Turfgrass Science and Management

University of Nebraska-Lincoln

Program Update

2024

The University of Nebraska-Lincoln (UNL) Turfgrass Science and Management program is dedicated to advancing turfgrass education, outreach, and research to serve the needs of the turfgrass industry. Our dedicated team conducts basic and applied research to optimize management that reduces inputs and costs while promoting a healthy turf system. We collaborate with industry to test new products and deliver content representing the future of optimized turfgrass management practices.

We are fortunate to also have a skilled extension team that translates research into practical recommendations for professional turfgrass managers. Information is broadly shared through conferences, turf publications, our webpage (turf.unl.edu), and through social media. We also support professional development training opportunities through continuing education credits and cooperating with the Nebraska Department of Agriculture to make annual pesticide recertification training accessible to our professionals. We offer strong extension programming to help our clientele whenever they encounter turfgrass production or management problems.

We pride ourselves on educating the next generation of turfgrass industry professionals through our undergraduate program. Our graduates are hired into relevant industry positions in turfgrass management, production, sales, and research and development fields. We sustain more than 20 students annually that are competitive at turf quiz bowl competitions and maintain an active student club. We are indebted to our industry partners for providing internship opportunities, site visits, interview experiences, and scholarships to our students, enriching their experience while at UNL.

Our industry partners also support our research and extension programs. The Nebraska Turfgrass Association, Nebraska Golf Course Superintendents Association, Nebraska Sports Field Managers Association, and United States Golf Association along with several industry partners provide financial assistance, access to products, equipment, and facilities allowing us to pursue industry relevant projects. This is in addition to the support we receive from the University that sustains our program.

Our success is built on the strength of our partnerships, and we are so very fortunate for our sustained industry support. This report provides highlights of some of the projects that were completed or are ongoing over the past year that were supported in-part by these partnerships.

Sincerely,

Keenan Amundsen, PhD
Turfgrass Geneticist

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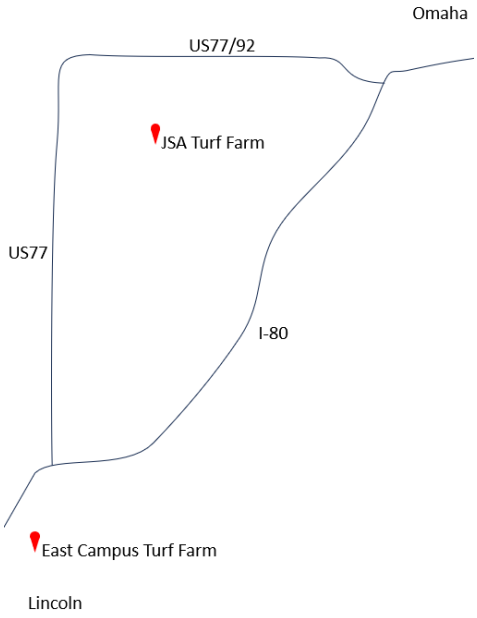
Facilities

John Seaton Anderson Turfgrass Research Facility



The John Seaton Anderson (JSA) Turfgrass and Ornamental Research facility located at 1165 County Road 9 near Mead, NE was the primary University of Nebraska-Lincoln turfgrass research facility for nearly four decades, facilitating essential field research supporting the turfgrass industry. The facility is still in use and has more than 50 acres of irrigated turf plots, with golf course putting greens, fairways, and rough/lawn areas managed with different inputs with data collected regularly in support of ongoing research projects.

East Campus Turf Farm

The East Campus Turf Farm opened in 2015 and now has more than 7 acres of irrigated turf research. This location has better water quality, supports student learning, reduces travel costs to JSA, and beautifies the north entrance to East Campus. The facility is maintained with dedicated solar panels and a wind turbine to generate enough power to run small hand tools and the irrigation controller. The facility is home to our research that requires intensive evaluation or management inputs, including three NTEP trials, athletic field trials, pest management studies, tine cultivation best practices, traffic, buffalograss evaluation trials, and many more.

Personnel

Faculty and Staff

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Anne Streich, Professor of Practice, astreich2@unl.edu, 402-472-1640

Graduate Students and Postdocs

Kristina Alas, PhD student, Application of breeding models for dioecious crop improvement

Krishna Ghimire, Postdoc, Water deficit evaluation and QTL analysis in bentgrasses and danthonia species

Michael Morikone, PhD, Optimizing genome annotation with convolutional neural networks

Research Projects

Buffalograss germplasm evaluation

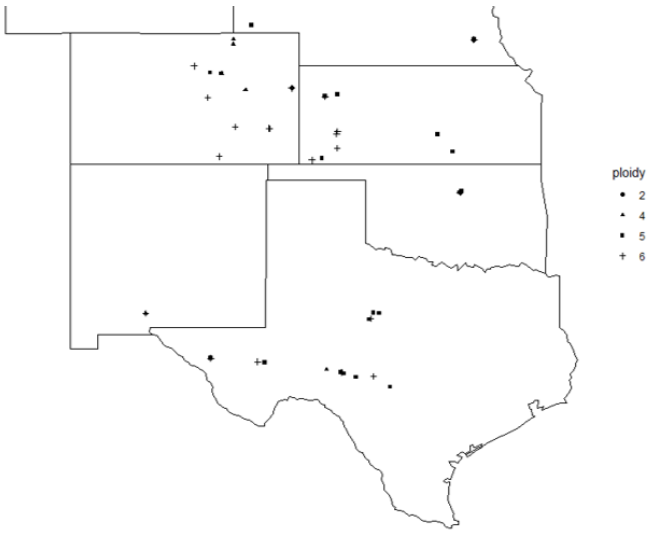
Diverse germplasm is an important component of any breeding program as it is the source of new traits that can be introduced into elite buffalograss lines through plant breeding. The material represents an early stage of the breeding program, where new lines are collected and maintained at our research farms. Once established, the material is evaluated for several seasons to determine their suitability as a turfgrass in our region.

Objective

Identify and introduce new buffalograss germplasm into our breeding program. Evaluate performance of south and central Great Plains collected buffalograss genotypes in eastern Nebraska.

Study

Our most recent and significant collection represents 151 buffalograss genotypes collected by former graduate student Collin Marshall from Colorado, Kansas, Nebraska, New Mexico, Oklahoma, and Texas.



