



2024 Winter Prairie Project Newsletter

Merry Christmas and Happy New Year!



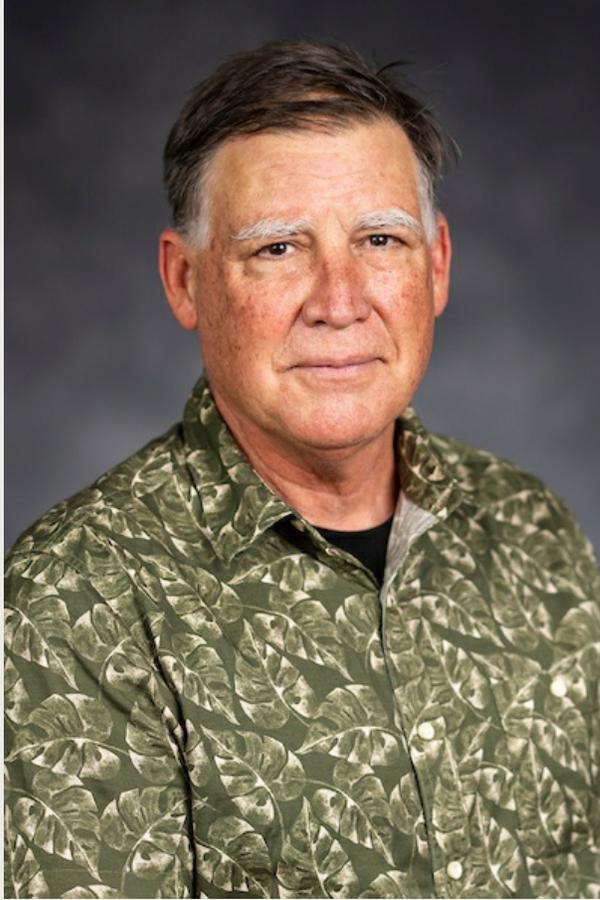
It's the most wonderful time of the year! We hope you had a very Merry Christmas and enjoy the warmth and magic of the holiday season.

From our team to you, may your holidays be filled with lots of love and laughter!

Faculty Spotlight: Dr. Brad Wilcox, Texas A&M University!

His research has been widely recognized for its scientific rigor and real-world applicability, influencing land management strategies across the globe.

Dr. Wilcox's scholarly achievements include over 150 peer-reviewed publications,



Dr. Brad Wilcox, Regents Professor and renowned researcher at Texas A&M University, is a leading expert in rangeland ecology and management.

With a career spanning over three decades, Dr. Wilcox has made groundbreaking contributions to the understanding of landscape dynamics, hydrology, and the impacts of land management practices on ecosystems.

many of which have set new directions in rangeland science. His interdisciplinary approach, integrating ecology, geography, and hydrology, has earned him accolades from professional organizations, including the Society for Range Management.

Beyond his research, Dr. Wilcox is deeply committed to mentoring students and fostering future leaders in natural resource management, reflecting his passion for advancing knowledge and societal impact.

As a dedicated educator, Dr. Wilcox teaches courses that challenge students to think critically about global challenges in rangeland systems. His work exemplifies the mission of Texas A&M University to create knowledge, solve complex problems, and prepare the next generation for success.

Welcome David Brooke!

David Brooke is the new Prescribed Fire Coordinator in Texas!

David will work to create an assessment of landowner and Prescribed Burn Association (PBA) needs through the Prescribed Burn Alliance of Texas, as well as identify opportunities to develop and



David will work to create an assessment of landowner and Prescribed Burn Association (PBA) needs through the Prescribed Burn Alliance of Texas. As well as identify opportunities to develop and support PBA's to facilitate the use of prescribed fire for rangeland function, grassland/savanna maintenance, habitat restoration, and/or wildlife mitigation. He will also lead the development and delivery of landowner workshops to generate interest in prescribed fire as a landscape tool while encouraging relationships among private landowner groups, county government officials and Volunteer Fire Departments.

support PBA's to facilitate the use of prescribed fire for rangeland function, grassland/savanna maintenance, habitat restoration, and/or wildfire mitigation.

AP Environmental Science Free-Response Questions and AP Annual Conference!



Due to interest from several cohort participants who taught AP Environmental Science (APES), Dr. Sakina T. S. Dixon and Bryan Yockers co-lead a free-response question (FRQ) working group to create Prairie Project-themed prompts for use as practice for the annual APES exam.

