

**USGA PROGRESS REPORT - 1987**

**Breeding, Evaluation and Culture of Buffalograss  
for Golf Course Turf**

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**A USGA/GCSAA/University of Nebraska Research Project  
Initiated July, 1984**

EXECUTIVE SUMMARY-NOVEMBER 1, 1987  
NEBRASKA PROJECT

The following items are considered most important in the long-term success of the buffalograss development project. This summary updates status on a new cultivar for 1989 and methods for propagating or marketing a new cultivar.

A. 1987 Synthetic for 1989 Turf-Type Buffalograss Cultivar

A synthetic planting was made June 25, 1987, using plant material selected for turf-type characteristics. This synthetic will be allowed to grow during 1987-88 and seed will be harvested from all female clones. This seed will be available for testing either in late 1988 or early 1989.

B. Buffalograss Evaluation and Demonstration Plots

Replicated tests have been initiated in Nelson, NE and Stillwater, OK. Additional tests will be conducted in cooperation with the NCR-10 Regional Turfgrass Committee at regional sites and also at Cornell, Rutgers, Michigan State, Texas A&M - Dallas, and Colorado State. Demonstration plantings (non-replicated) have been made in Yuma, AZ, Madras, OR, Marysville, OH, and Bettendorf, IA.

C. Evaluation of Caryopses Time and Storage Conditions

The caryopses in cold storage had a slightly lower germination than those stored at room temperature at 15 months. The high germination of the caryopses stored at room temperature will encourage further study into removal of the caryopses from the burr.

D. Plug Prerooting Requirements

The 1986-87 data shows that prerooting, as little as two weeks, will increase establishment rates for buffalograss allowing establishment during a single growing season.

E. Plug Fall Planting Study

Plugs were planted September 4 and 16, and October 6 and 28, 1986. Observations from this study showed more rapid cover and better overall establishment with plots planted in September.

F. Collections

Buffalograss was collected in seven south central counties of Nebraska on July 7-8, 1987, in the counties of Iowa bordering on the Missouri River and in Missouri. With the increase in funding for 1988, additional collections will be made throughout the area of buffalograss adaptation.

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## 1. Buffalograss Collection and Propagation.

### A. Collection

Buffalograss was collected in seven south central counties of Nebraska on July 7-8, 1987. Turf-type ecotypes of buffalograss were collected from lawns, cemeteries, parks, playgrounds, athletic fields, industrial sites, and native range areas. On July 14 and 15, a collection trip was made in the counties of Iowa bordering on the Missouri River. Only three buffalograss ecotypes were collected. The collection procedures used in the area west of the Missouri River did not appear to be effective east of the Missouri River. Only a few people we spoke to were familiar with buffalograss. The people that knew about buffalograss could not direct us to sites where it was growing. Buffalograss was collected in Missouri the last week in July. Two good samples were collected in Columbia, Missouri. One other sample was collected in a cemetery in northwestern Missouri.

Plans are being made to develop an information network for collected buffalograss in western Iowa. Requests have been sent through an extension newsletter in western Nebraska to send us turf-type samples of buffalograss. More effort must be put into an effective way of obtaining buffalograss from other cooperators.

Well over 80% of the ecotypes collected are better than the cultivar Texoka. The superior ecotypes of buffalograss are being evaluated and incorporated into an effective breeding program.

### B. 1987 Buffalograss Vegetative Selection Increase Area

The purpose of this planting is to increase plant material of 10 buffalograss clones which showed turf type characteristics selected from the 1986 evaluation area.

One hundred plugs of each of 10 selected plants were planted on five foot centers in 10,000 sq. ft. plots on May 12, 1987. Plugs were watered when necessary for the first four weeks. Data taken on the plots was, color, density, cover, survival, and an overall turfgrass quality. One of the selections was removed because of its very low survival rate and reassessment of turf quality. This plot will be replaced with another plant that we feel is superior to the one removed.

This area will be used to provide plant material for breeding, advanced testing and maintenance and cultural practice studies planned for the future. We will also be able to send some of this material to other universities for evaluation.

### C. Buffalograss Demonstration Plots

Nelson, NE

The soil is a Geary silt loam and had been in either high maintenance bluegrass sod or a mixture of bluegrass, crabgrass, orchardgrass in a low maintenance situation. The high maintenance area was prepared by treating with Roundup, removing all

sod, and rototilling. The low maintenance area was treated with Roundup, deep chiselled, and rototilled to a garden-like condition. Both areas were packed by watering.

The plugs were planted May 19 with a 2 inch plugger. The vegetative plugs were furnished by UNL-IANR from the USGA buffalograss development project.

Vegetative plugs were placed approximately 2 feet apart, 25 plugs/100 square feet. Thirty two plots were established using 11 selections. Most of the selections were replicated three times. Simazine(Princep) was applied at the rate of 1 lb. a.i./acre. Water was applied two times a week for four weeks, then only when extremely dry.

The evaluation showed many shades of green, all of which were satisfactory and superior to common buffalograss (Texoka). The vertical growth of most selections was similar to Texoka. Horizontal growth of most varieties was excellent. Selection NE 84-506 would not be satisfactory. Fineness of vegetation of all selections was superior to Texoka except for selection NE 84-104, which is a coarse, tough, fast-growing selection. All selections would be much superior to common buffalograss for a residential turf(Photos 1 and 2).

#### Yuma, AZ

Eleven selections of buffalograss were planted at the Yuma, Arizona Experiment Station on May 13, 1987, in cooperation with Farmers Marketing Corporation. Initially, temperatures were very high (+105°F); however, most of the buffalograss selections survived and have performed quite well. Selections have shown characteristics fairly similar to what has been observed in Nebraska, except that growth seems to be greater under higher temperatures.

These Materials are being evaluated in Yuma by Farmers Marketing for potential seed production of buffalograss. Presently, due to high temperatures seed development has not occurred. It is possible that there will be some seed development or production during this fall, but plants will be evaluated next spring for this characteristic.

Farmers Marketing Corporation is very interested in the possible use of buffalograss, both for turf and seed production. They have been impressed with its performance and would be interested in discussing their plans with the United States Golf Association. They have also discussed the possibility of the Warehausen Corporation becoming involved in placing their support behind the project.

#### Oklahoma State University

Dr. Joel Barber, who received his Ph.D. from Nebraska in June, accepted a position at Oklahoma State University on July 1, 1987. At that time, he took along a number of the better buffalograss selections for evaluation at Stillwater, Oklahoma. Presently the test is in the establishment stage, but plants have survived and are growing. During 1988, one of us will travel to

Stillwater to evaluate performance at this central southern Great Plains location.

