

The Sharpshooter

Oregon Society of Soil Scientists

Quarterly Newsletter

Spring/Summer 2023



President's Message

Welcome to the Spring/Summer edition of the *Sharpshooter*, the official newsletter of the Oregon Society of Soil Scientists! This is Vance Almquist writing as the newest President of OSSS. In the time since our last edition, a wildly successful winter meeting took place in the lovely locale of Hood River, and we've begun planning the fast-approaching summer field tour. While you can read all about the winter meeting later in this edition, I want to praise now past president Alicia Leytem for all of her hard work and for putting together a thought-provoking line-up of speakers who discussed, among other topics, soil health management on tribal lands, first foods and the soils which support them, and the management of cultural resources in the region. Thank you again to the kind orchardists, Ed and Robin of [Upper Valley Farms](#), and to Yesenia and George of [Pear Bloom Farms](#), who very kindly hosted our field day.

Political bright spots might seem rare these days, but this legislative session, a bill nicknamed the "Healthy Soils Bill" ([HB 2998](#)) has been moving forward in the house. This bill would establish a soil health initiative in Oregon and passage of this bill is a welcome acknowledgement of the soil research needed to support informed decision making by agriculturalists across the State.



Winter Field Tour 2023

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Pam Keller, the chair of the newly formed Action Committee has written a piece detailing the bill and some of the benefits which can be found later in this edition. I am hopeful that we'll soon celebrate the successful passage of HB 2998, another noteworthy contribution of OSSS to the protection of the State's soils.

Finally, a small but significant change is currently taking in how the Society handles membership. At the winter meeting, OSSS membership voted to link membership to event attendance. Effectively, this means that the price of membership will be included in the cost for registration. This change is the result of a several yearslong discussion and was the board's recommendation to address the ongoing challenges of keeping membership records up to date and interfacing with the society's digital infrastructure. In addition to the administrative benefits of this change, it represents a significant change in the society's stance on membership by emphasizing active participation. However, throughout the course of our discussions it became apparent that it may not be possible to attend an event in any given year, so we are actively assessing alternative pathways for would-be-attendees to maintain some form of member status. I am looking forward to providing an update to this issue in the next edition of the Sharpshooter. In the meantime, enjoy all that this edition has to offer, mark the summer tour on your calendars, and keep up all the good that you do!

Vance Almquist, OSSS President

Message from the Editor

Hello All and welcome to the spring/summer edition of *The Sharpshooter*. This is my first edition as the new editor and I am excited bring news to all the soil lovers out there! ! In this edition we have an article on ancient Egyptian soil classification , winter meeting recap, NRCS mapping updates, action committee updates, , Oregon Envirothon, and news on upcoming events .

Please reach out with any ideas for future articles or if your interested in writing an article.

osss.editor@gmail.com

Sarah Brame

Winter Meeting Recap

This year's winter meeting at the beautiful Hood River was a huge success! The turnout was great, the venue was beautiful, and the food was delicious. People came from all over the state to talk soils. The presenters shared cultural and pedogenic history of Oregon, with a focus on cultural aspects of the region's history.



Figure 1– Scott Burns presenting on the geology of Oregon and the Columbia River Gorge at the 2023 Winter Meeting in Hood River, OR.

The conference started off with an energetic lecture delivered by Dr. Scott Burns regarding the geologic history of the Columbia River Gorge. This was followed by presentations from Eric Quaempts and Amanda Lowe from the Confederated Tribes of the Umatilla Indian Reservation on first foods management and their relationship to local soils followed by a presentation by Kevin Hudson detailing soil health practices being implemented on CTUIR land. The afternoon, forest service archaeologists, Bobby Sanders and Chris Donnermeyer, presented on cultural objects in the soil, the importance of culture resources and what to do if encountering items as soil scientists. This was followed by an update on healthy soils policy in the 2023 State legislature by Megan Kemple. The conference ended with student poster presentations and a fun silent auction.



Figure 2: Vance Almquist leading a discussion soil geomorphology

The field day we explored soil pits around Mt. Hood and learned about the Upper and Lower Hood River Valley soils and geology. The first stop we visited an organic apple farm in the upper valley where we examined two Andisol soil pits, originating from transported basaltic/andesitic deposits (figure 2 & 3). We ended the visit with a delicious cup of cider from our gracious hosts.