This resulted in four FRQs with accompanying scoring guides on the following topics: fire and bird diversity, grassland bird population decline, fire and forage quality, and rangeland ecosystem services.

The FRQs were showcased at the national AP Annual Conference in July 2024 along with Prairie Project lessons created by APES teachers Bryan Yockers, Dr. Rhonda Burrough, Shannon Chatwon, and Gaby Del Bosque-Hernandez. The presentation received praise from the College Board's Director of APES, Dr. Karin Gastreich, who stated the talk was her vision for how all the APES presentations should be at the conference.

Dr. Dixon also presented the FRQs at the Resources for Ecology Education - Fair and Share at the Ecological Society of American Annual Meeting in August 2024 and the Texas Section Society for Range Management Annual Meeting in October 2024.

Additional members of the FRQ working group included Tess

Sykes, Sheridan Swotek, and Danielle Williams.

Ecological Society of America (ESA) Annual Meeting



Data from the pre-post surveys completed by the students of the Educator Cohort participants were presented along with evaluation data from all three cohorts.

Additionally, four participants shared their Prairie Project lessons and action research findings:

The Dr. Ben Wu and Dr. Dixon co-organized a symposium at ESA titled, "Cultivating Educators as Agents of Change to Promote Rangeland Literacy and Advance Ecology Education".

Amy Leising, Teresa Walters, Dr. Jason Martina, and Dr. Letitia Reichart.

Prairie Project and St. Edward's University (SEU) Science Curriculum Writing Workshop



On Saturday, November 16, 2024, Dr. Dixon and Dr. Wu partnered with Cohort 2 participant, Dr. Amy Concilio, and her colleague, Dr. Steve Fletcher, to host a one-day workshop for 6th through 12th grade science teachers and community college instructors at SEU in Austin, Texas.

Drs. Concilio and Fletcher are faculty in SEU's Department of Political Science, Global Studies, Environmental Science and Policy. Attendees heard brief overviews of Prairie Project lessons from cohort participants Dr. Rhonda Burrough, Dr. Amy Concilio, Gaby DelBosque-Hernandez, Dr. Julie Flegal-Smallwood, Dr. Mark Hutchinson, and Dr. Letitia Reichart. For the remainder of the day, the cohort members served as mentors to the attendees and assisted them in creating their own Prairie Project-themed lessons.

Educator Cohort Participant Kudos!



Each year, EPA recognizes national winners for the **Presidential Innovation Award for Environmental Educators**. Among this year's winners were two Prairie Project cohort participants!

Region 6 winner, Shannon Chatwin, from Cohort 1, and Region 7 winner, Lee Stover from Cohort 3. The winners were honored during region specific live Q&As hosted by EPA this fall. Congratulations Shannon and Lee!



Region Dr. Rhonda Burrough won a grant from BP to study how native prairie vegetation could be used to offset carbon emissions as an alternative to turf grass. With conceptual assistance from fellow cohort members, Dr. Kelly Lyons and Lee Stover, Dr. Burrough's students conducted experiments to determine the net amount of photosynthesis in the system and measure carbon sequestration. Her student presented their results to BP using the poster below. Well done, Dr. Burrough!

Spotlight on BP Funding of a "Net Zero" Grant at Katy High School
Aiming for a Net-Zero Campus Using a Native Prairie Ecosystem as a Real World Model for
Nature-based Solutions to Carbon Emissions

Tiffany Gunawan, Samuel Gunn, Connor McCauley

Introduction to the Tiger Prairie
 The Katy Tiger Prairie was established through the initiative of students, teachers, and community members. In 2019, Katy High School began restoring an acre of public campus property to establish a **native Texas Gulf Coast prairie**. Currently, we now have a two-acre restoration in progress. The prairie serves as an outdoor classroom for students, as well as a green space for community outreach. The prairie also provides multiple ecosystem services such as a corridor for local wildlife, a water retention space for flooding events, and a nesting ground for a variety of threatened species, increasing biodiversity.