#### Madras, Oregon

This planting was made in cooperation with Lofts Seed (Rich Hurley) and Full Circle, Inc. (Jim Steinke). The objective of this project was to evaluate potential seed production of some of our better clonal material in the eastern Oregon dryland area. Initial information indicates that the buffalograss is growing well. Seed production will be evaluated during the spring of 1988.

#### NCR-10 Evaluation

During 1988, the NCR-10 Regional Turfgrass Group will be conducting an alternative grass evaluation test. One of the grasses that is going to be evaluated is Texoka buffalograss. We have made arrangements to also supply vegetatively one of our better turf-type selections for evaluation. This material will be planted in 8 to 10 locations throughout the north central region.

#### Seed Treatment - Dehulling in Minnesota

Farmers Marketing Corporation has made arrangements with a company in Three River Falls, Minnesota, to dehull large samples of Texoka buffalograss. They have had mixed results obtaining yields between 15 and 25% for the various lots of seed that they have used. When dehulled, the buffalograss seed that they obtained has shown quite good percent germination and it germinates much more rapidly than unhulled burrs. Currently, Farmers Marketing Corporation is working with this company to develop a machine that would have greater capacity and produce a greater percent yield. This area would be very important if it is felt necessary to market the hulled caryopses for professional turf use.

#### Other Demonstration Areas

During 1988, buffalograss plant material will be sent to other areas of the country for evaluation. Areas potentially selected have been Cornell University, Ithaca, New York; Rutgers University, New Brunswick, New Jersey; Michigan State University, East Lansing, Michigan; Texas A&M - Dallas, Dallas, Texas; and Iowa State University, Ames, Iowa. These tests will probable include up to 10 of the better selections and material will be evaluated to turf performance and other characteristics.

O.M. Scott & Sons, Marysville, Ohio. One selection of Texoka buffalograss and one turf-type buffalograss selection were sent to Virgil Meyer at O.M. Scott & Sons, Marysville, Ohio. This was for demonstration purposes and to indicate some of the progress made with buffalograss to date. The turf-type selection

sent is not one that was listed as one of our better selections; however, performance was quite good. This project, as with others, was all done under a screening agreement and a signed agreement is available.

Plug Planting, Bettendorf, Iowa. Five thousand Texoka buffalograss plugs were sold to the Corps of Engineers for use on a levy on the Mississippi River. Their objective in this planting was to stabilize an area that would require low maintenance because it had Grid-Lock concrete material. They feel that buffalograss has a lot of potential for uses like this, and if this is successful, they will be interested in using additional material.

Buffalograss Salt Evaluation, El Paso, Texas (Garald Horst). Several improved selections of buffalograss have been sent to Dr. Horst for increase and evaluation of salt tolerance. This work is being done within the confines of both USGA projects. Garald has been very aggressive in soliciting this material for the benefit of the project.

Dr. Robin Cuany, Colorado State University. On October 14, Dr. Robin Cuany, CSU, visited Nebraska and traveled to Mead to look at our buffalograss work. Dr. Cuany gave several suggestions which will aid us in this project and we also discussed his project on his native grasses. We discussed potential cooperation and evaluation of his species and the buffalograss species. This work would probably be undertaken during 1988 and 1989.

## 2. Buffalograss Plant Breeding

### A. 1987 Buffalograss Synthetic

This planting was made June 25, 1987, using plant material selected for turf-type characteristics. Selections were made based on color density, low-growth habit, and amount of seed production. Plants were selected regardless of sex, but planting was made to aid in pollination of females by male plants. During the late fall of 1987, seed will be harvested and bulked from all plant material.

During the spring of 1988, all plant material will be burned, mowed and fertilized. Selections showing problems with quality or winter kill will be removed from the synthetic. This synthetic will be allowed to grow during 1987 and seed will be harvested from all female clones. This seed will be available for testing either in late 1988 or early 1989. During 1988, additional synthetics using a smaller number of plants will be developed using this synthetic planting scheme. This planting was made to test the feasibility of moving large buffalograss plugs. Plants did not wilt or stop growing during the hottest part of the summer. This planting scheme will allow for synthetics to be planted one year and seed harvest to take place during the following year (Figure 1).

## B. Buffalograss breeding and seed production

The purpose of this planting is to estimate yields of the outstanding buffalograss clones selected during 1985 and to generate seed for plot evaluation.

This planting was made on June 12, 1986, in 8 x 8 ft. plots. Most clones had covered the area by fall of 1986. Plots were harvested and mowed last fall. Yields are being estimated by weighing the seed collected from a 4 x 3 ft. area. During the fall and winter of 1986 and 1987 the seed collected was cleaned, but, due to the time required it was not ready for planting in 1987. Plots will be harvested again this fall, and the seed will be cleaned using a different method and the seed from both 1986 and 1987 harvests will be ready for planting in 1988.

## C. Sex ratios

A study will be started in the spring of 1988 to determine the sex ratios of the caryopses from the burrs harvested off of several of the improved buffalograss plants. The caryopses will be planted in progeny evaluation plots and the sex of each plant from each mother plant will be recorded and the sex ratio determined. This will tell us whether or not the improved grasses have a different ratio of males to females compared to the Texoka, which has an approximate 1:1 sex ratio. Presently, a literature search is being done to update the information in this area.

## 3. Buffalograss Seed Treatment Evaluation

### A. Buffalograss Protection of Caryopses from Herbicide

Seed softeners are being used to increase herbicide tolerance for buffalograss establishment. In the future, we will be looking at the potential for using the alleopathic properties of the burr as a possible herbicide.

### B. Evaluation of Time and Storage Conditions on Buffalograss Caryopses Germination

**Introduction:** Traditionally buffalograss is stored in the burr, often under cool, dry conditions. With present work at UNL on the removal of the caryopses from the burr, storage of the caryopses and their viability over time has been a concern. Commercially obtained KNO<sub>3</sub> treated and untreated burrs and caryopses removed from these burrs were stored at room temperature and in cold storage for 3, 9, and 15 month intervals to determine the effects of storage time and conditions.

**Objectives:** The objectives of this study are 1) to determine the effect of storage time on buffalograss germination of treated and untreated burrs and caryopses, and 2) to determine the effect of



storage conditions.