Progress

The material has been evaluated for three seasons for visual quality, spring greenup, density, texture, genetic color, onset of winter dormancy, gender expression, and ploidy (map shows distribution of buffalograss lines based on their ploidy level). Several selections have been made from this material that have been advanced to other germplasm evaluation trials and new replicated studies designed to evaluate their performance as a turf and their potential use for seed or vegetative plug or sod production.

Buffalograss advanced breeding lines

Top performing individuals from germplasm evaluations are further evaluated in larger plots and managed as a turf. Best selections are advanced as potential vegetative lines or as parents for new seeded lines.

Objective

Evaluate multi-year performance of advanced buffalograss selections for potential use as a turf, parents to create new breeding lines, and seed and vegetative line production.

Study

The experiment is designed as a randomized complete block design with three replications and each plot is evaluated for visual quality, spring greenup, density, texture, genetic color, onset of winter dormancy, gender expression, and ploidy. The study is designed with 37 buffalograss selections and 2 cultivars for comparisons ('Prestige' and 'Legacy' buffalograss). This study is designed to observe longterm persistence of buffalograss. We will select individual genotypes that perform among the best after these multi-year evaluations.

Progress

From this research we identified lines suitable to use as parents in crossing blocks (special breeding blocks designed to intermate certain genotypes), and lines with exceptional quality, texture, establishment rate, and color retention.

Buffalograss elite line evaluation

NE-BFG-07-3452-58	CB	NE-BFG-05-2974	P,LS	NE-BFG-11-3611	SH
NE-BFG-09-3498	SH	NE-BFG-07-3453-35	FS	NE-BFG-07-3454-61	CB
NE-BFG-09-3524	SH	NE-BFG-07-3459-17	LS	NE-BFG-05-3000	LS
NE-BFG-09-3523	SH	NE-BFG-11-3611	SH	NE-BFG-07-3462-58	FS
Sundancer	SE	NE-BFG-07-3453-67	FS,LS	NE-BFG-05-3010	FS

SH Shade tolerance
P Persistence
CB Chinch bug resistance
FS False smut resistance
LS Leaf spot resistance
SE Standard Entry

Objective

Evaluate and advance buffalograss populations derived from parents that have exceptional shade tolerance, leaf spot resistance, stand persistence, chinch bug tolerance, and disease resistance. Each trait is important for buffalograss cultivars.

Study

Advanced buffalograss breeding populations were grown in a non-replicated study design in 10' x 10' plots. Buffalograss 'Sundancer' was used for establishment comparisons.

Progress

Populations were derived from parents that had exceptional stand persistence from multi-year trial evaluations, or had resistance/tolerance to shade, chinch bugs, leaf spot disease, or false smut disease. Seed yields were monitored for the 14 experimental populations and five high yielding populations were advanced to evaluation trials designed to determine if lines are suitable for commercial production. Sundancer was destroyed following initial establishment evaluation and performance comparisons. The remaining plots were isolated and allowed to intermate. Seed was harvested in 2023 and 2024 and is being advanced to create new breeding populations.

Buffalograss seed dormancy

Like many native prairie grass species, buffalograss has strong seed dormancy. The response helps it survive in environments exposed to extensive drought, heat, or even fires. Seed dormancy is broken by a potassium nitrate post-harvest seed treatment (burs are often dyed green indicating they have been treated).

Objective

Develop buffalograss lines that have reduced seed dormancy to improve seed quality.

Study

Fourteen elite buffalograss populations were established without seed treatment. Exceptional male and female lines from each population that germinated quickly (within 14 days) were selected.

Progress

Selected male and female lines were vegetatively propagated and replicated in the greenhouse. The replicates for each genotype were planted in rows. Each row was evaluated for uniformity and compared to other rows from the same source plot to determine family uniformity and to establish crossing blocks to further advance the genetics.

Populations that have exceptional uniformity and visual quality will be allowed to intermate and advanced to subsequent generations. Each generation will be planted directly in the field without a post-harvest seed treatment. Selections will be made for genotypes that germinate without the seed treatment and that have desirable traits.

Buffalograss for sod production

Our turfgrass breeding program is developing turf-type buffalograss with improved visual and functional quality, pest resistance, color retention, establishment rate, sod strength, and traits important for seed and sod production. Sod strength is an important characteristic for sod producers but is also an important attribute of a successful buffalograss turf because it is closely associated with stolon numbers, their density, length, and canopy architecture.

Objective

Identify top performing buffalograss lines to advance for sod production.

Study

Advanced buffalograss breeding lines (n=24) and two industry standard cultivars ('Prestige' and 'Legacy') were plugged at 12" spacing into the field in a randomized complete block experimental design with three replications.

Progress

Establishment rate (1 month post planting), visual quality, spring green-up, and sod strength (2 measurements) were evaluated. Transplant shock and recovery and regrowth after cutting sod were evaluated. Several lines performed as good as or better than the commercial lines for all of the traits evaluated.

Buffalograss seeded diploids

Buffalograss has a strong winter dormancy response. From a sustainability perspective, there is no need to irrigate, mow, or fertilize dormant buffalograss, but from a functional turf perspective, the straw color is not desirable and dormant buffalograss does not recover from damage. Diploid buffalograss does not have a strong dormancy response and has potential to retain its color longer into the fall when not grown in regions with harsh winters (drought impacted areas of California and Texas for example). There are currently no commercial seeded diploid buffalograss varieties.

Objective

Develop and advance separate seeded diploid buffalograss populations and increase seed for turf performance evaluation trials.

Study

Male and female diploid lines were selected for flower production and aggressive growth. Selections were propagated and established in the field in two separate 1,000 sq ft plots. Each plot was planted in quadrants of females surrounding by males.

Progress

Seed was bulk harvested from each plot and used to establish 10,000 sq ft plots in isolation. Resultant seed will be used for regional evaluation trials. Seed yield and germination will be determined following subsequent harvest giving an indication of suitability of the new lines for commercial production.

Buffalograss management

Seed producers reported reducing buffalograss seed yields over time, problematic when buffalograss seed production fields are in production for more than a decade. There is some speculation that this observation may be caused by soil acidification, intra specific competition, or increasing fertility needs which would negatively impact seed production over time.

Objective

Determine if nitrogen source or lime applications increase seed yield over time.