Figure 3: Backhoe trench exposing a disturbed example of the Dee soil series

The second stop we visited Pear Bloom Farm located in the lower Hood River valley. Here we examined two different soil pits that displayed differences in subhorizon development from hydrologic influences, one with a subsurface argillic horizon and the other a fragipan (figure 4).

Overall, the event was both educational and fun. Many connections were made and friendships formed. *Sarah Brame*



Figure 4: Soil pit (Wyeast series) with a fragipan !

Tanen and Predynastic Egyptian soil classification

The ancient Greek tourist Herodotus of 2,452 years ago famously called Egypt the gift of the Nile, and Greek religion and agriculture in turn, the gift of Egypt. Both Egyptian religion and agriculture according to myth came from Tanen (Fig. 1), whose history and early life are unclear. In some accounts, Tanen is a predynastic ruler, in others a demigod, a hermaphrodite, or composite god Ptah-tanen or Tatanen.

Tanen's contribution to geological and soil sciences was the earliest known land and soil classification dating back about 5000 years. Hieroglyphic text from the Ptolemaic (237 BCE) Temple of Horus at Edfu outlines a creation myth, with emergence of the first mound from primeval waters, and then the subsequent emergence of other "paylands" of distinct kinds. Eve Reymond translated "paylands" as different soil types, or "the place in which the substances of the earth are endowed with special power". The Edfu text also specifies rituals for temple establishment, along with temple design and size administered by Tanen. The scheme of ten paylands on the inside of the northern enclosure wall of the Edfu Temple is for the area around Edfu, and the scheme of eight paylands near the pronaos is for a more remote area. The difference between the eight and ten payland version is lack of the high hill with stony soils and red woodland soils, which are recognizable as Orthent and Xeralf soils. The eight payland version may correspond to the lower soil diversity of alluvial plains of Lower Egypt, and the ten payland version as the greater soil diversity of Upper Egypt, as interpreted by Eve Reymond. An alternative view of Ragnhild Finnestad, using ancient Edfu tax records, is that paylands were local villages, and part of a religious processional ritual recapitulating creation, in a way broadly comparable with Christian stations of the cross. Both interpretations are plausible, and not mutually exclusive.

Orthent rocky soils of hill tops are widespread in Upper Egypt today. Egypt no longer has Xeralf woodland soils, although the widespread Omda paleosol is evidence of Xeralfs existing in Egypt

some 7500 years ago. Orthent soils have been documented from ancient temples of Re and Nut, and Xeralf soils from ancient temples of Thoth and Hathor. The other eight paylands may also be inferred from soils at the temples of deities indicated by the Edfu text. "Born of water" and "house of appearing" paylands are soils like those at



Figure 1– Tanen , Egyptian deity of the primordial mound

temples of Ptah and Sekhmet, the famous alluvial soils (Fluvents) of Egyptian corporate agriculture that emerge after annual floods. “High seat” and “place of piercing” paylands refer to warrior cults of Amun and Neith, whose temples are on tells of anthropic soils littered with ceramic shards and other human artefacts. Equally clear are paylands of “underworld of ba” and “place of hiding” like soils of temples of Anubis and Anput, which are Psamments of sandy deserts and coastal dunes. “Powerful of ka” and “beautiful of seats” may be Xerolls like those at temples of Isis and Osiris. “Mound of the radiant one” and “the great place” may refer to visionary Horus and Bastet whose temples are on Xerepts of high ground of limited agricultural worth. “Place of the throne” and “making glories” paylands may refer to Khum and Satis, whose commanding temples on the Nile cataracts are Calcids, also largely uncultivated. This reconstructed classification reveals very ancient appreciation for different kinds of soils and their economic use as a basis for distinct religious cults.