**Materials & Methods:** Fifteen hundred  $\text{KNO}_3$  treated burrs and non- $\text{KNO}_3$  treated burrs were counted out by hand and placed in cold storage and under room temperature conditions. At the same time, 3000  $\text{KNO}_3$  treated burrs and 3000 non- $\text{KNO}_3$  treated burrs were processed in a barley pearler to separate the caryopses from the burr. The remaining material was put through a blower and a series of screens to separate the chaff from the caryopses. From each treatment, 1500 of the exposed caryopses were placed in cold storage and 1500 were placed at room temperature. The burrs and caryopses were put in marked paper sacks to prevent accumulation of moisture and premature germination. Treatments were assigned as follows:

- TRT 1 = Treated burrs at room temperature
- TRT 2 = Untreated burrs at room temperature
- TRT 3 = Treated seed at room temperature
- TRT 4 = Untreated seed at room temperature
- TRT 5 = Treated burrs in cold storage
- TRT 6 = Untreated burrs in cold storage
- TRT 7 = Treated seed in cold storage
- TRT 8 = Untreated seed in cold storage

Each treatment consists of four replications with 125 caryopses or burrs per petri dish. Analyses were made at 3, 9 and 15 months. Three months was chosen to determine a base testing germination, nine months was chosen because of federal seed testing requirements and fifteen months was chosen to test shelf life from harvest of one season to the planting season of the following year. The petri dishes were put in a growth chamber where light requirements of 16 hours and temperature requirements of a minimum  $70^\circ\text{F}$  and a maximum  $95^\circ\text{F}$  were met. Seedling counts were taken at 4 days, 7 days, and 14 days.

**Discussion:** The caryopses in cold storage had a slightly lower germination than those stored at room temperature. The difference was negligible in the first 9 months, but at 15 months it became more apparent, possibly showing a trend towards decreased germination when kept under cold storage for 15 months. Burrs in cold storage had better germination than those stored at room temperature. The burrs showed a very large drop in germination at 9 months indicating the possibility that long term storage of burrs is unfavorable. High germination of the caryopses stored at room temperature will encourage further study into removal of the caryopses from the burr. A second test will be evaluated during 1987 and 1988 and the data from both years will be compiled and analyzed to determine the best storage conditions (Figures 2, 3 and 4).

#### 4. Buffalograss Vegetative Establishment

##### A. Prerooting requirements

The examination of prerooting requirements for buffalograss plugs was repeated during 1987 to replicate results from 1986. Fifty by fifty mm plugs of Texoka buffalograss were prerooted for 2, 4, and 8 weeks in the greenhouse in cavity trays. These plugs were compared to non-prerooted plugs. A comparison of fertilization vs. non-fertilization at the time of harvest was also included. After plantings in the field, plots were fertilized and treated with herbicide. Stolon counts were taken for the first four weeks and turfgrass color and percent cover were measured over the growing season.

The statistical analysis from the 1986 growing season showed that early in the growing season there were significant differences between prerooted and non-prerooted plugs of buffalograss. As the season progressed, differences between treatments were less evident. Analysis shows differences attributed to prerooting rather than differences in fertilization. The 1986 data shows that prerooting, as little as two weeks, will increase establishment rates for buffalograss allowing establishment during a single growing season.

Data from 1987 have not been analyzed, however examination of the data shows similar trends to the previous year's work. Following analysis of the data, recommendations for prerooting requirements for turfgrass establishment of buffalograss will be available (Figure 5 and 6).

##### B. Carbohydrate analysis

Work is proceeding on the analysis of non-structural carbohydrate storage in prerooted and non-prerooted buffalograss plugs. Using the same treatments and procedures as used in determining prerooting requirements, plugs were sampled for analysis. Plugs were sampled at the time of planting and every two weeks for the subsequent eight weeks. These samples will be divided and analyzed by root, stolon, and crown and top growth. Samples will be analyzed using a digestion method developed by Dale Smith (University of Wisconsin, 1981). This work will be carried out this winter.

##### C. Fall planting study

The examination of late season planting of buffalograss plugs was conducted during the past 1986-87 season. Plugs were planted out September 4 and 16, and October 6 and 28, 1986. During the 1987 growing season, turfgrass color and percent cover ratings were taken. Observations from this study showed more rapid cover and better overall establishment with plots planted in September. The October plantings plots were slow to cover, but did show acceptable cover by the end of the 1987 growing season. Statistical analysis will be run on this work. This study is being repeated with September 4 and 18, and October 5

and 14, 1987, planting dates. Results from this work would allow for expansion of planting and greater opportunity for establishment of buffalograss.

#### D. Plug Spacing

This study looks at the spacing requirements for establishment of prerooted and non-prerooted plugs. The objectives of this study are 1) to determine spacing requirements for buffalograss plugs when establishing a turf area vegetatively, and 2) to determine if prerooting has an effect on this spacing.

Non-prerooted plugs were compared to 8 week prerooted plugs in this study. The plugs were planted on 6, 12, and 18 inch centers. This gave six treatments for comparison. The study was planted in the field on May 21, 1986. Plugs were fertilized with starter fertilizer at harvest and when planted. Plots were treated with 1 lb. a.i. Simazine/acre. Stolon counts were taken for the first 3 weeks and turfgrass color and percent cover ratings were measured over the growing season.

Prerooted plugs showed consistently higher ratings than non-prerooted plugs throughout the growing season at each of the 3 spacings. While the 6 inch spaced plugs had initially higher ratings, as the season progressed the 12 and 18 inch spaced plugs showed coverage equalling the more closely spaced plugs.

This study was repeated in 1987 with plantings made on June 3, 1987. Data collected this year has not been completely analyzed but results are similar to the 1986 results. Data from these two growing seasons show little need for closely spaced plugs, unless very rapid cover is required (Figure 7 and 8).

#### E. Plug Fertilization

This study determines the effect of fertilization at the time of planting, and the effects on establishment. The objectives of this study were 1) to determine the effects of fertilizer on the establishment of buffalograss plugs, and 2) to determine if prerooting affects a fertilized buffalograss plug during establishment.

Non-prerooted and 8 week prerooted plugs were used in this study. The comparisons of fertilizing with 1 lb. of N/1000 sq. ft. versus non-fertilization were used. This provided for 4 treatments in this study. The study was planted in the field on May 20, 1986.

The following observations were made: 1) plugs that were fertilized at planting appeared to have better initial growth, 2) prerooted plugs appeared to establish more rapidly and produce higher stolon counts, and 3) after 14 weeks of growth, differences in coverage between treatments were not evident.

This study was repeated on June 3, 1987. Data collected this year has not been analyzed but the results are similar to the 1986 results. When the 1987 data is analyzed the two year results will be compiled and fertilization recommendations will be made (Figure 9).