Study

Non-replicated evaluation trial. Each plot is 5' x 30', designed so we can split additional treatments as necessary. Entire study received three applications of 40# nitrogen per acre annually with additional treatments applied per acre as described below.

1. 60# N Urea, 200# 11-52-0, 300# pel lime
2. Control
3. 60# N AMS
4. 60# N Urea
5. 300# pel lime
6. 200# 11-52-0

Progress

Visual quality, seed yield (seed weight), and forage yield have been measured per plot for two years. Visual differences for color are clear in above image. Yields in plots receiving higher supplemental nitrogen increased and the increased harvest value outweighed the nitrogen costs.

NTEP Tall Fescue

The National Turfgrass Evaluation Program (NTEP) coordinates several species and variety trials throughout the country. We were selected as a test site for the multi-year 2024 National Tall Fescue test. Tall fescue is our dominant lawn species used throughout the region. Be sure to visit the NTEP plots during your visit to our research field day in the summer.

Objective

Evaluate new and experimental tall fescue lines relative to industry standard entries under reduced irrigation inputs in the central Great Plains region.

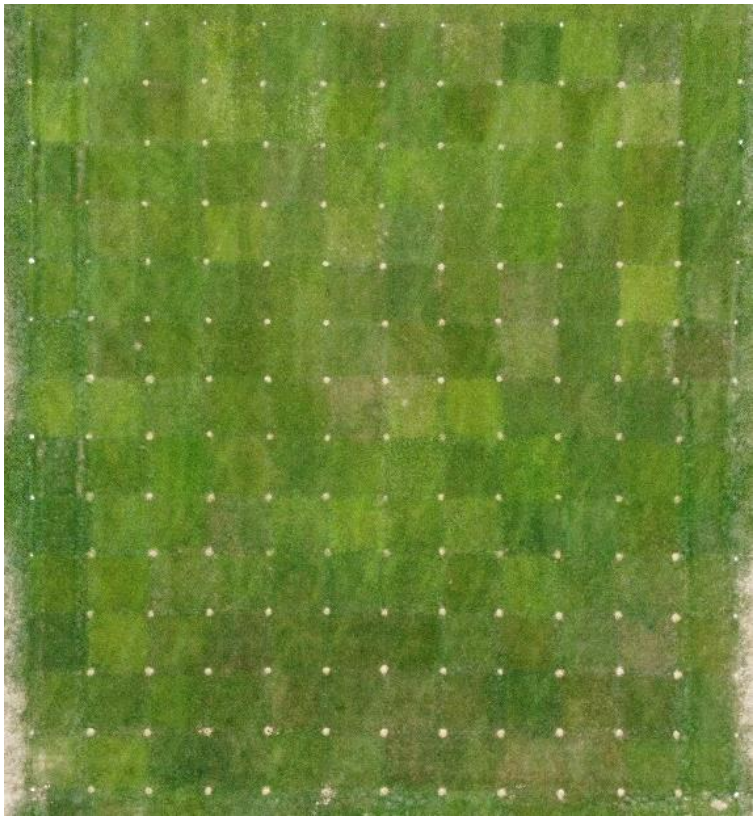
Study design

The study is arranged as a randomized complete block design with three replications and maintained at a three-inch mowing height. The study includes 108 tall fescue lines including six standard entries.

Progress

The study was established in September 2024. This is an ancillary trial (not a standard tall fescue test) and will be managed at reduced irrigation inputs. We are targeting an initial irrigation level of 60% weekly ET replacement but will increase as necessary to prevent stand loss. Data will be collected for establishment rate, genetic color, spring green-up, fall color retention, canopy density, texture, and visual quality.

NTEP Kentucky Bluegrass



The National Turfgrass Evaluation Program (NTEP) coordinates several species and variety trials throughout the country. We are a test site for the multi-year 2023 National Kentucky Bluegrass test. Kentucky bluegrass is an important turf species used throughout the region in lawns and athletic fields.

Objective

Evaluate new and experimental Kentucky bluegrass lines for performance in the central Great Plains region.

Study

The study was established in September 2023 and arranged as a replicated complete block design with three replications. There are 56 entries maintained at a 2.5 inch mowing height under evaluation.

Progress

Each Kentucky bluegrass plot was evaluated for genetic color, spring green-up, leaf texture, visual quality per month of the growing season, fall canopy density, and establishment rate. This year marked the first full year of the study and data has been submitted to NTEP. Once processed, data will be made publicly available through the NTEP website (https://www.ntep.org/). Keep in mind that data is available for several sites, so if there is a trait you are interested in that was not evaluated in Nebraska, be sure to explore some of the other state reports.

NTEP Perennial Ryegrass

The National Turfgrass Evaluation Program (NTEP) coordinates several species and variety trials throughout the country. We are a test site for the multi-year 2022 National Perennial Ryegrass test. Perennial ryegrass is an important turf species used throughout the region in lawns and athletic fields and is highly regarded for its rapid germination.

Objective

Evaluate new and experimental perennial ryegrass lines for performance in the central Great Plains region.

Study

The study was arranged as a randomized complete block design with three replications. It was established in September 2022 and maintained at a two-inch mowing height. There are 83 entries, including five standard entries.

Progress

Each perennial ryegrass plot was evaluated for genetic color, spring green-up, visual quality per month of the growing season, and establishment rate. Early data for this study is available through the NTEP website (https://www.ntep.org/). Keep in mind that data is available for several sites, so if there is a trait you are interested in that was not evaluated in Nebraska, be sure to explore some of the other state reports.

Kentucky bluegrass traffic tolerance

Kentucky bluegrass is an important species used on athletic fields and, as such, traffic tolerance is critically important.

Objective

Evaluate genotype-related surface firmness following traffic applied to the 2017 NTEP Kentucky bluegrass test

Study

The study was arranged as a split randomized complete block design with 3 replications. Traffic was applied with a modified Brinkman traffic simulator fitted with bolts and towed behind a Toro Workman. Traffic was applied weekly in two directions to half of each plot. The main plots were either trafficked or not and the sub-plots were the 89 Kentucky bluegrass entries from the 2017 NTEP Kentucky bluegrass test.

Progress

Traffic was applied and three plot surface firmness measurements were taken using a Clegg Impact Hammer. Visual quality and firmness differences were observed for the evaluated genotypes.