Confusion over Tanen’s gender may be an accretion of myth from the variety of sexual personae of the cults administered, ranging from the masculine warrior cult of Amun and Neith to the feminine fertility cult of Isis and Osiris. In laying out temples and rituals to particular specifications, Tanen acted more like a vizier than a pharaoh. As a scientist Tanen was not a theorist such as Einstein, nor a synthesizer like Darwin, but a taxonomist like Linnaeus. Linnaean taxonomy gave strong scientific justification for European colonization of the rest of the world in the nineteenth century. Tanen’s location of temples of equal taxonomic rank near soils appropriate for that particular cult would also have had a unifying effect, enabling the architectural and other technical triumphs of Egypt’s Old Kingdom.

The Edfu texts can be regarded as the earliest known sacred and economic soil classification for Egypt, and Tanen as the father of soil science. Soils and their uses have shaped both our physical and religious lives for a long time.

Gregory J. Retallack, University of Oregon

FURTHER READING

- F.A.O. 1977. Soil map of the world. Vol. VI. Africa. Paris: UNESCO.
- Finnestad, R.B. 1985. Image of the World and Symbol of the Creator. Wiesbaden: Otto Harrassowitz.
- Retallack, G.J., 2023. The Sacred soils of ancient Egypt. *Geoderma*, v.429, p, 116191.
- Reymond, E.A.E. 1969. The mythical origin of the Egyptian temple. New York: Manchester University.
- Wilkinson, R.H. 2000. The complete temples of Ancient Egypt. London: Thames and Hudson.
- Wilkinson, R.H. 2003. The complete gods and goddesses of Ancient Egypt. London: Thames and Hudson.

Soil Survey in Oregon

In 2018 the NRCS embarked on a nationwide initiative coined [Soils2026](#) to map soils on lands where the National Cooperative Soil Survey is incomplete. In Oregon and Washington these are almost entirely public lands administered by the Forest Service (FS, see Figure 1). Soil survey work has been ongoing on some of these Forests for decades. On National Forests in the Blue Mountains for example (Malheur, Ochoco, Umatilla, and Wallowa-Whitman NFs), this work has progressed using contractors and agency soil scientists since the early 1990s with the support of Forest Service funding. Over the past 5 years, however, FS efforts have slowed as this funding has diminished considerably and competition for the dwindling appropriations intensified.

Discussions within the Federal Land Advisory Group that included the FS, BLM, National Park Service, and NRCS recognized the need for additional guidance to reinvigorate soil survey via the “Soils2026” initiative. As a result, a National Memorandum of Understanding (MOU) was drafted and signed by the two Chiefs of the FS and NRCS in late summer of 2020 defining the mutual benefit, terms, roles, and commitment of each agency to support these efforts.

Inherent to the National MOU is that the NRCS will conduct the lion’s share of the soil survey work in the field using their soil scientists. The FS role is as the lead agency for environmental and National Historic Preservation Act (NHPA) compliance, along with providing access. This commitment has been somewhat of a struggle initially as the two agencies coordinate and schedule the work. In Oregon, mapping on the Willamette and Deshutes NF continues, while on the Umpqua, Fremont-Winema, and Rogue River-Siskiyou NFs it’s just getting underway.

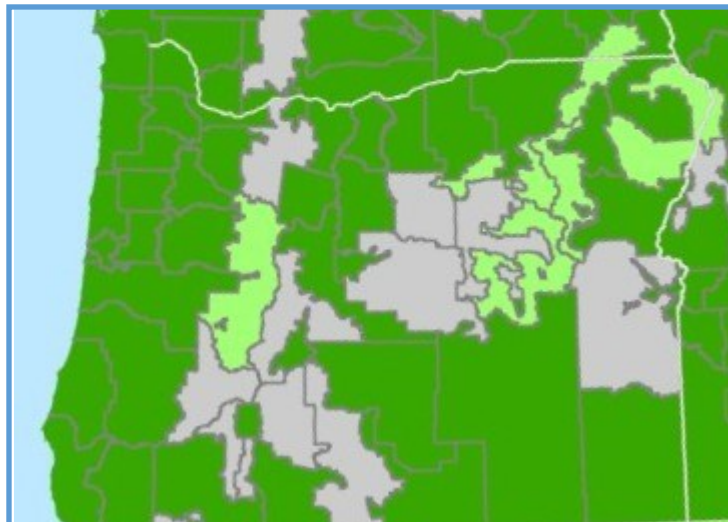


Figure 1. Status of Soil Survey Mapping in Oregon & Washington – Legend: Dark green = 100% complete, light green = In progress, gray = 0% complete.