Background
 Balancing the amount of carbon entering and being removed from the atmosphere is the goal of net zero. The amount of carbon in our atmosphere has increased from 280 ppm pre to the industrial revolution to current values exceeding 420 ppm. According to the IPCC plans report, this increase carbon is the result of anthropogenic emissions, such as the burning of fossil fuels, resulting in increased global temperatures. **With this grant, natural carbon cycling, such as photosynthesis and soil respiration, will be modeled through hands-on activities that utilize comparison between turf grass test areas and a preexisting two-acre native prairie ecosystem already on our campus.** Understanding natural sources of carbon cycling will allow students to trace audit the campus, identifying human contributions or "leaks" to our school's carbon footprint. The prairie will then be used as a model of nature-based solutions, designing offsets that will move our school closer to a net-zero campus.

Focus of our Grant
 Nature-based solutions to the effect of carbon emissions is a new and interesting approach to changing climate. **Prairie vegetation will store 4 times the amount of carbon as turf grass due to their greater biomass potential and outlasting roots (store carbon).** Moreover, soil stores more carbon than the atmosphere and vegetation combined due to decomposed organic matter that makes soil biologically rich. Carbon removal from the atmosphere offsets the carbon releases on our campus through the processes of photosynthesis. Photosynthesis absorbs the carbon molecules from the atmosphere and converts it into oxygen and glucose. **By replacing typical turf grass sites with prairie vegetation, carbon storage by these native ecosystems can be used to offset anthropogenic emissions.** One of our main objectives store approximately 5 tons of carbon per acre due to the extensive root system of the ecosystem and the stability of roots.



Student Experiments
1. Photosynthesis and Respiration of Vegetation: Understanding the Carbon Cycle
 The oxygen probes supported by the grant has helped students understand the volatility and capture of CO₂ in the carbon cycle and how anthropogenic emissions has shifted the balance. Comprehending this balance is key when understanding the significance of "Net Zero". Students used dissolved oxygen probes to calculate the Net Primary Productivity of aquatic plants. This value is the net amount of photosynthesis (in terms of amount of carbon absorbed) conducted by the system.

2. Carbon Sequestration of Prairie Grasses VS. Turf Grass in Vegetation & Soils

To measure the carbon stored in vegetation, a sample in a 100x100 cm area is used to remove weeds and weighed. The data yielded a 1000% increase in carbon sequestration in prairie grass when compared to the common turf grass. Soils store carbon both biotically and abiotically. The biotic form, or **soil organic matter (SOM)**, is the desirable use of "the experiment". Students obtained samples 4" beneath the surface of the soil. Collected Samples were put in the oven to remove any excess water. Samples were then heated in a kiln at 753°F to remove the SOM. There was a **29% increase** in SOM going from turf to prairie soil. This result is a step in the replacement of turf grass areas with prairie vegetation as one of our Katy High School's colleges to reach "Net Zero" campus.

Next Steps: Students will be calculating the KHS carbon footprint using data from our energy, transportation, and waste usage. They will then calculate how many tons of carbon the Tiger Prairie offsets each year.

Student Engagement

bp

Thank you BP and the Katy ISD Educational Foundation for your generous support!

Texas A&M AgriLife Extension is hiring!

TEXAS A&M AGRILIFE EXTENSION | LIVESTOCK GRAZING COORDINATOR

The Livestock Grazing Coordinator works collaboratively to plan, develop and implement educational programs devoted to patch-burn grazing and pyric herbivory concepts. This is a full-time position with benefits, and is headquartered in Stephenville, Texas (with some remote work availability.) Salary is commensurate.

- Agency**
- Texas A&M AgriLife Extension Service
- Department**
- Rangeland, Wildlife & Fisheries Management
- Job Location**
- Stephenville, Texas | Some remote work available.
- Key Responsibilities**
- Maximize communication, education, and collaborative efforts among local, regional, and statewide conservation associations.
 - Supervise the activities of the regional sustainable grazing facilitators and support their work implementing educational programs and opportunities.
 - Optimize utilization of existing resources, tailor those existing resources to specific Landowner Conservation Association's needs, and more efficiently identify future challenges, needs of Landowner Conservation Associations like equipment, continued coordination, or continued membership drives to generate interest among new landowners for joining local associations.
 - Provide the regular face-to-face support for local Landowner Conservation Association meetings, coordinate local educational programs for associations in their region, and support grazing program outreach in local communities.
 - Work directly with landowners to determine what they need to meet membership goals and assess the uptake of recommended sustainable grazing practices.
 - Market the online learning technologies and point participants who have completed online training to their nearest relevant grazing or fire associations, helping them to become involved in the association.

Grant funded. Continued employment in this position is contingent upon availability of funds.