Tine cultivation and sand incorporation study

Objective

Evaluate pre- and post- tine cultivation sand incorporation as impacted by tine type.

Study

The study was arranged as a split plot randomized complete block design with three replications. Each plot measured 14 ft by 4 ft. Treatments were applied using a Toro Procore 648 with a 48" swath.

Main Plots (42' X 60' with a 6' border between)

1. Topdress before tines with 0.25" on surface (equates to 1 ton/1000 ft^2 or 20 ft^3/1000ft^2)
2. Topdress after tines

Sub-plots (tine treatments) set at 3-3.5" depth

1. 5/8' X 6" Viper Nose™ Quad 3/4" Mount (2600 RPM 2 ring on top setting 648)
2. 1/2" X 6"Viper Nose™ Quad 3/4" Mount (2600 RPM 2 ring on top setting 648)
3. 3/8 inch tine (4 ring on top setting 648)
4. Talon Tine 1/2" x 6", 3/4" Mount (2 ring on top setting 648)
5. 108-9198 TITAN SOLID ROUND 4.50" .25" OD (5 ring on top setting 648)
6. 108-9202 TITAN SOLID ROUND 4.50" .50" OD (5 ring on top setting 648)
7. 108-9170 SIDE EJECT MAX 4.75" .28" ID (5 ring on top setting 648)
8. 108-9221 TITAN CROSS 4.50" – .50"OD (5 ring on top setting 648)
9. 108-9239 TITAN SOLID SLICING 4.50" .75" OD (5 ring on top setting 648)
10. 108-9161 SIDE EJECT 4.75" .53" ID .66" OD (5 ring on top setting 648)
11. 114-0551 TITAN HOLLOW EXT. TAPER 5.75" .53"ID .66" OD (2 ring on top setting 648)
12. DryJect 3X3
13. Untined Control
14. DryJect 2X3

Data Collection

- 24-48 hrs after treatment sample for OM with ¾" sampler; sample 0-1", 1-2", 3-4", 4-5" sampled monthly.
- 24-48 hrs infiltration with single ring infiltrometer, sampled monthly.
- TDR weekly after nighttime irrigation; 2 depths.
- Quality 1-9 weekly; 1=Unacceptable, 6= acceptable.
- Cultivation recovery visual estimate weekly. Scale 1-9 as a percentage recovery.
- Digital image of "pie" slice sampler to include aeration hole; weekly for 3-6 weeks. Take a sample near edge of plot.
- GS3 or green speed weekly starting 3-4 days post treatment.

Wetting agents study

Objective

Evaluate wetting agent longevity with dry-down periods promoting localized dry spot.

Study

The study was arranged as a randomized complete block design with four replications. Each plot was 5 ft x 10 ft. Treatments (water control or two wetting agents) were applied monthly from August through November. After treatment, plots were dried to wilting, evaluated, and then rewetted before starting the dry down again for two dry down cycles between each application.

Data Collection

Volumetric water content at multiple depths, visual quality, visual estimation of recovery, green speed, and surface firmness were measured 3-5 days post each dry down event.

Consumer Seeding Evaluation

Objective

Objective 1: Determine establishment and quality of a random sample of cool season turfgrass mixtures available to consumers.

Objective 2: Determine if the use of mesotrione at seeding influences establishment and quality.

Study

The study was arranged as a randomized split block design with 3 replications. There were 12 entries and 2 mesotrione treatment (with or without). Each plot measured 5 ft by 5 ft.

Progress

The study is complete, but the plots are maintained to see the long-term benefit of the early mesotrione application. See images and progression of turf performance on next page.

May - 40 Days after seeding

June - 65 Days after seeding

August - 125 Days after seeding

Yellow Nutsedge Evaluation with Akron Herbicide

Objective

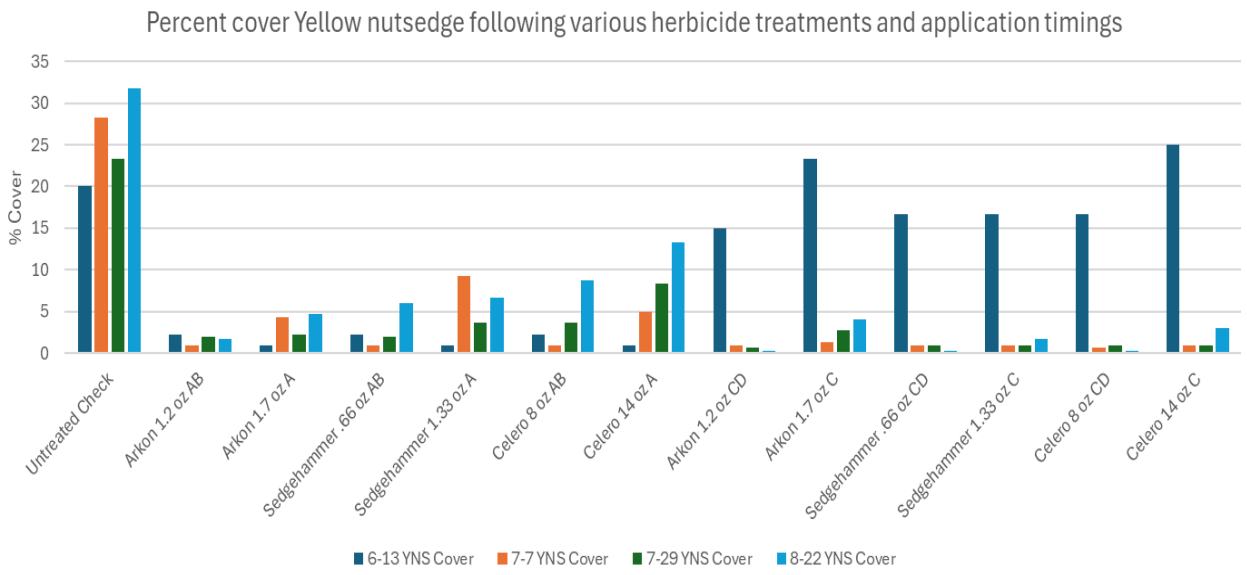
Evaluate new herbicide application timing with single or sequential applications.