Although it is not expected that Order 3 surveys will be delivered for unmapped areas by the end of 2026, the end products of this effort should result in at least an Order 5 or digital spatial framework from which to continue Cooperative Soil Survey into the future. Ultimately, the hope is to have all the public lands and National Forests in Oregon mapped so that statewide coverage is eventually achieved in a timelier fashion.

Todd Reinwald, OSSS Westside Director

Source: <https://websoilsurvey.sc.egov.usda.gov/DataAvailability/SoilDataAvailabilityMap.pdf>

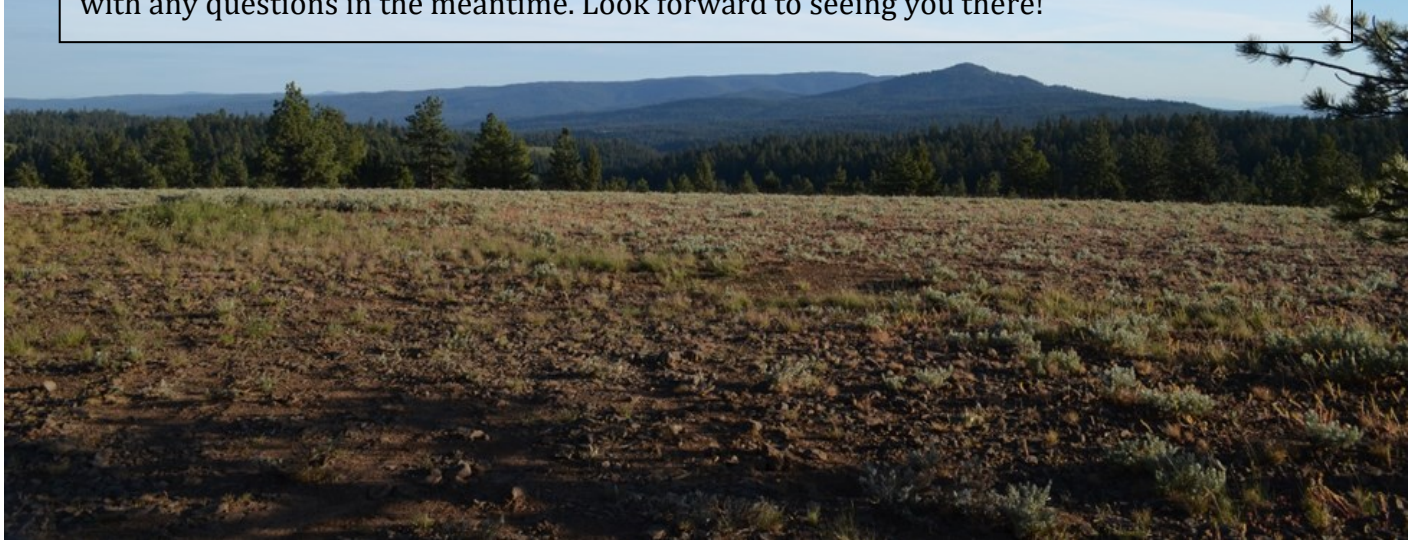


Save the Date

2023 OSSS Summer Field Tour

Sept 8-10th in the Ochoco National Forest!

This September 8-10th, OSSS is headed to the Ochoco National Forest for our annual field tour! The theme of the tour is “Soils 2026”, a reference to the digital approaches to soil mapping now being embraced with the goal of having a wall-to-wall soil map of the continental United States. From the collapsed mountains underlain by the John Day/Clarno formations, to the scab-stringer terrain underlain by Columbia River basalts, the landscapes of the Ochoco National Forest are an ideal location to illustrate and address a diverse set of questions pertaining to plant-soil-landscape feedbacks, drivers of soil heterogeneity, and practical approaches of incorporating expert knowledge into digital mapping frameworks. Exact location and field tour specifics to come, please reach out to OSSS.pres@gmail.com with any questions in the meantime. Look forward to seeing you there!



