plant Committee** has been working to reduce the use of noxious plants across the State, encouraging the transitioning to native plants. The centerpiece of this work is the PNPS Green Seal Native Plant Nursery Pledge, launched this Spring, is our initiative working to promote growers who meet the following criteria:

- Sell at least 50% native plants (according to BONAP)
- Not sell any noxious species listed in our Dirty Dozen
- Not sell any plant material treated with neonicotinoid pesticides.

Looking forward we hope to expand the Green Seal Pledge to include municipalities, landscape, and natural resource professionals, as well as public and private gardens.

If you know a nursery that would like to make the Green Seal Pledge, please visit our website.

This committee has also been working closely with the collaborators at the PA Department of Agriculture Noxious Plant and Weed Council toward the development of a buyback program in the state and the reduction of noxious plants in the Commonwealth.

- The **Organizational Development Committee** has been busy updating our Bylaws as well as continuing to strategically develop our Board with diverse representation across the state.

I am looking forward to seeing you at our Annual Meeting at the end of September!

Sincerely,
Andrea Ferich, President

Don't Forget to Renew!

Please be sure to check your membership expiration date above the mailing label. PNPS membership is a bargain, just \$15 for regular annual membership.

Join or Renew online:

www.panativeplantsociety.org/join-us

Or send your check to:

PNPS
PO Box 807
Boalsburg, PA 16827

Be sure to write membership on the memo line of your check. And thanks for your support!

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2023 Annual Meeting

Date:
September 30, 2023

Time:
10:00 am–2:00 pm

Location:
Shaver's Creek Environmental Center
3400 Discovery Road
Petersburg, PA 16669

Schedule:

9:00–9:45am
Morning bird walk with Doug Wentzel

9:45–10:05 am
Welcome and business meeting

10:05–10:45 am
**Rachel Palkovitz, Penn State University,
American Ginseng Research**

10:45–10:55 am
BREAK

10:55–11:40 am
**Justin Mansberger, Penn State Extension,
Choose Native Program**

11:40–11:50 am
BREAK

11:50–12:20 pm
Grant Awardees

12:20–12:50 pm
Lunch (bring your own)

12:50–2:00 pm
Plant walk and plant sale

2:00 pm
Adjourn

This meeting is free and open to the public.

Shaver's Creek Environmental Center

Speakers

Rachel Palkovitz, Penn State University

TITLE: American Ginseng Research

Rachel is working with Dr. Eric Burkhart and a team of researchers from Penn State and the U.S. Geological Survey to understand how human planting practices may be shaping genetic relationships among American ginseng populations. For her dissertation, she is using quantitative and qualitative methods to assess whether human stewardship has shaped the evolution of the species in ways we can detect using physical markers on the above-ground traits in the leaves and inflorescences. The ultimate goal of her research is to develop a practical, non-invasive guide that forest landowners can use to assess the ginseng on their property to prioritize native lineages for seed banking conservation efforts.

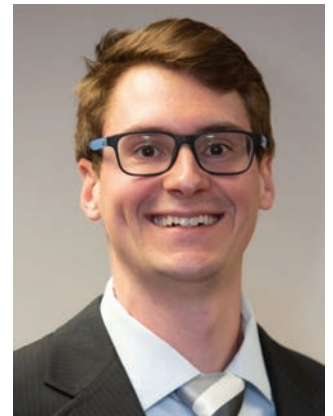
BIO: Rachel Palkovitz is a 4th year Ph.D. student in the Anthropological Genomics Lab in the Anthropology department at Penn State. She researches how human behavior impacts the evolutionary biology of non-human species, especially culturally significant native plants in the United States facing conservation threats in the wild. Her other interests include citizen science and wildlife education; she volunteers at Shaver's Creek Environmental Center in the Wildlife Education and Engagement Program.



Justin Mansberger, Penn State Extension

TITLE: Choose Native: A Statewide Look at Landscaping and Water Gardening

BIO: Justin Mansberger is a Water Resources Educator and Master Watershed Steward Coordinator for Penn State Extension. He manages the MWS Program in Westmoreland, Indiana, and Armstrong counties by coordinating volunteer projects and educational opportunities for stewards in the program. Justin is based in Westmoreland County but provides stormwater and drinking water education to most of Southwestern PA. He attended PSU where he received his B.S. in Ecology and recently graduated from Duquesne University with a M.S. in Environmental Science and Management.



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The second approach I use in my research is examining morphological diversity—how the physical characteristics of wild ginseng plants may differ according to their genetic makeup. To do this, Dr. Burkhart and I are collecting digital scans of ginseng leaves and other above-ground features like the inflorescence with a portable scanner in the field. I am studying above ground traits because these are features people can use to identify native lineages without disturbing the plant. I spent the last two summers with Dr. Burkhart and other members of the research team collecting genetic and morphometric samples from commercial farms in Marathon County, Wisconsin and Kitchener, Ontario, as well as wild sites across Pennsylvania. I will compare cultivated and wild samples to understand the genetic relationships between cultivated and wild populations, and which physical characteristics can help growers and resource managers distinguish where the stock originated from.