Study

The study was arranged as a randomized complete block design with three replications. The study was done on a 3-year-old stand of turf-type tall fescue with yellow nutsedge (YNS) populations ranging from 5-20% cover at trial initiation. The stand of tall fescue was established over a high population of YNS tubers that were blended into the soil using a tiller (3 years prior at time of seeding) to ensure YNS occurrence. The stand was mowed at 2 inches and irrigated to prevent drought stress. Plots were 5 ft x 5 ft and sprayed with a CO2 backpack sprayer using a 3-nozzle boom with 8002vs nozzles at 30 psi. Treatments of Akron, Sedgehammer, or Celero were initiated at two separate timings with or without a sequential application starting on A=May 15th or C=June 13th (Table 3). At no time during evaluations did any of these products result in damage to the tall fescue. Visual YNS cover was measured.

Progress

All initial applications reduced YNS populations 29 days after treatment (DAT) resulting in 86-95% control . All treatments resulted in acceptable control with a few better than others on different rating dates, except the earlier application timing of Celero and Sedgehammer observed on the final rating resulting in lower control of 51-81%. Overall Arkon has good potential for YNS control observed on all ratings resulting in less than 5% YNS cover and 85-99% control across all treatments. Sequential applications appear to have better performance across all products compared to single applications. Arkon also resulted in good control with sequential applications in the early application timing and the later application timing when compared to other products that resulted in less control with the earlier application timing.



Canada Thistle Control in Native Areas

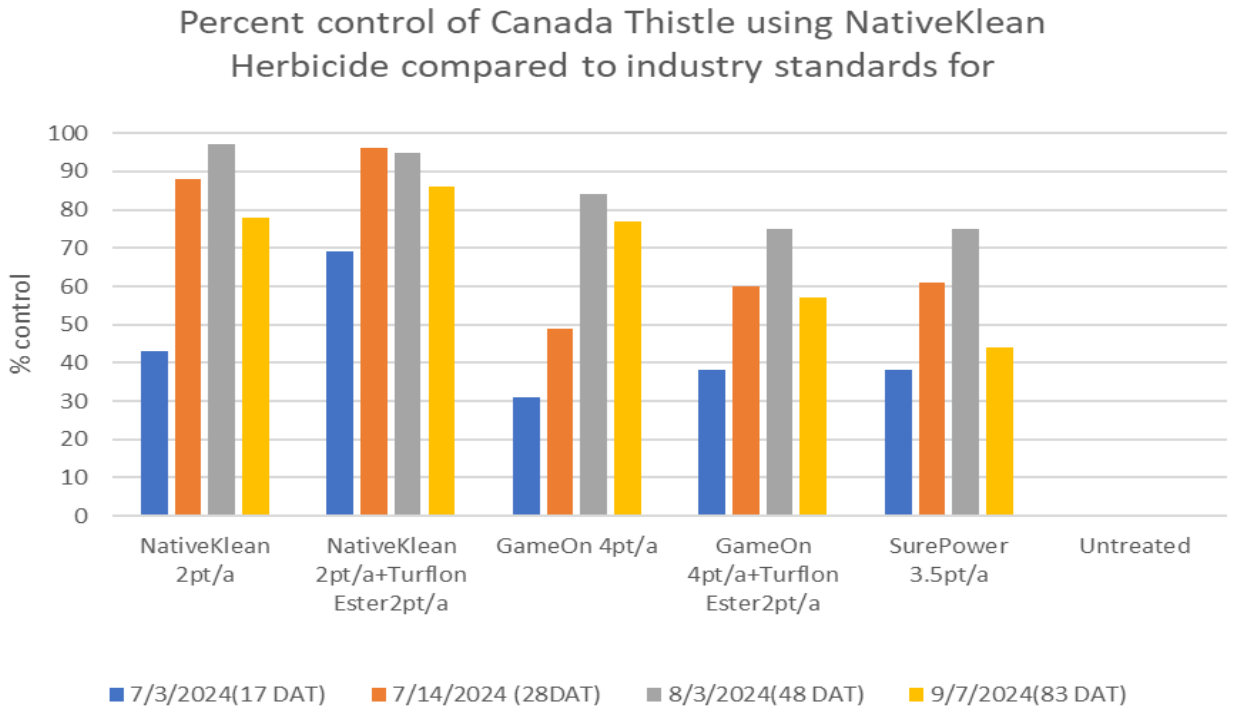
Objective

Compare NativeKlean Herbicide to industry standards for Canada Thistle control

Study

This study was done at the John Seaton Anderson Turf Research Center near Mead, NE on a 20-year-old stand of buffalograss and foxtail weed pressure with a high population of Canada thistle averaging 20-25% in all plots at the start of this study. The stand was unmown during the duration of the study and mown in the fall of the previous year. No supplemental irrigation was applied to this study. Plots were 5' x 5' and sprayed with a CO2 backpack sprayer using a 3-nozzle boom with 8002vs nozzles at 30 psi. Treatments were applied on June 16th. No negative effects were seen on buffalograss from these treatments throughout the duration of this study. The study was initiated in June 2023. Data collected include % injury to canada thistle, % cover & % control of canada thistle.

Progress



All treatments resulted in injury to Canada thistle at 6 days after treatment (DAT). Canada thistle cover was near 25% in all plots at the start of this study and was reduced to near 0 in the NativeKlean treatments at 28DAT. At the final rating on September 7th, both NativeKlean treatments and 4 pt/A GameOn had the lowest thistle cover ranging from 5-8% due to some regrowth that occurred after the 48 DAT. Those three treatments ranged from 77-85% control at the final rating.

In this trial NativeKlean has shown to be a great tool to help eradicate Canada thistle. Canada thistle can be very difficult to control with a single application due to its underground root system. The NativeKlean product use over multiple seasons could result in complete eradication. The addition of Turflon ester appeared to have an earlier advantage to controlling thistle but in the final rating this was not the case with minimal differences seen with its addition to the mix.

Bermudagrass Traffic Adaptation in Lincoln, Nebraska

Objective

Evaluate three different hybrid cold-tolerant bermudagrass cultivars with different overseeding applications and rate following traffic simulation.