Other Events Coming up:

North American Forest Soil Conference July 16-21 Eugene OR

[Registration - 2023 North American Forest Soils Conference \(NAFSC\) \(nafsc2023.org\)](https://nafsc2023.org)

Action Committee Update

Many of you will have heard about the new OSSS “Action Committee” at our 2022 and 2023 winter meetings. As soil lovers, we are distressed to see the decline in soil science education and we also see opportunities to actively support soil conservation in the context of climate change issues. Members of OSSS comprise an important pool of much needed soils expertise.

The committee is informal group. Anyone in OSSS can join. The Board provides at least one member to serve as communication liaison and the committee obtains board approval for proposed actions. The committee communicates with the membership at the annual member meeting and occasionally in the Sharpshooter and by group email.

Our two focus areas and action taken this year

1) Expand Soil Science Program at OSU

Ensure that the core soil science curriculum i.e.) soil chemistry, soil biology, soil fertility, soil physics, and pedology, is available to OSU students. Industry, government, and nonprofit organizations struggle to find qualified soil scientists [and OSSS will](#) promote the value of a certified soil scientist. OSSS will encourage on-campus soil science education along with hands-on experience in the field.

Legislated funds often come to the OSU College of Agricultural Sciences and its Department of Crop and Soil Science. This year we have established new relationships with the college and awareness of OSSS is expanding and our input is valued.

The Oregon Higher Education Coordinating Commission (HECC) has a mission to promote high-quality postsecondary education for all. They have a Science Technology Engineering Math (STEM) council. We can work to ensure that quality soil science education a STEM goal.

2) Soils Legislation

Support by an association of professional soil scientists is impactful. OSSS can make a difference by

officially endorsing beneficial legislation. We can also send email alerts asking members to contact their representatives. Bills with some level of soil focus are showing up more frequently now because of climate/carbon attention. We have an endorsement checklist, subject to annual review by the membership. Legislation should have direct soils impact and have broad public benefit. To the extent possible it should be nonpartisan.

All bills will be flawed, but we can choose to support ones that do some good. Our influence on the text of bills depends on building relationships with key people and becoming known as a reputable source of soils expertise.

This year OSSS endorsed House Bill 2998 which would establish the Oregon Soil Health Initiative to leverage existing programs and new federal funding to expand state resources to support farmers and ranchers with soil health practices.

How do we engage?

- ◆ Many state agencies and commissions have advisory committees. OSSS members can seek out relevant committees and apply for membership.
- ◆ Oregon has 45 Soil & Water Conservation Districts. Every election cycle has open director positions. Oregon Association of Conservation Districts is a nonprofit that provides support and coordination for the districts.
- ◆ Join an Oregon nonprofit with a soils-relevant mission such as the Oregon Climate and Agriculture Network, 1000 Friends of Oregon, The Nature Conservancy of Oregon, Oregon Conservation Network, among others. These are a [critical source of information about proposed policy or legislation](#).
- ◆ Join the Soil and Water Conservation Society

- ◆ Sign up for email newsletters. I like those from the national Soil & Water Conservation Society and Soil Health Institute.
- ◆ Get to know Oregon state agencies and commissions with soils in their mission including:
- ◆ Oregon Watershed Enhancement Board, a common restoration funding avenue; Oregon Global Warming Commission, a key policy advisor to the legislature; Dept of Agriculture has a Soil Health Specialist who advises on legislation; Dept of Forestry, and Dept of Land Conservation & Development, important for land use policy and grants. Subscribe to get their news.
- ◆ The Institute for Natural Resources, located at OSU, leads many multi-agency/institutional programs at state, regional and national levels. It is a frequent recipient of legislated funds.

- ◆ Learn about current and proposed Natural Resources Conservation Service (NRCS) programs and follow the action on the Farm Bill which sets national conservation policy. This very important federal legislation is passed every 5 years and 2023 is the year!
- ◆ Make your voice heard. It's easy to comment on bills in the legislature and to communicate with your legislators. For bills being considered, submit your "testimony" when a hearing is scheduled. Send comments to the relevant committee members. Once a bill passes committee and goes to the floor, email, write or visit your legislators.