#### F. Herbicide treatment

The objectives of this study were: 1) to determine the effects of herbicide on the establishment of buffalograss plugs and 2) to determine if prerooting affects the establishment of buffalograss plugs treated with herbicide.

Non-prerooted and 8 week prerooted plugs were used in the study. Plots were treated with Simazine at a rate of 1 lb. a.i./acre after planting and the control plots were untreated. This gave 4 treatments to be observed. The study was planted to the field on May 21, 1986.

The following observations were made: 1) prerooted plugs appeared to establish more rapidly than non-prerooted plugs, 2) plots treated with Simazine appeared to produce a more dense, higher quality stand, and 3) plots not treated with Simazine had a difficult time competing with the weeds and did not appear to produce a quality stand.

This study was repeated on June 3, 1987. Data collected this year appears to show similar results (Figure 10).

#### G. Perennial ryegrass/buffalograss interplugging study

This study was initiated to determine if prerooted and non-prerooted buffalograss plugs would establish stolons in a killed perennial ryegrass thatch and to determine if a suitable turf would establish in thatch.

An established perennial ryegrass turf was sprayed with Roundup to kill the turf. Four weeks prior to planting, pendimethalin was sprayed on the dead turf as a pre-emergence weed control. This study was planted on June 4, 1987, with both non-prerooted and prerooted plugs on either one-foot or two-foot centers. One pound of starter fertilizer was applied following planting and the test was watered daily for the first few weeks of establishment. Stolon counts were taken weekly for 5 weeks and color and percent cover were taken for the entire growing season.

Prerooted plugs at 12 inch centers initially had more stolon growth and covered more quickly than the other three treatments. This study will be repeated in 1988 and the compiled data from the two years will be used to make recommendations for interplugging buffalograss into dead turf (Figure 11).

### 5. Cultural Practices

#### A. 1986 Advanced Evaluation

The purpose of this area is to evaluate outstanding male and female clones selected during 1985. During the later half of 1987 the plots were maintained at two mowing heights. During 1988 the plots will be maintained at two mowing heights and two fertility levels.

Data was taken monthly on color, cover and density. Early greenup data was taken in the early spring and dormancy colors

were recorded into late fall. This data has helped us to select superior plants and have been added to our breeding program and other increase areas for further evaluation.

#### B. 1987 Advanced Evaluation Area

The purpose of this planting is to evaluate 50 outstanding male and female clones selected during 1986 and spring of 1987 for turf type characteristics. Plots were planted May 21, 1987 and were watered as necessary for the first four weeks. Later in the growing season the more aggressive clones were kept separated by using Roundup. Slower spreading clones will be planted with additional material in 1988 to increase coverage. In 1988 the clones will be maintained at two mowing heights and two fertility levels. Data will be taken on early greenup and late fall color and monthly ratings will be taken on color, density and percent cover.

#### C. Water use rates

In 1988 a study will be initiated looking at the water use rates and photosynthetic rates of some of the improved buffalo-grass plants. This study will help us see if the plants selected for good color and density are maintaining the lower water requirements desired. At present, a literature search is being done to update information and techniques that will be needed to initiate this study.

#### D. Development of Digital Image Analysis as a Technique for Quantifying Turfgrass Rooting Parameters

Study of the root/soil biosystem has traditionally been labor intensive and most times destructive in nature. With the advancements in technology, non-destructive in situ studies are conducted through use of rhizotrons and mini rhizotrons. Acquisition of the rooting data, using the rhizotrons, is however, the technique of remote sensing and digital image analysis for studying in situ rooting parameters hence facilitating the acquisition and analysis of the rooting data. The direct objective of this study is to compare the manual methods of line intersect and inch counting to that of the digital method.

This study utilizes buffalograss established in mini rhizotron cells. The mini rhizotron cells, housed in the research greenhouses, were built from treated wood and are 30cm x 30cm x 122cm (1ft x 1ft x 4ft) in size. The viewing surface is acrylic plastic. Buffalograss was vegetatively propagated August 11, 1987 to cells containing 85% river washed sand and 15% sharpsburg soil. As of October 11, 1987 observation of rooting depth at 122 cm (4 ft) was noted, with roots being extensively visible at the soil/plexiglass interface.

The technique of digital image analysis will be compared with the line intersect method developed by H. M. Taylor (Auburn University), and the inch counting method utilized by D. C.

Reicosky (University of Illinois). The two methods listed require either manually counting or tracing the roots seen at the plexiglass surface to obtain the rooting parameters of root length and root intensity (length/unit viewing surface area). With the digital technique, photographs of the roots will be digitized using a vidicon camera and analog to digital converter. Using the image processing package ERDAS, (Earth Resources Data Analysis System) the digital images of the roots will be analyzed to quantify the rooting parameters of root length and root intensity.

## 6. Presentations

- 1986 - Enhancement of Germination of Buffalograss (*Buchloe dactyloides* (Nutt.) Engelm.) For Urban Use.  
Authors: Jeana L. Frogge, T. P. Riordan, E. J. Kinbacher, and R. C. Shearman.  
Poster Presentation at American Society of Horticultural Sciences North Central Region Meeting July 1986.
- 1987 - Buffalograss Establishment For Turf Use.  
Authors: D. J. Schwarze, J. L. Frogge, T. P. Riordan, E. J. Kinbacher, R. C. Shearman.  
Oral Presentation for the Nebraska Academy of Sciences, Graduate Women in Science, April 1987.
- Evaluation of Time and Storage Conditions on Buffalograss (*Buchloe dactyloides* (Nutt.) Engelm.) Caryopses Germination.  
Authors: Jeana L. Svoboda, T. P. Riordan, E. J. Kinbacher, R. C. Shearman.
- Optimum Plug Spacing Requirements For Establishment of Buffalograss.  
Authors: D. J. Schwarze, T. P. Riordan, J. L. Svoboda, E. J. Kinbacher, R. C. Shearman.  
Poster Presentations at American Society of Horticultural Sciences North Central Region Meeting. July 1987.  
Both posters were presented for competition in 1987, posters received 1st and 2nd place respectively.
- Effect of Prerooting on the Establishment of Buffalograss Plugs.  
Authors: D. J. Schwarze, T. P. Riordan, J. L. Svoboda, E. J. Kinbacher, R. C. Shearman.  
Will be presented at the American Society of Horticultural Sciences national meeting in November 1987.
- Buffalograss Establishment From Burred and Deburred Caryopses.  
Authors: E. J. Kinbacher, J. L. Svoboda, T. P. Riordan, R. C. Shearman.

To be presented at the American Agronomy Society National meeting November 1987.