Experiment Design

The study area is 50 ft x 108 ft and established to randomized strips of Tahoma 31, Latitude 36, and IronCutter bermudagrass. The area was managed using standard bermudagrass management with nitrogen fertilizer (0.5 to 1 lb per 1,000 sq ft) applied from July to September and irrigation applied as needed to prevent wilt. The area was mowed at 0.75 in two times per week. Traffic is applied perpendicular to the bermudagrass strips and simulated by a modified Toro ProCore 648 (right) with feet constructed of 9 total 0.5 in spikes per section (total of 6 sections). The spikes are like those used for the Husker Football student-athletes. Each traffic pass equals one traffic day of football. Plots were then seeded at different different rates of 0, 2, 5, or 10 lbs per 1000 sq ft. with HGT Kentucky bluegrass, SunRye perennial ryegrass, or no overseeding. Each seeding was split by seeding method (slit seeder or drop spreader). Seeding was initiated for some plots in July and others was delayed until August. Overseeding continued through mid-October.

Progress

Every 10 traffic days, data was collected for surface firmness (Gmax on Clegg Impact Hammer), shear strength (N*M), and normalized difference vegetation index (NDVI) on both traffic and no-traffic areas. Data collection continues until 94 traffic days or temperatures are consistently less than 32 degrees fahrenheit.

Kentucky Bluegrass Traffic Adaptation in Lincoln, Nebraska

The above image shows an HGT Kentucky bluegrass plot receiving traffic (left) or not (right).

Objective

Test traffic adaptation of HGT and 365ss Kentucky bluegrass blends in Lincoln, NE.

Study

Two 17 ft x 8 ft plots were established to either HGT or 365ss Kentucky bluegrass in May 2023. The plots were divided by traffic treatment (traffic or no traffic). Traffic was simulated with a modified traffic simulator.

Data Collection

Clegg Impact Hammer (Gmax) and Shear Strength Test (N*M) data were collected after 10 traffic days on both traffic and no traffic areas. Traffic timing was done in conjunction with the previously described Bermudagrass Traffic Adaptation study. Data collection continues until 94 traffic days or until temperatures are consistently less than 32 degrees fahrenheit.

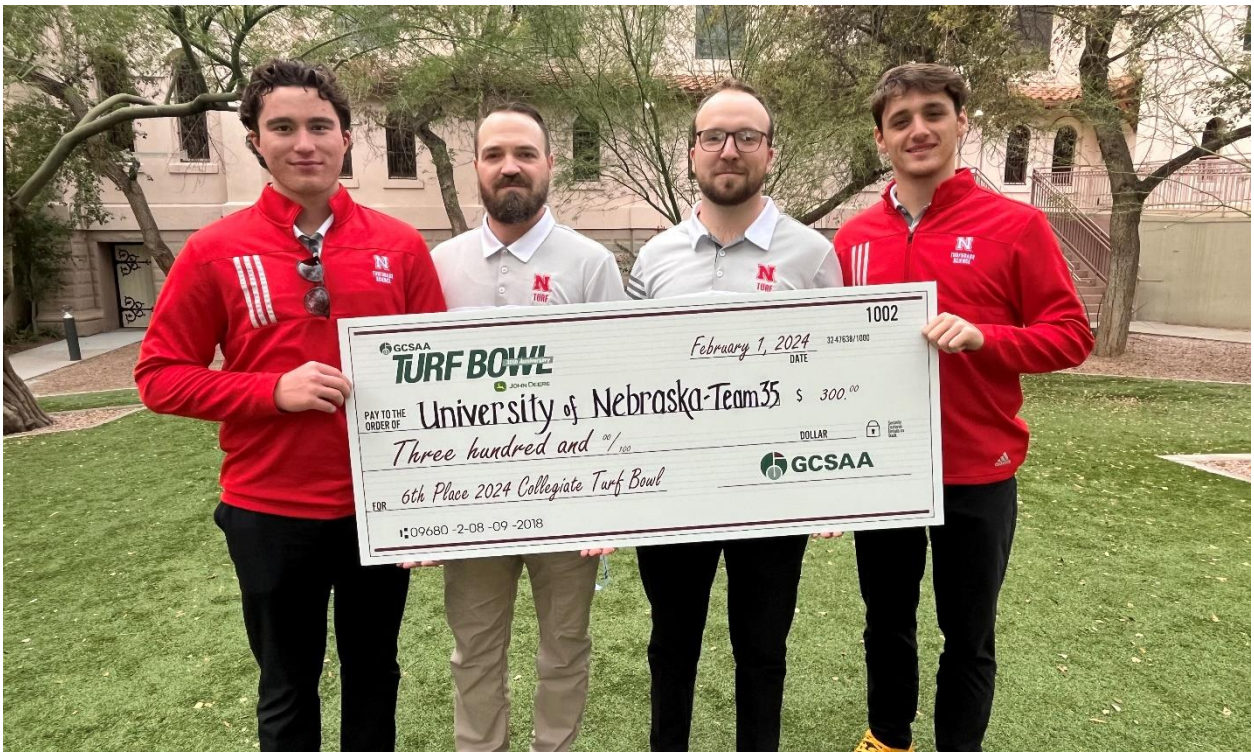
Education Program

Undergraduate Student Numbers

Fall enrollment for the Turfgrass Science and Management option of the Plant and Landscape Systems major was 27 students. Five of these students are dual majors with Professional Golf Management.

GCSAA Conference and Trade Show

Ten students attended the GCSAA Conference and Trade Show and competed in the GCSAA Turf Bowl in Phoenix, AZ. The teams placed 6th, 29th, and 30th, out of 63 teams. Topics covered in the competition include cool- and warm-season grass, weed, disease, insect, and seed identification; turfgrass growth and development; turfgrass management practices; soil fertility; pesticides and control methods; turfgrass mathematics; water management; and business management practices. At the Trade Show, students visited distributors and met with USGA Agronomists. The students also visited State Farm Stadium, home to the Phoenix Cardinals, and Mountain America Stadium, home of the Arizona State University Sun Devils football program. Instructor: Anne Streich.



Scout Allen, Alex Uram, John Tines, and Matt Boyd placed 6th in the Turf Bowl at the GCSAA Conference in Phoenix, AZ in February.

Students met with USGA Green Section employees at the tradeshow during the GCSAA Conference in Phoenix, AZ.

Students met with Andy Levy, Turf Director for the Arizona Cardinals.

Following the site visit at Mountain America Stadium in Tempe, the team climbed the 'A' Mountain or Hayden Butte.