If you would like to be more directly involved in the Action Committee, please let me know! There are no must-do tasks and meetings are few (likely by zoom). It's a chance to brainstorm ideas on how to spread the love of soil!

Pam Keller

pam.mark.keller@gmail.com (503) 334-7345

CONTRIBUTE YOUR OREGON SOILS PHOTOS TO THE OSSS ARCHIVE



Send an email with the following and any additional information to morenov@oregonstate.edu to contribute to our interactive map of Oregon soils

01

High resolution photo of entire soil profile

Please only send JPG or PNG file format photos

02

A link to an Official Soil Description

If not yet described by the NRCS, share a brief description of the soil properties

03

Location of the soil profile

Include coordinates, general location or regional description

04

Photo credits

Include the name of photographer and source of the additional soil information

Oregon Society of Soil Scientists



Call for Scholarship Applications OSSS Scholarship: \$500 to \$1,000

Applicant Criteria and Required Materials

- Attending a college or university in Oregon in Fall 2023
- Pursuing studies in soil-related discipline
- Students studying related disciplines invited to apply if applicant relates studies to soil in essay.
- OSSS Scholarship application form (link below)
- Minimum 3.0 overall GPA
- Preference given to students who have not received an OSSS scholarship in the past 12 months.
- Unofficial transcripts (high school transcripts if high school student or 1st year college student, otherwise, college transcripts only)
- 500 – 1,000 word essay on soil
 - Significance and importance of soil
 - One or both of the following topics:
 - a) Goals for career objectives relating to soil
 - b) Personal interest in studying or enhancing soil

Application Deadline: 5PM PST Sept 1, 2023

<https://www.oregonsoils.org/links/scholarships/>

Send submissions and questions to:

oss.scholarships@gmail.com

2023 Oregon Envirothon

On May 5th 2023, well 92 high schoolers from 12 schools across the state of Oregon gathered to share their enthusiasm for natural resources at the Oregon Envirothon. 33 teams completed hands-on examinations in the subjects of soils, aquatic ecology, forestry, wildlife and this year's environmental is-



Figure 2: High schooler texturing a soil sample for the soils exam.

Special thanks to the Oregon Envirothon Soil Team for assisting the soils station and helping to inspire the next generation of pedologists! For more information about how you can support these efforts in the future, check out: <http://www.oregonenvirothon.org/> or the Oregon Envirothon Facebook page. Next year's event happening **May 3rd, 2024**- please let Marissa know if you are interested in helping out: marissa.theve@usda.gov.

Marissa Theve (Tev), Oregon NRCS Resource Soil Scientist located in Salem



Figure 3: High schooler texturing a soil sample for the soils exam.



Figure 1: Soils station helpers (left to right) Sarah, Jordan, Marissa, Casey, and Kristina

sue, "Adapting to Climate Change". Teams submitted oral presentations, which judges reviewed prior to the test, and the top two teams to the entire group. The high score for the soils test was 47 out of 50 possible points. While thanks to the Oregon Envirothon the Rogue Pack Alpha team from Logos Charter School in Medford came in first this year, all participating students are environmental champions. The winning team will take a trip to the national competition, hosted this year by Mount Allison University Tantrammar in New Brunswick, Canada July 23-29th.

Treasurer's Report - FY 2022 Summary

July means the start of a new OSSS fiscal year! And 2022 has been an eventful year for the treasury. In addition to transitioning treasury stewardship from Pam to myself, recently approved changes to how we process memberships will result in some changes to how income will be reported beginning in FY 2023. Below is a summary of FY 2022 finances. For more detail, we update our ledger monthly in our google drive, and summarize expenses in our board meeting minutes. As with Pam, feel free to reach out with a call or email if you have any questions!

Scholarships

At our Winter meeting we awarded a \$1500 scholarship to Mireia Roig-Paul. Also at the meeting, we received a \$250 scholarship donation from Matthew Fillmore and a \$500 donation from Duane Lammers. We thank our generous donors! OSSS also donated \$200 to Envirothon, a high school environmental education program.