All positions are security-sensitive. Applicants are subject to a criminal history investigation, and employment is contingent upon the institution's verification of credentials and/or other information required by the institution's procedures, including the completion of the criminal history check.

Equal Opportunity/Affirmative Action/Veterans/ Disability Employer.



REQUIRED QUALIFICATIONS & ATTRIBUTES

REQUIRED EDUCATION & EXPERIENCE:

- Bachelor's degree of equivalent combination of education and experience.
- Four years of related experience.

REQUIRED KNOWLEDGE, SKILLS AND ABILITIES:

- Knowledge of word processing, spreadsheet, and database applications.
- Ability to multitask and work cooperatively with others.
- Good verbal and written communication skills.

Please submit Cover Letter, CV/Resume, Transcripts, References & other documents.

Any questions, please contact Dr. Morgan Treadwell @ morgan.treadwell@tamu.edu



We are looking for a talented Livestock Grazing Coordinator with experience and expertise in patch burn grazing and pyric herbivory concepts to join our team!

- This position is grant funded
- Located in Stephenville, Texas

Check out the link below for more information!

[View Application](https://www.tx.ag/GrazingCoordinator)

Agents of Change!

This project is building on our Prairie Project and is a

Climate-Smart Practices for Sustaining Great Plains Rangelands

A CLIMATE HUB PARTNERSHIP

AGENTS OF CHANGE

Recruitment

We are recruiting one cohort of educators and natural resource professionals as agents of change. The participants role will be to develop, implement, and disseminate high-impact educational outreach resources and programming. The objective of the agents of change is to increase climate awareness and to promote adoption and public support of climate-smart agricultural practices in the Great Plains rangelands.

Participation

Attend a 5-day intensive summer workshop to study the current science on climate risks, climate-smart practices, and current pedagogies for effective engagement, visit research and demonstration ranches, and design a learning module or outreach activity with an assessment plan. During the following Fall and/or Spring, participants will implement and assess the learning module or outreach activity in their own classroom or outreach programming. Upon completion of cohort projects, participants may be invited to join the project team in conducting workshops or organized sessions at professional meetings and Extension programs to engage peers.

Support

Cohort participants will receive a \$2000 stipend and be reimbursed for travel expenses for the summer workshop. There will be monthly online meetings where participants can engage in discussions and receive feedback from the project team and fellow cohort participants. Participants will also have regular individual consultations with designated facilitators of the project team to discuss implementation and assessment throughout the year.

Applications will be accepted until February 7, 2025



The Great Plains region is the center of the nation's livestock production, but its sustainability is threatened by increasingly frequent and intense droughts and wildfires, which are associated with climate change and woody plant encroachment. This Climate Hub Partnership project is an integrated extension and education effort to promote adoption and public understanding of climate-smart practices, such as pyric-herbivory and multi-species grazing in the Great Plains rangelands.



APPLY HERE:



tcag111824

FOR QUESTIONS, CONTACT:

Melissa Shehane, Ph. D.
melissa_shehane@ag.tamu.edu

collaboration among TAMU, OSU, UNL, and the USDA-ARS Southern and Northern Plains Climate Hubs. We are looking for highly motivated individuals with a strong interest in increasing climate awareness and promoting climate-smart land management practices such as pyric-herbivory and multi-species grazing.

If you think any of your colleagues who may be interested in this opportunity, would you please share the attached flyer with them and encourage them to apply? We will start reviewing applications in early December and will be accepting applications until February 7, 2025.

For more information be sure to contact Dr. Melissa Shehane.

melissa.shehane@ag.tamu.edu

We are recruiting a cohort of twelve (12) educators and natural resource professionals as “agents of change” for a USDA-NIFA funded Climate Hub Partnership project.

Great Plains Fire Summit Recap!

Our Great Plains Fire Summit in August was a huge success!

We had participants from:

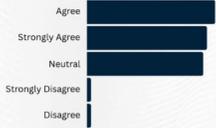
- North Dakota
- South Dakota
- Nebraska
- Kansas
- Oklahoma
- Texas

Over 250 participants attended from over 50 various state and federal agencies, non-profits, private ranches and universities!

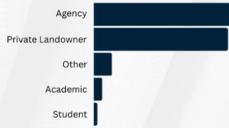


The 4th Great Plains Fire Summit was held as an effort to unite stakeholders who implement, respond, and regulate wildland and prescribed fire in the Great Plains and to share knowledge, build partnerships, and improve communication.