- T. P. Riordan and J. L. Svoboda made an appearance on Backyard Farmer, a local T.V. program to discuss the buffalograss research being done at UNL and its possible use on golf courses and home lawns. Aired July 1987.
- A buffalograss openhouse was held at Nelson, NE where several of the improved buffalograsses have been planted. Chet Hawley, Nuckolls County Extension Agent, was the host and speakers were J. L. Svoboda, D. J. Schwarze, T. P. Riordan and E. J. Kinbacher. Approximately 50 area people, including extension agents, home owners, industry business people and farmers attended.

#### Future Presentations

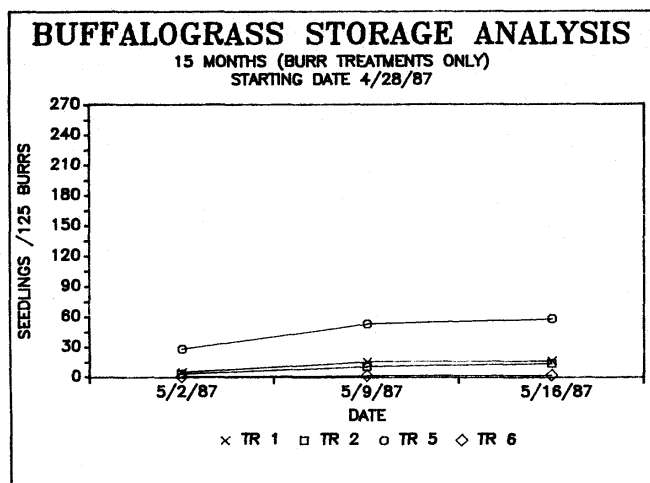
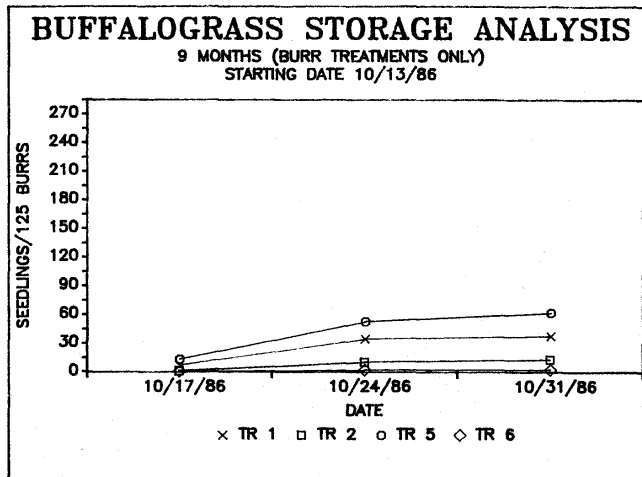
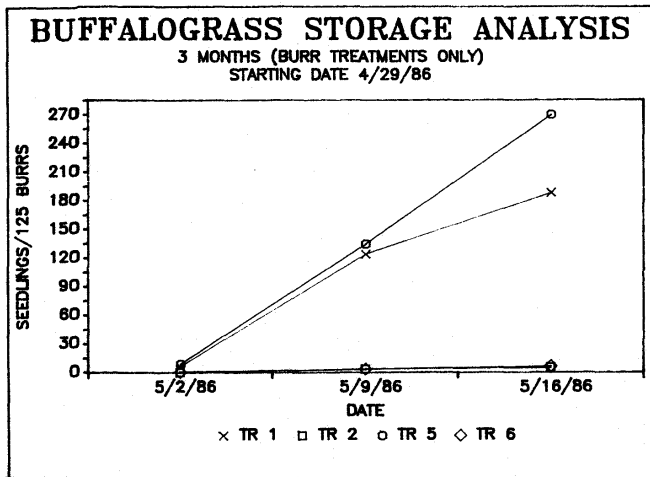
- A NebGuide for public use on the establishment of buffalograss for lawn use is being written up and prepared for publication at this time and should be available early spring 1988.
- All posters prepared on buffalograss will be presented at the Nebraska Turfgrass Foundation Conference in January 1988. They will be on view for all attendees to look at and speakers will be on hand to discuss the project in depth.

Figure 1.

## 1987 BREEDING SYNTHETIC PLANTED 6/25/87

PLANT #	ORIGIN	SEX
HOLMES	HOLMES GOLF COURSE	9M, 1M&F
BIRD	BIRD	M
BIRD	BIRD	F
84-5-2	FT. COLLINS, CO	F
84-6-3	" " "	M
84-9-1	" " "	?
84-12	" " "	F
84-13-2	" " "	F
84-15-1	" " "	M
84-18-3	" " "	M
84-19-1	" " "	M
84-25-2	" " "	F
84-29-3	" " "	M
84-36-2	EATON, CO	M
84-45-3	COLORADO	F
84-48-2	JULESBURG, CO	F
84-108	TEXAS	F
84-205	SWISHER, TX	F
84-315	FILMORE, NE	F
84-404	TEXAS	F
84-412	TEXAS	M & F
84-506	TEXAS	F
84-608	TEXAS	M
84-800	ARIZONA	F
84-802	ARIZONA	F
84-903	GRAND ISLAND, NE	F
84-924	BEATRICE, NE	F
84-926	" "	F
84-927	" "	F
84-932	" "	F
85-6	VOGELS MEAD PLOTS	M
85-23	" " "	M
85-23	" " "	F
85-97	BEATRICE, NE	F
85-100	" "	F
85-111	CUSTER CO. NE	M
85-129	BROKEN BOW, NE	F
85-147-2	HASTINGS, NE	M
85-152-7	" "	F
85-154-1	" "	F
85-158-2	" "	F
85-173	SUPERIOR, NE	M
85-190-2	" " "	F
85-199-1	RED CLOUD, NE	M
85-201	FT. COLLINS, CO	F
85-212	" " "	F
85-217	CHEYENNE, WY	M & F
85-220	" " "	M





An average of 2.28 caryopses per burr allows for germination averages exceeding 125 seedlings. Values for each date are an average of the four replications.

Figure 2.