Memberships

In FY 2022, we received dues for 22 regular memberships (\$1150 total), 4 student memberships (\$120 total), and one lifetime member (\$500). At the winter meeting, a motion was approved to simplify our membership tracking. Event registration will now include annual membership; if you attend an OSSS event, you are a member for that year. This change will be implemented beginning with our 2023 Summer Tour.

Operational Expenses

We paid \$47.12 in Stripe processing fees (\$0.30 plus %3 per transaction), \$395 for liability insurance, \$70 in Oregon State corporation and reporting fees, and \$176 for PO box rental. We also purchased \$222.25 in OSSS Hats for fundraising.

Advertising Income

We received no advertising income in FY 2022.

Summer Tour (September 2022)

We spent \$1701.65 on food, materials, and online registration hosting to support our excellent summer tour at Newberry Caldera. We brought in \$3080 through 30 regular and 5 student registrations for that event.

Winter Meeting (March 2023)

We spent \$8058.55 on catering, facility reservations, materials, awards, and online registration hosting for the winter meeting in Hood River. We brought in \$8150 in registrations, including 4 non-member, 34 regular, and 16 student registrations. Again, huge thanks to all who donated items to support our highly successful raffle! Our fundraising efforts from this meeting brought in \$863.

Current Bank Balance: \$14,994.07.

Megan McGinis, OSSS Treasurer



Featured Soil Profile

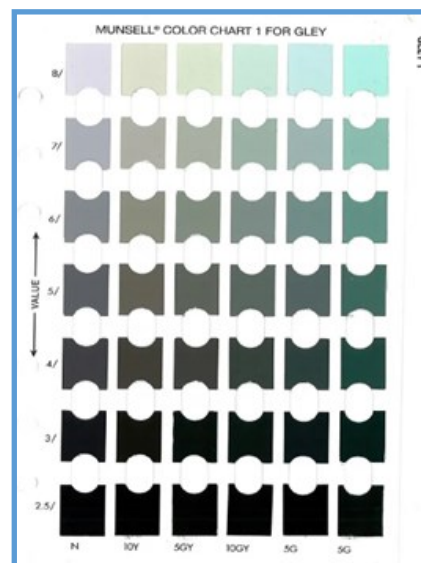
Blue Clay

Hydric gleyed soil profile



I came across this soil while doing field work and was fascinated by the coloring. Its not a soil color you come across everyday in Oregon. It was situated mid-slope (backslope) off a road cut on a convex slope with low elevation near Glide Oregon. Soil formed from weathered breccia/tuff with redox concentrations and smelled strong of hydrogen sulfide, indicating anerobic conditions. I did not have a Munsell color chart with me at the time, but likely a color from the gleyed pages.

Sarah Brame



Soil Orders

L B Q S B A J U A C X W P P B
H X G O M O L L I S O L S E B
A R E A O M T A T E R J X D J
C R L G O B Z O X W T J N H R
A O I R Z U Q D P Q B N W E A
L X S D G P Q A J Q V P L Z N
F I O A I V E R T I S O L S D
I S L J U S U L T I S O L S I
S O S M T Q O G Q Z W D V R S
O L M E V Q C L O S W F L I O
L S F H I S T O S O L S P W L
S P O D O S O L S F J V P O S
E E N T I S O L S U L D U G H
T Y B U I N C E P T I S O L S
J A O T R W B O I Z L A Q D Q

Inceptisols

Mollisols

Andisols

Alfisols

Aridisols

Vertisols

Entisols

Gelisols

Histosols

Spodosols

Ultisols

Oxisols



A selection of Winter Meeting Poster Session Abstracts

Title: *The Carbon Saturation of Oregon Soils*

Author(s): Drew Childs, Markus Kleber

For most soils, an increase of carbon levels will improve their productivity and capacity to perform other vital functions such as water filtration and removing C from the atmosphere. However, C concentrations cannot be raised indefinitely and will eventually reach saturation under continuous C input. This saturation level depends on the protective capacity of a soil, often approximated by its clay and silt content. Attempts to sustainably raise carbon levels in soils should therefore be focused on soils that are far from their specific saturation limit. Our data strongly suggest that attempts to raise soil carbon concentrations of topsoils should be focused on agricultural and range lands of Eastern Oregon and the Willamette Valley.