THE SUMMIT INCREASED MY COMFORT WITH USING PRESCRIBED FIRE.



PARTICIPANT DEMOGRAPHIC



250 PARTICIPANTS - 78 ZIP CODES REPRESENTED ACROSS THE GREAT PLAINS

PARTICIPANTS

- North Dakota, South Dakota, Nebraska, Kansas, Oklahoma and Texas were all represented within their respective prescribed fire and wildfire first responders programs and agencies.
- Over 250 participants attended from over 50 various state and federal agencies, non-profits, private ranches, and universities.

EXPERIENCES

- A 1,000-ac demonstration prescribed fire was implemented for participants by the JA Ranch in Clarendon, TX.
- Texas Parks and Wildlife showcased equipment and technology they rely on during prescribed fire operations and wildfire response at the state parks.

This work is supported by the USDA National Institute of Food and Agriculture Rapid Response to Extreme Weather Events Across Food and Agriculture Systems (A1712) program area priority project award no. TEXN0022, from the U.S. Department of Agriculture's National Institute of Food and Agriculture.

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and should not be construed to represent any official USDA or U.S. Government determination or policy.



Getting to the Root of it!

THE QUESTION:
The influence of plant-soil feedbacks are well known, however the impact of individual environmental factors on PSF interactions has been rarely examined. So to what degree, if at all, does fire affect PSF in woody legumes, and what does that mean for the Texas landowner?

A 2022 study answered this question by comparing soil microbial communities under living woody legumes, collected both within and outside of a burned area.

Effect of fire on soil biota was most well documented to be found within 3-CM of soil surface

MUTUAL SYMBIOSIS:
LEGUME SHARES CARBON
RHIZOBIA FIX NITROGEN
*These rhizobia live in root nodules formed by the legumes.

The study indicates that:
FIRE MAY REDUCE PSF BY WEAKENING A PLANT'S ABILITY TO FORM THESE NODULES.

Biomass and number of nodules are POSITIVELY CORRELATED
Meaning that fires can lead to decreased biomass of legumes growing in burned soil.

Warneke, Christopher R., et al. "Hawaii Volcanoes National Park plant-soil feedbacks and fire data." U.S. Geological Survey data release, (2022.)

Interactions between plants and soils, plant-soil feedbacks (PSFs) are widely known to influence patterns of plant diversity at local and landscape scales.

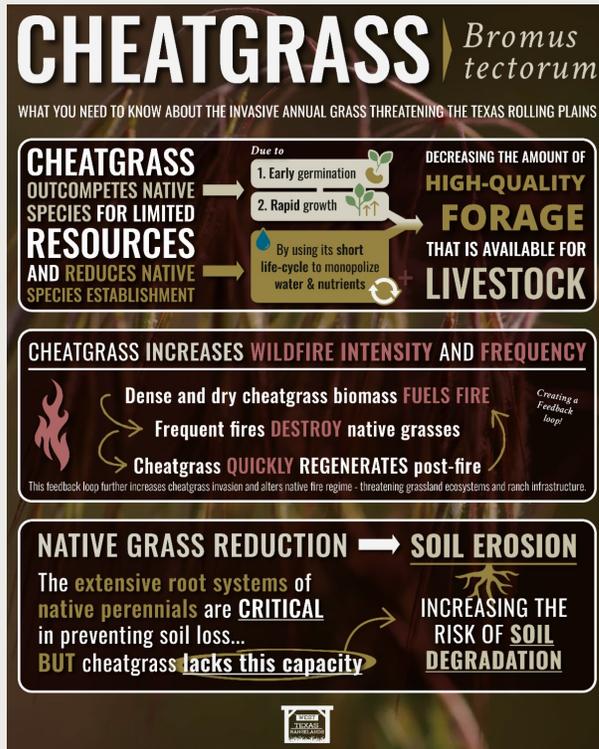
Missed this event? Be on the lookout for it in 2026!

However, these interactions are rarely examined in the context of environmental factors.

Prescribed fire is an environmental factor that alters microbial communities (Pourreza et al. 2014, Hedo et al. 2015, Prendergast-Miller et al, 2017). Prior to the study below, the influence of fire on PSFs was unexamined. Does fire affect PSF in woody legumes and what does it mean for Great Plains Area landowners? This study helped to answer this question by comparing soil microbial communities under living woody legumes, collected both within and outside of a burned area.