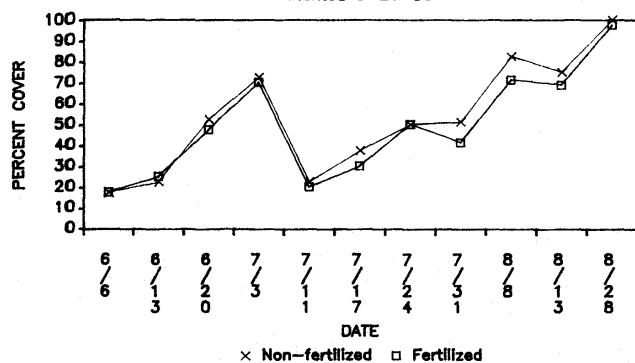
# GERMINATION RESULTS

	CARYOPSES		BURRS	
	COLD	ROOM	COLD	ROOM
3 mo	96%	97%	110%*	77%
9 mo	93%	94%	26%	20%
15 mo	87%	92%	24%	13%

\* More than one caryopses/burr

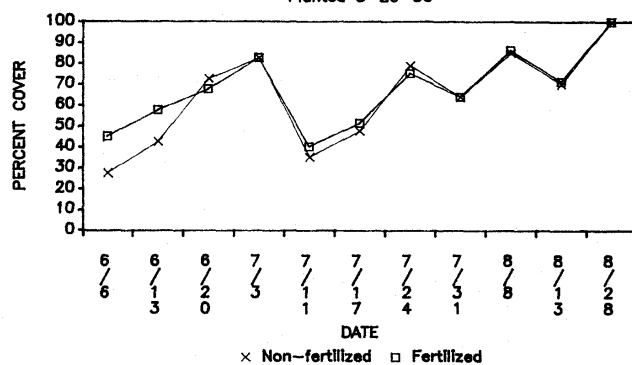
### PREROOTED PLUG STUDY

Non-prerooted buffalograss plugs  
Planted 5-20-86



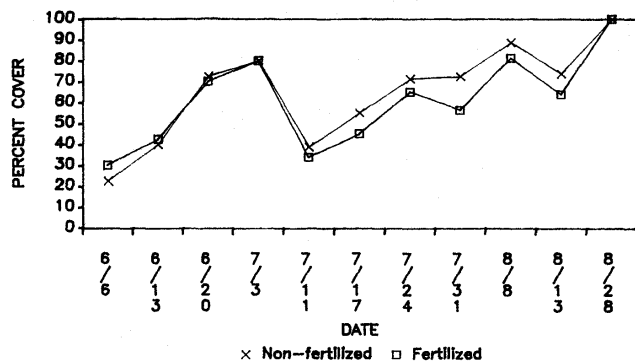
### PREROOTED PLUG STUDY

2 week prerooted buffalograss plugs  
Planted 5-20-86



### PREROOTED PLUG STUDY

4 week prerooted buffalograss plugs  
Planted 5-20-86



### PREROOTED PLUG STUDY

8 week prerooted buffalograss plugs  
Planted 5-20-86

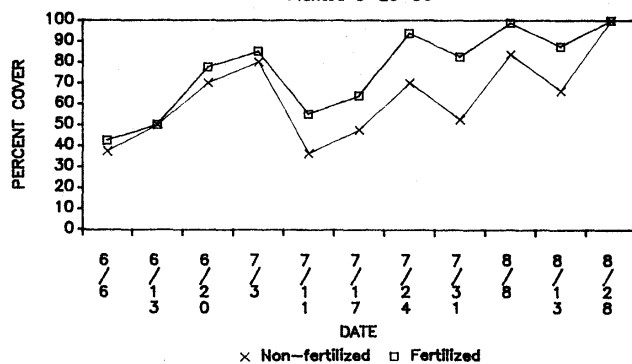
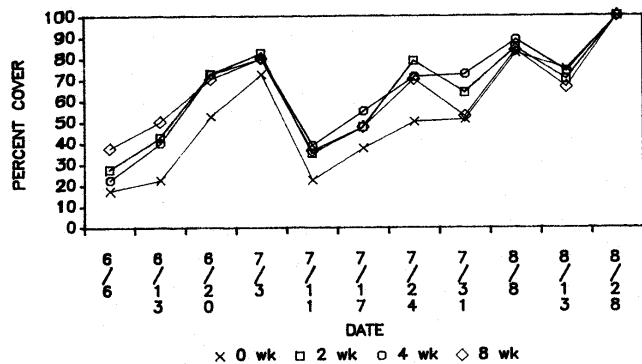


Figure 5.

# PREROOTED PLUG STUDY

Non-fertilized buffalograss plugs  
Planted 5-20-86



# PREROOTED PLUG STUDY

Fertilized buffalograss plugs  
Planted 5-20-86

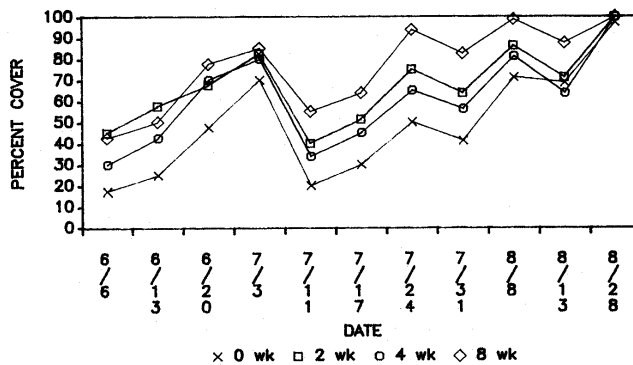
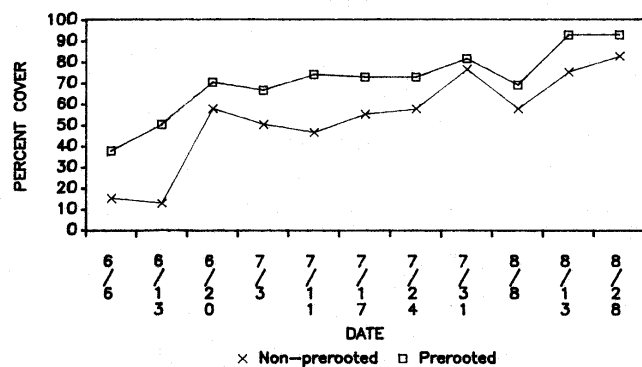


Figure 6.