Using a combination of genetic and morphometric markers will give us a better understanding of how ginseng varies biologically across populations, but a big part of the puzzle remains: how do we know what happens to American ginseng under commercial cultivation? For example, where do the seeds come from? How are plants selected for propagation, and how are they grown and distributed across the United States? The answers to these questions will not only help us interpret



Collecting cultivated ginseng samples in Wasau, Wisconsin.

our results from genetic and morphometric analyses; they will also provide insights into how we might conserve native lineages of wild ginseng in the future. To answer these questions, my third approach in the research involves conducting key informant interviews with ginseng growers in commercial and forest farm settings to understand the human dimension of ginseng cultivation and the movement of genetic material across the growing regions.

Our long-term goal with this research is to translate it into germplasm conservation efforts aimed to promote native lineages of wild ginseng. Our work is supported by a Wild Resources Conservation Grant from PA DCNR, and a Sustainability grant from the State College of Liberal Arts. If you are a ginseng forest farmer and would like to learn more about this study, please email me (Rachel Palkovitz) at: rep5378@psu.edu.

Works Cited:

- Burkhart, E. P., Nilson, S. E., Pugh, C. V., & Zuiderveen, G. H. (2021). Neither Wild nor Cultivated: American Ginseng (*Panax quinquefolius* L.) Seller Surveys Provide Insights into in situ Planting and Husbandry1. *Economic Botany*, 75(2), 126–143.
- Dahdah, J. (2020). It's in the soil: Wisconsin's ginseng is world renown. *Spectrum News1: Agriculture*.
- McGraw, J. B., Lubbers, A. E., Van Der Voort, M., Mooney, E. H., Furedi, M. A., Souther, S., Turner, J. B., & Chandler, J. (2013). Ecology and conservation of ginseng (*Panax quinquefolius*) in a changing world: Ecology and conservation of ginseng. *Annals of the New York Academy of Sciences*, 1286(1), 62–91.
- Young, J. A., Eackles, M. S., Springmann, M. J., & King, T. L. (2012). Development of tri- and tetra- nucleotide polysomic microsatellite markers for characterization of American ginseng (*Panax quinquefolius* L.) genetic diversity and population structuring. *Conservation Genetics Resources*, 4(4), 833–836.



Commercial ginseng garden in Ontario, Canada.

2023 Plant Festival Finds a New Home

By Diane Albright

The 2023 Central Pa Native Plant Festival and Sale had a successful debut at its new home this year — Millbrook Marsh Nature Center with near-record turnout. Of course, the beautiful weather contributed, but we estimated over 1100 people came to buy plants, and boy, did they! The natives were flying off the tables. Presentations were well attended and had the luxury of being in the indoor barn classroom. Many thanks all the vendors, information booth participants, presenters, and volunteers. And an especially big thank you to all the visitors who came to support us!

We had 8 vendors showcasing their native plants plus our ever popular Member Donated booth. Many people took advantage of pre-ordering from our vendors to ensure they didn't miss out on that special plant they've been looking for.

Due to the popularity of our members-donated plant table we plan to include a fall member-donated sale at the annual meeting on September 30. So, this fall or next spring as you are dividing plants in your gardens, remember to pot up a few for both sales.

To donate plants for either sale, contact us at Info@PaNativePlantSociety.org. And of course, we are always looking for new ven

This meeting is free and open to the public but we ask that you register in advance. Visit our website: www.panativeplantsociety.org.

ABOUT OUR NEW HOME

Millbrook Marsh Nature Center, located in State College, Pennsylvania, less than two miles from Penn State University. The Centre Region Parks and Recreation Authority operates the Nature Center and is a 501(c)3 non-profit organization. The park is a 62-acre site consisting of a 12-acre farmstead area and an adjacent 50-acre wetland area. A Conservation Easement between Penn State and ClearWater Conservancy protects the wetland from future development. Visitors enjoy a boardwalk, nature trails, special events, and seasonal programs offered by the Nature Center.

www.crrp.org/millbrook-marsh-nature-center

Mark your calendar for next year!
May 4, 2024 — again at Millbrook Marsh



Agriculture & Nature
Policy and Practice
Andy Bater
SwitchgrassFarmer@gmail.com

A photograph showing three people walking through a lush garden. In the center, a woman with white hair, wearing a blue polo shirt and a plaid skirt, is gesturing with her hands while talking to two other people. To her left, a man in a green t-shirt and jeans is walking. To her right, a woman with dark hair, wearing a light-colored t-shirt and a backpack, is also walking. They are surrounded by dense green foliage and numerous pink flowers.