For more information and the full study, be sure to read it here - **Soil Feedback**

Cheatgrass in the Lower Texas Rolling Plains!



What is Cheatgrass? Cheatgrass (*Bromus tectorum*), is an invasive annual species. This species poses a significant ecological threat to the Southern Great Plains of Texas, particularly in the Rolling Plains Region. Cheatgrass will displace native grasses such as sideoats grama (*Bouteloua curtipendula*), blue grama (*Bouteloua gracilis*) and little bluestem (*Schizachyrium scoparium*). These dominant, perennial, native grasses are key to maintaining soil stability, biodiversity, and forage quality (D'Antonio & Vitousek, 1992; Chambers et al., 2014).

How does cheatgrass outcompete native grasses? Cheatgrass has an early germination and a rapid growth. Due to these two aspects, it outcompetes the native species for the limited resources available. Cheatgrass also completes its life cycle before native grasses begin to thrive and opportunistically monopolizes the water and nutrients in the soil (Bradford & Lauenroth, 2006). This process reduces overall biodiversity and quantity of high-quality forage available for livestock to graze.

Cheatgrass also dramatically alters the fire regime by increasing the frequency and intensity of wildfires. This is due to its dense and dry biomass that becomes rapidly available as fuel for fires. Cheatgrass is fire-adapted and can quickly regenerate after a fire.

For more information, be sure to check out [Cheatgrass Invasions](#) and data co-authored with USDA-NRCS Rangeland Management Specialist – Matthew Coffman.

Blue Grama (*Bouteloua gracilis*)!

It takes more than just quantity, but quality too! And blue grama, hairy grama, and buffalo grass are some of the most nutritious of all native grasses in mixed prairie holding crude protein

BLUE GRAMA

BLUE GRAMA HISTORY

Great multiplication of grass species between early tertiary periods (66mya) and the pleistocene (the "ice age", 2.6 mya.)

An expanding winter climate during the ice age results in mass movement of plants and animals south over thousands of years

After glaciers receded following a warm dry spell, blue grama made their way from their origin point on the Mexican plateau to as far north as dry south hillsides along Saskatchewan near Edmonton, Canada

25 STATES | MEXICO | 5 CANADIAN PROVINCES

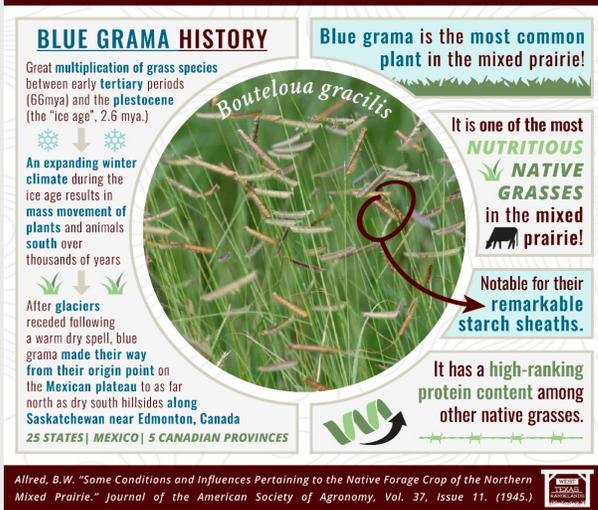
Blue grama is the most common plant in the mixed prairie!

It is one of the most **NUTRITIOUS NATIVE GRASSES** in the mixed prairie!

Notable for their remarkable starch sheaths.

It has a high-ranking protein content among other native grasses.

Bouteloua gracilis



Allred, B.W. "Some Conditions and Influences Pertaining to the Native Forage Crop of the Northern Mixed Prairie." *Journal of the American Society of Agronomy*, Vol. 37, Issue 11, (1945.)



levels well into dormancy. Their leaves are notable for their remarkable starch sheaths and the peak protein content ranks high along with dominant warm season tallgrasses like yellow indiagrass.



As stewards, let's all just take a Christmas moment reflection and a deep breath of blue grama. Did you know that blue grama is the most common plant found throughout the mixed prairie? Even more impressively, blue grama possesses the most general distribution thriving as far north as Canada and as far south as Mexico.

For more information, be sure to check out the full publication [Some Conditions and Influences Pertaining to the Native Forage Crop of the Northern](#)

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