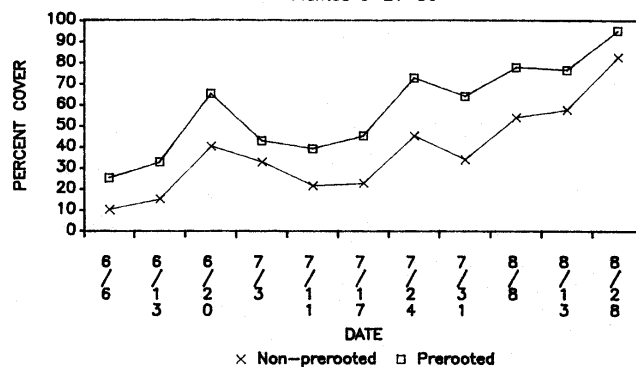
### BUFFALOGRASS SPACING STUDY

Plugs planted on 15 cm centers  
Planted 5-21-86



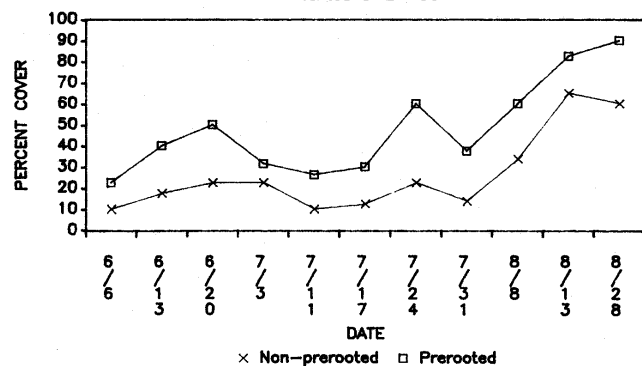
### BUFFALOGRASS SPACING STUDY

Plugs planted on 30 cm centers  
Planted 5-21-86



### BUFFALOGRASS SPACING STUDY

Plugs planted on 45 cm centers  
Planted 5-21-86

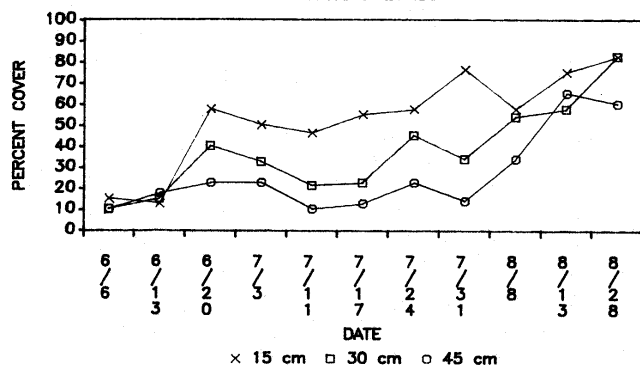


Data values shown  
are means of 4  
replications.

Figure 7.

# BUFFALOGRASS SPACING STUDY

Non-prerooted plugs  
Planted 5-21-86



# BUFFALOGRASS SPACING STUDY

Prerooted plugs  
Planted 5-21-86

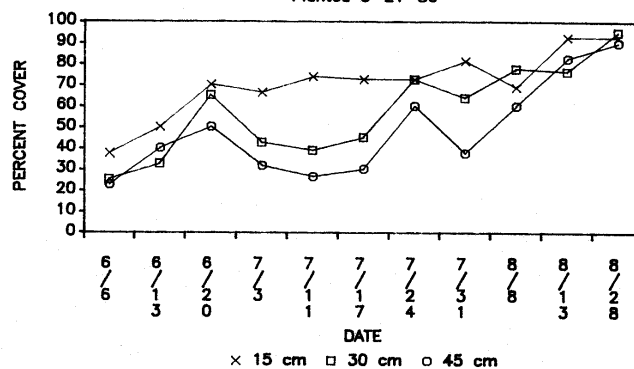
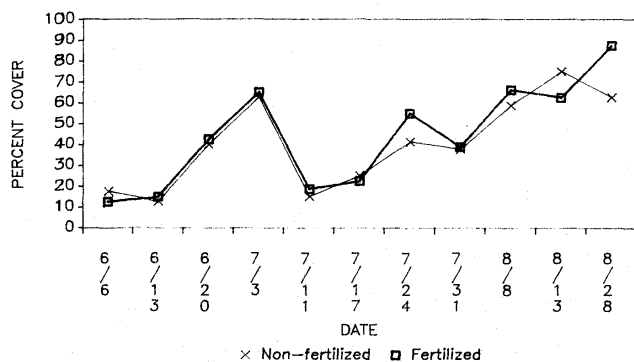


Figure 8.

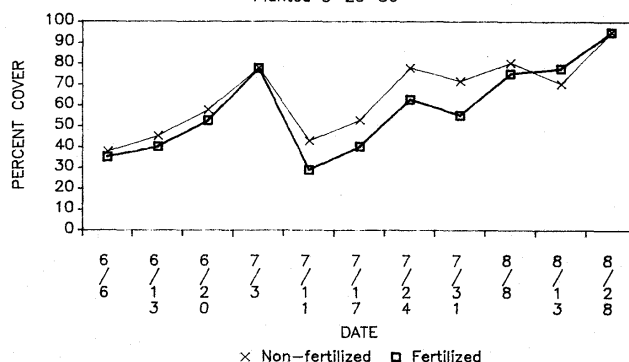
### BUFFALOGRASS FERTILIZER STUDY

Non-prerooted plugs  
Planted 5-20-86



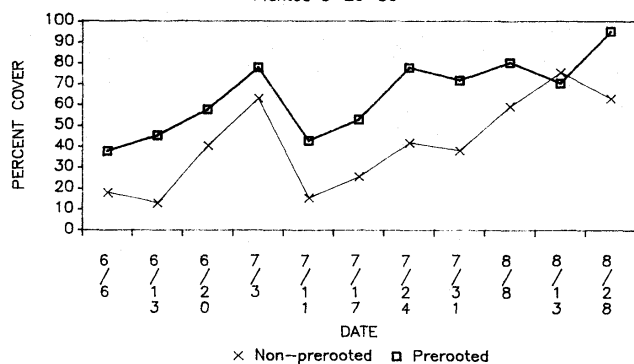
### BUFFALOGRASS FERTILIZER STUDY

Prerooted plugs  
Planted 5-20-86



### BUFFALOGRASS FERTILIZER STUDY

Non-fertilized PR and NPR plugs  
Planted 5-20-86



### BUFFALOGRASS FERTILIZER STUDY

Fertilized PR and NPR plugs  
Planted 5-20-86

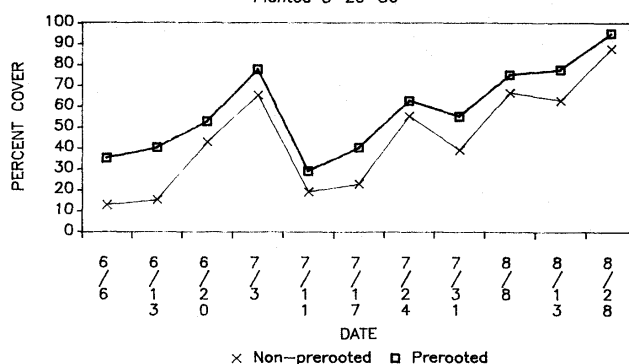
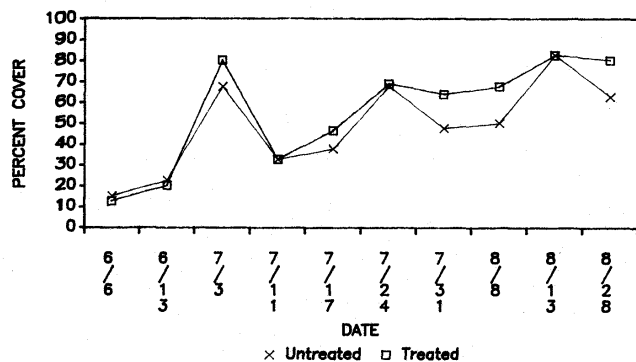


Figure 9.