Title: *SHERLOCK assays can be used for rapid, accurate, and cost effective in-field testing for Sudden Oak Death*

Author(s): Roig-Paül, Mireia*, et al.

Abstract: *Phytophthora ramorum* is the causal agent of Sudden Oak Death (SOD), which is an economically and environmentally important disease causing up to 80% mortality of tanoaks in Pacific Northwest coastal forests (LeBoldus et al., 2022). There are currently four clonal lineages in the United States and Europe, named North America 1 (NA1), North America 2 (NA2), European 1 (EU1), and European 2 (EU2); only the first three are found in the Pacific Northwest. There is a critical need for fast, accurate, and inexpensive diagnostic probes to identify lineages. Specific High Enzymatic Reporter unLOCKing (SHERLOCK) (a Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) based assay) can be used to identify lineage from a sample based on polymorphisms unique to each clonal lineages' genome. With a detection limit of 100 copies of target DNA region template per μL , the SHERLOCK assay is a specific test that can be used in <1 hour, allowing for in field diagnostics. In the current work, we developed an assay specific for the NA1 clonal lineage. DNA from each of the lineages was extracted using a Qiagen DNeasy kit, with concentrations verified using a Nanodrop device. Genomes were scanned to identify diagnostic primers and guide RNA loci for each lineage, using the *krisp*-vcf algorithm. *Krisp*-vcf identified a region located on *Phytophthora ramorum* Pr102 scaffold 0001, position 225003 to 225626 that contained a unique single nucleotide polymorphism (SNP) within the diagnostic sequence for NA1 as compared to the other three lineages. Results of the NA1 SHERLOCK assay, including NA1 strains as positive controls as well as other lineages as negative controls, indicated the assay is lineage specific. This work provides a rapid assay for specific identification of samples for lineage NA1, the oldest discovered lineage of *P. ramorum* in the continental United States.

Winter Meeting Poster Abstracts

Title: Nitrogen Mineralization Following Balansa Clover Termination

Author(s): Christian Lessey

Abstract: The aim of this study is to analyze the mineralization rate of nitrogen following the termination of Balansa clover as a cover crop. Four different termination methods will be employed, including flail mower, flail mower followed by power harrow tillage, swather for biomass removal, glyphosate application, and a control plot with no Balansa clover growth. Each termination treatment will be replicated in quadruplicate. Additionally, three different termination timings will be implemented, namely early, mid, and late season termination, resulting in a total of 60 plots. The specific timing of nitrogen mineralization will be determined using the vanadium chloride/Griess method, followed by photometric analysis at 540nm.

Title: Evaluation of Potassium Fertilization on the Yield and Quality of Different Potato Varieties

Author(s): Pieper*, Jack., Torabian, Shahram., Qin Ruijun

Abstract: In the Columbia Basin, growers generally apply around 100 to 450 kilograms per hectare of potassium (K) fertilizer. However, little information is available for the source and rate of K fertilization for different potato varieties. Therefore, field trials are being carried out with two K fertilizer sources (Potassium Chloride vs. Potassium Sulfate) and five application rates ranging from 0 to 900 kilograms per hectare for three potato varieties (Clearwater Russet, Russet Burbank, Umatilla Russet). Throughout the growing season, the petiole K content and soil K content are being evaluated. Upon harvest, the yield and quality of potatoes will be determined. The first-year data showed that both K fertilizers had a similar effect on potato yields and quality. Currently, more data is being collected to make a conclusion on the optimum K fertilization rate and source.





OREGON SOCIETY OF Soil Scientists

The Sharpshooter is the official quarterly newsletter distributed to the members of the Oregon Society of Soil Scientists. Send address changes or inquiries about membership to: osss.pres@gmail.com or

OSSS | P.O. Box 391 | Corvallis, OR 97339

OSSS Webpage: www.oregonsoils.org

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1/4/ page—\$15

1/6 page—\$10

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Soil Scientists