Internship Experiences (PLAS 295 and 395T)

Students in the Plant and Landscape Systems major are required to complete two internships as part of their academic program. The list below includes locations of all student internships during 2024. Instructor: Anne Streich.

- American Family Field (Brewers), Milwaukee, WI
- Bandon Dunes Golf Resort; Bandon, OR
- Ballyneal Golf and Hunt Club, Holyoke, CO
- Beatrice Country Club; Beatrice, NE
- Crazy Mountain Ranch; Livingston, MT
- Fremont Golf Club; Fremont, NE
- Happy Hollow Club; Omaha, NE
- Luling Sport; Luling, TX
- Oakmont Country Club; Oakmont, PA
- Prairie Dunes Country Club; Hutchinson, KS
- Shooting Star Club; Teton Village, WY
- The Sand Box (Sand Valley); Nekoosa, WI

- TPC Deere Run; Silvis, IL
- The Lido (Sand Valley); Nekoosa, WI
- The Prairie Club; Valentine, NE
- Wilshire Country Club; CA
- Wrigley Field (Cubs); Chicago, IL

Domestic Study Tour (AGRI 311)

Ten students participated in the annual fall break trip to Kansas City to visit with industry professionals (director of agronomy/superintendents/turfgrass managers and golf professionals) about effective communication and challenges associated with each of their positions. The group included students from the Turfgrass Science and Management and Professional Golf Management programs. Site visits included ArborLinks Golf Club, Kansas City Country Club, Wolf Creek Golf, GEHA Field at Arrowhead Stadium, and Smiley's Golf Complex. Instructors: Anne Streich and Brad Goetsch.

Students along with Director of Agronomy and UNL Turfgrass Alumnus Kenton Fritson (second from left) at ArborLinks Golf Club in Nebraska City.

Students learn about the course renovation at Kansas City Country Club from Superintendent Patrick Rose, CGCS.

Students at Wolf Creek Golf Club in Olathe, KS learning about bank stabilization with Director of Agronomy and UNL Turfgrass alumnus Bill Irving.

Students learn about challenges associated with growing grass at Arrowhead Stadium with Turfgrass Manager Travis Hogan.

Other Courses

PLAS 227: Introduction to Turfgrass Management

Students gain an appreciation for the dynamic nature and complexity of managed turf systems. *Students are exposed to different sectors of the turfgrass industry; are able to identify common turfgrass species, problems associated with each and how to remedy those problems; and become knowledgeable of the primary cultural practices used by successful turfgrass managers*.

PLAS 229: Introductory Turfgrass Management Laboratory

The Introductory Turfgrass Management Laboratory is a hands-on course designed for sophomore turf students, as well as those in the Professional Golf Management Program. Through this course, students gain foundational skills essential for managing diverse turf environments, from golf courses and sports fields to home lawns and urban green spaces.

PLAS 327: Turfgrass Science and Management

This course explores the scientific principles of turfgrass physiology, species adaptation, establishment, management, relationships with soil, systems, and pest management. After completing the course, students understand how management, environmental factors, and grass species impact turfgrass growth and function.

PLAS 391T: Turf and Landscape Math

Turf and landscape professionals use applied math skills daily. Maintaining inventories, calculating areas and application rates, and tracking labor and costs are a few examples of common math used in the industry. The course demonstrates examples and methods for solving turf and landscape math problems. By the end of the course, students have the necessary skills and confidence to solve turf and landscape math problems.

PLAS 427: Turfgrass Systems Management Lecture and Lab

The course is a lecture and lab-based capstone course for senior turfgrass science major or minor students. The students develop an understanding for the diversity of various turfgrass systems (lawn care, sports fields, and golf courses), and how those different systems impact turfgrass management. Students develop management plans and visit several facilities to gain practical experience.

Superintendent Zach Caudillo (left) speaking to PLAS 427 students at Holmes Lake Golf Course in Lincoln, NE.

Outreach

University of Nebraska-Lincoln Turfgrass Field Day

The field day was held on Friday, July 19, at the East Campus Turfgrass Research Center in Lincoln. The morning session highlighted ongoing research projects and updates from across Nebraska on turfgrass-related concerns. The always popular hotdog lunch was provided, giving participants an opportunity to get a break while visiting the 14 sponsors present.

There was an afternoon tour at Hawks Field, Haymarket Park, home to the Lincoln Saltdogs and Nebraska Cornhuskers baseball teams. The field has won Field of the Year as the best collegiate baseball field at the 2003 and 2007 Sports Turf Managers Association. It is also a 23-time field of the year by the American Association (the league for the Lincoln Saltdogs).

There were 90 attendees at the field day this year. The goal for field day is to provide the context of the work being done for the turfgrass industry in Nebraska and support applied research to other departments and organizations at UNL with the turfgrass science program. More information on the Field Day, including digital handouts, is available here: https://turf.unl.edu/nebraska-turfgrass-field-day/.

Nebraska Turfgrass Conference

The Nebraska Turfgrass Conference (NTC) was held in LaVista, NE, from January 9 to 11, 2024 in partnership with the Nebraska Turfgrass Association (NTA). The annual conference provides current research and best management practices to address timely concerns by the industry. This year's conference was attended by 328 turfgrass industry professionals. An important part of the conference is pesticide recertification provided by UNL working with the Nebraska Department of Agriculture; pesticide recertification 114 participants.

Chase Straw Ph.D., Assistant Professor of Turfgrass Science at Texas A&M University, speaking at the 2024 Nebraska Turfgrass Conference.

Nebraska Sports Field Management Association (NESFMA)

The Nebraska Sports Field Management Association (NESFMA) was established in 2023. The NESFMA is the Nebraska state chapter of the National Sports Field Management Association (SFMA). They represent members who work in the related sports turf industry in the state of Nebraska including those working in athletic fields, parks and recreation, schools, universities, and professional playing surfaces.

NESFMA conducted two in-person field days during the year at athletic field facilities in Nebraska. The spring field day was hosted at Charles Schwab Field in Omaha, home of the Creighton Bluejays baseball team and the NCAA Division I College Baseball World Series on May 9, 2024. The fall field day was held at the Grand Island Parks and Recreation in Grand Island on October 16.