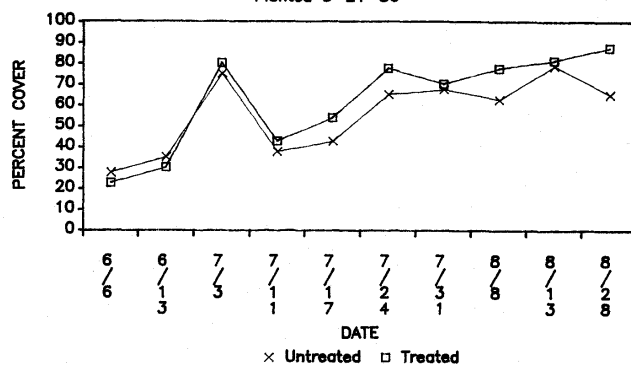
### BUFFALOGRASS HERBICIDE STUDY

Non-prerooted plugs  
Planted 5-21-86



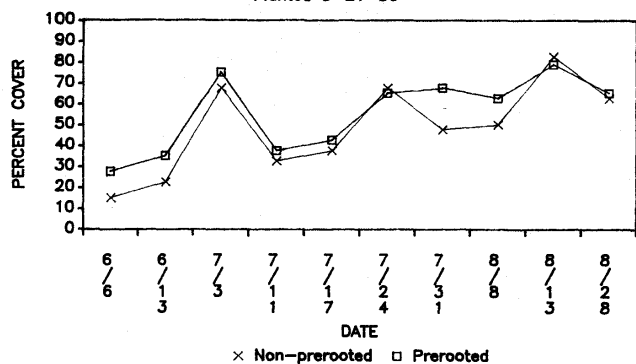
### BUFFALOGRASS HERBICIDE STUDY

Prerooted plugs  
Planted 5-21-86



### BUFFALOGRASS HERBICIDE STUDY

Untreated PR and NPR plugs  
Planted 5-21-86



### BUFFALOGRASS HERBICIDE STUDY

Treated PR and NPR plugs  
Planted 5-21-86

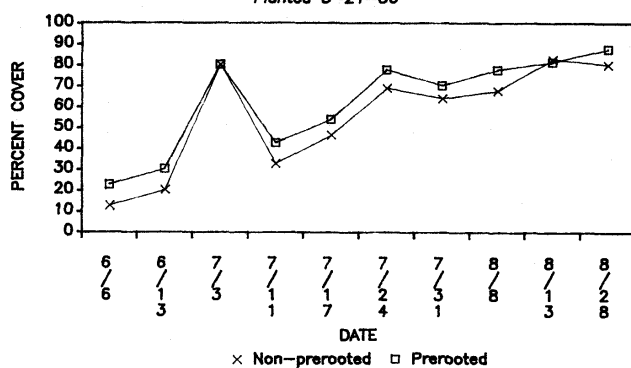
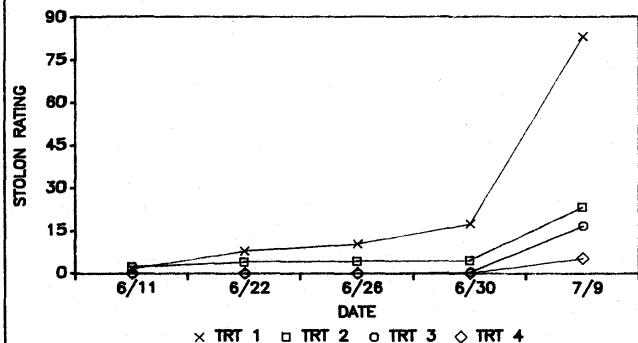


Figure 10.



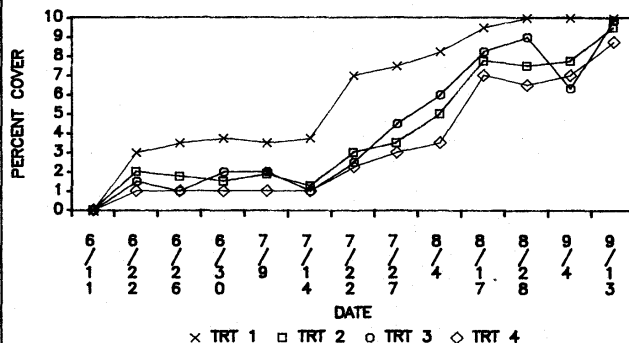
# PERENNIAL RYE/BUFFALOGRASS INTERPLUGGING STUDY

Planted 6-11-87



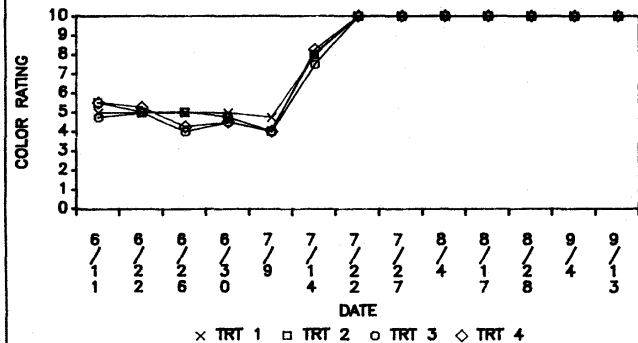
# PERENNIAL RYE/BUFFALOGRASS INTERPLUGGING STUDY

Planted 6-11-87



# PERENNIAL RYE/BUFFALOGRASS INTERPLUGGING STUDY

Planted 6-11-87



Values for each date  
are an average of the  
four replications.

Figure 11.



Open house presentation at  
Nelson, Nebraska. September 1987



Improved selections located  
at Nelson, Nebraska. September 1987



1985 collection plots.  
May 1987



Vegetative propagation & carbohydrate studies. September 1987