Centre Region Growing Greening Tour Gaining Steam

By Kristen Devlin

After a successful pilot effort in 2022, the Centre Region Growing Greener Garden Tour returned this year to engage 70+ Centre Region residents in a one-day event designed to showcase habitat-friendly residential landscaping in several different contexts. This year's event took place on Saturday, June 10, in the Boalsburg area of the region and featured four properties, which participants toured in a self-guided fashion, including a large sunny lot, a small sunny lot, a large lot with both sun and shade, and a pollinator meadow. More information about each property can be found on the event website: <https://sites.google.com/view/growing-greener>.

Homeowners and volunteers from PNPS, the Pennsylvania Master Naturalist program, and the ClearWater Conservancy were onsite to answer participants' questions and enhance learning opportunities at each property. In addition, PNPS and the ClearWater Conservancy had information tables set up at two of the sites, where participants could learn more about Pennsylvania native plants and related habitat-conservation efforts.

The tour offered participants the opportunity to see numerous examples of PA native plants and how they can be used in the home landscape, including bush clover, button-

bush, cup plant, enchanter's nightshade, golden ragwort, summersweet, liatris, native roses, serviceberry, various species of aster and goldenrod, oaks, sassafras, maple, hemlock, and many more.

The Growing Greener tour is organized as a service project for the Pennsylvania Master Naturalist program (pamasternaturalist.org), which is a statewide partnership initiative that connects people with their local ecosystems through intensive natural science training and local conservation service work.

Master Naturalist Volunteer Kristen Devlin, who also is an at-large PNPS Board Member, leads the effort of planning this tour, in partnership with the Pennsylvania Native Plant Society, the ClearWater Conservancy (www.clearwaterconservancy.org), and Sustainable Centre Region (<http://bit.ly/Sustainable-Centre>). This year's event remained free, although participants were encouraged to make a donation to PNPS or ClearWater Conservancy, resulting in several hundred dollars raised for the two non-profits.



PNPS BOARD OF DIRECTORS BALLOT • 2024-2025 TERM

NEW CANDIDATES

On the ballot for the 2024–2025 term

Cathryn Pugh (On the ballot after being appointed as Vice President by the Executive Committee. She will transition to President for the 2025–2026).



David Ahakinian (Recording Secretary)

David volunteered to serve as Recording Secretary for the Board this summer and was appointed by the Executive Committee. We greatly appreciate his service. *No photo is available.*



Jaci Braund – Incumbent serving since 2021.

Jaci is an ecologist with the Pennsylvania Natural Heritage Program. Professionally Jaci works primarily on classifying plant communities and surveying rare plant species within PA. She has a growing interest in the intersection of climate change and forestry, and increasing outreach and advocacy on behalf of our native species.



Linda Ferich

A Pa Master Naturalist, Chesapeake Bay Landscape Professional, National Wildlife Federation Habitat Steward/Host and Coordinator of Lancaster Conservancy's Community Wildlife Habitat initiative Linda started the Lancaster Native Plant Alliance, a PNPS chapter. Her passion for natives and ecology run deep and have been passed onto her daughter Andrea, who is the current President of PNPS.



Mara Hartzell

Appointed to the Board in 2022, Mara works as a staff assistant at Millbrook Marsh and played a critical role in the organization of our Central PA Native Plant Festival this year. When not in her backyard or community garden plot converting any available space to natives, she can be found volunteering and hiking around Centre County.



Cathryn Pugh

Cat, like her favorite plants, is a Pennsylvania native. She grew up in the small town of Wyalusing, PA, and moved to State College, PA, to pursue a graduate degree in Forest Resources. While a student, Cat conducted ethnobotanical research to study the relationship between Pennsylvanians and a native spring onion called ramps or wild leeks (*Allium tricoccum*). This work inspired her interest in forest farming of edible and medicinal wild plants and fungi.

BALLOT

1. Cast your vote for four directors

☐ David Ahakinian

☐ Linda Ferich

☐ Jaci Braund

☐ Mara Hartzell

Write in

2. Cast your vote for one Vice President.

☐ Cathryn Pugh

Write in

3. Vote, yes or no, for the proposed changes to the PNPS Bylaws as posted on our website August 30.*

☐ Yes

☐ No

Please complete and return your ballot to be counted:

Ballots sent by mail and email must be received by September 25, 2023.

• By Mail: PNPS, PO Box 807, Boalsburg, PA 16827

• By Email: info@panativeplantsociety.org

Or vote in person at the annual meeting on Sat., September 30, 2023.

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* Updates of the PNPS Bylaws have been proposed by the Board of Directors. Please visit panativeplantsociety.org/bylaws to review changes and cast your vote to approve. Printed copies are available upon request. Email info@panativeplantsociety.org.



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