The NESFMA also provides a $1,000.00 scholarship to students pursuing a degree in Turfgrass Science. In 2023, Scout Allen, a Turfgrass Science student from the University of Nebraska-Lincoln, received the inaugural scholarship.

Nebraska Golf Course Superintendents Association (NGCSA)

The Nebraska Golf Course Superintendent Association (NGCSA) is the Nebraska chapter of the Golf Course Superintendent Association of America (GCSAA). The NGCSA held a symposium on December 4-5. UNL collaborated with the NGCSA and the Nebraska Department of Agriculture to providing pesticide recertification.

Social Media with Nebraska Turfgrass Science

Starting in February 2023, the Nebraska Turfgrass Science X (formally known as Twitter) has been used as an outreach resource for the UNL Turfgrass Science program. Through X, information is shared on updates from the turf.unl.edu website, highlights of work done with the UNL Turfgrass Science undergraduate students/alumni, and UNL Turfgrass Science faculty and staff, and events related to the program. YouTube is also used by our program (https://www.youtube.com/@unlturfgrass). The channel, as of November 21, has 361 subscribers. Content currently on the channel is focused on segments in Backyard Farmer and related video content with UNL Turfgrass Science faculty and staff.

turf.unl.edu Website

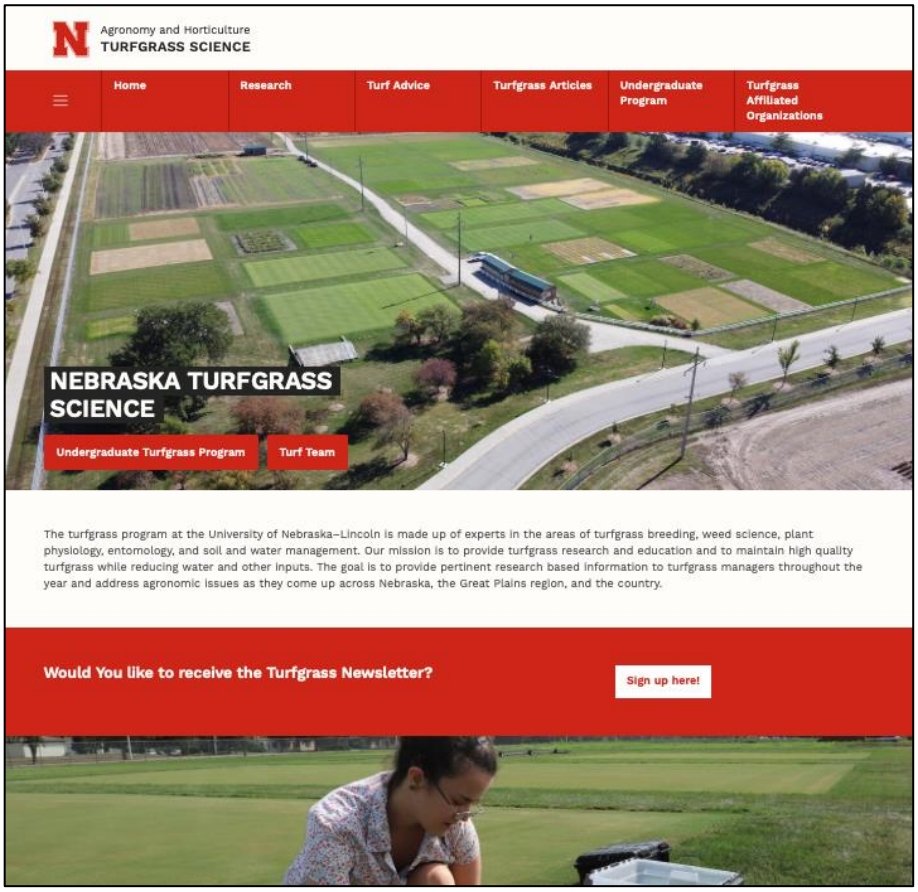


Figure 1. Title page of turf.unl.edu website.

The website for the UNL Turfgrass Science Program has recently completed migration to a new content management system. While the website is familiar, there are many changes in the way content is added to the website. It includes less coding in the information behind the scenes which will allow us to share information more efficiently. Recently added to our website is a link to a newsletter where you can join with your email address. The Turfgrass Newsletter will share current information on our UNL turfgrass science program and updates to the turf.unl.edu website.

Additional resources

Turfgrass Weed Control for Professionals

The Turfgrass Weed Control for Professionals is a regional collaboration with the North Central Turfgrass and the Environment group that provides results and updated management strategies for the various weeds in turfgrass areas. The publication is led by Purdue University, and we collaborate to provide Nebraska-specific information. The publication is updated annually and is one of the most comprehensive publications on common weeds and their management. The publication is

available in PDF ($12), physical copy ($20), or both PDF and physical copy ($26) at https://mdc.itap.purdue.edu/item.asp?Item_Number=TURF-100.

Turf Fact Sheets & NebGuides

Turf fact sheets and NebGuides are available through UNL Extension and our website. Two recent Nebraska Extension publication updates include the Cool Season Lawn calendars for eastern and western Nebraska:

1. S Browning, J Fech, A Folck, & R Gaussoin (2023) Cool Season Lawn Calendar-Western Nebraska. Pages 1-2 in NebGuide (G2359). Lincoln, NE: Nebraska Extension. https://extensionpublications.unl.edu/assets/pdf/g2359.pdf
2. S Browning, J Fech, A Folck, & R Gaussoin (2023) Cool Season Lawn Calendar-Eastern Nebraska. Pages 1-2 in NebGuide (G2356). Lincoln, NE: Nebraska Extension. https://extensionpublications.unl.edu/assets/pdf/g2356.pdf

With the transition to the new content management system, many of our former publications need to be updated so they are compliant with UNL web page accessibility policies. We are in the process of updating those and they will be re-released. Updates will be posted to social media and the turfgrass newsletter as completed publications are added to the turf.unl.edu website.

Industry stakeholder information

We are also in the process of gathering information about our stakeholders and how our program serves the needs of the industry. Please consider completing this brief survey: https://unlcorexmuw.qualtrics.com/jfe/form/SV_bwkMl3mQi1yBOdM

Please note that this document highlights many of our activities from the past year, but it does not encompass everything. If you have questions about specific projects mentioned here or others not included, or if you are interested in collaborating with our program to address specific turfgrass-related issues, please contact us.