

Fall 2019



## Transitions to Fine Fescues

**Research Purpose:** To develop low-input, fine fescues that support multiple public and private uses in diverse landscapes.

**Background & Objectives:** What are the perceptions of public land managers on a variety of topics related to fine fescue turfgrasses including the selection of turfgrasses, the role that they should play within the landscape, and perceived barriers and opportunities for transitioning to low-input turfgrasses such as fine fescues.

To gain insights on this, we conducted six focus groups with 31 total participants at field day events in New Jersey, Indiana, & Oregon. Managers represented a variety of institutions and organizations from municipal land managers to golf course superintendents. Some of these managers worked in organizations where they were the sole individual in charge of land management and others were part of large teams with specialized jobs. They represented diverse public lands across the urban to rural gradient.

**Findings & Insights:** The results of the focus groups are summarized on the following pages in several key takeaways that were consistent across the locations. Each takeaway is a general area of concern, followed by what the research group *has done* or *will do* to address it.



**Authors:** Michael R. Barnes, Kristen C. Nelson, with support from Eric Watkins, Alec Kowalewski, Aaron Patton, Paul Koch, & James Murphy.



## Opportunities for Transition

- Managers expressed the need to lower input costs for turfgrass establishment and maintenance. When appropriately managed, fine fescues would help with this goal.
- Fine fescues are advantageous due to lower maintenance requirements that not only save money but labor; this is particularly important as skilled labor is in short supply across the country.
- Managers described that fine fescues would also become increasingly attractive as a turfgrass option as watering restrictions already in place in many areas become more common across the country.
- Fine fescues can potentially fill a niche across both public and private lands where a) turfgrass is desired or required but not actively used b) where other turfgrass varieties struggle to establish, or c) regular maintenance is not available or cost-effective.



# Barriers for Transition

1. *Managers explained that lack of success in the establishment of earlier varieties led to the perception that fine fescues have a lot of challenges. They consistently expressed difficulty establishing fine fescues with the standard establishment procedures.*
  - a. *Ready now:* Seed mixtures can be used that help during the establishment of stands of fine fescues; most commonly, fine fescues are mixed with perennial ryegrass to help the slower establishing fine fescues compete later on. Other nurse grasses can be used in aiding the establishment of fine fescue.
  - b. *Information ready within the year:* A variety of establishment procedures exist, some examples can be found at the links below; however, more comprehensive and step-by-step procedures should be compiled into a single document for individuals to follow. The team will be working on producing such a guide that will be freely available in the future.
    - i. [Fine Fescue Establishment & Management Protocol – Sam Bauer – University of Minnesota](#)
  - c. *Longer-term:* First, research on improved varieties is needed to identify establishment practices and specific genes in fine fescues that help the grasses germinate and establish more quickly. Second, new varieties need to be advantageous for seed production and commercially available.
2. *What are fine fescues? Some managers expressed extreme confusion with the plethora of fine fescue names, and many don't go any further due to not being able to pick out specific varieties that have available information.*
  - a. *Ready now:* There are guides available on a broad level to help identify and understand the differences between the species of fine fescue.
    - i. [Purdue Turf Tips Varieties of Fescues - Fescue. You mean there's more than one kind?](#)



## Barriers for Transition

- b. *Information ready within 1-2 years:* Species of fine fescues do indeed have different attributes which may or may not be suitable for a particular location or use case. The team will be working on an easy to use resource information source for choosing a fine fescue variety that would be suitable for a specific location, including an app that can show commercially available varieties.
  - c. *Long-term goal:* Confusion in the naming and identification of fine fescues starts with the fact that there are a large number of species, subspecies, and varieties of fine fescues that aren't well sorted out on the biological level. Future work will need to address this to make clearer distinctions at the different levels of identification.
3. *Some public land managers had poor experiences with past varieties of fine fescues and are less willing to use current fine fescues without evidence based on their own hands-on experience with new varieties as well as evidence from research station experiments*
- a. *Ready now:* Demonstration plots on 6 campuses showcase the utility of fine fescues as low-input turf options.
    - i. For a list of locations see: [Demo Plot Location List](#) – [Demo Plot Google Map](#)
  - b. *Information ready within 1 year:* Perhaps one of the reasons behind these perceptions is due to the use of substantially older varieties. There are dozens of new fine fescue varieties with considerably better performance that have been introduced in recent years. The team will be working on extension documents, working with distributors, and marketing efforts to update individuals on the current varieties of fine fescue available for use. Below is a short list of newer varieties and is not comprehensive.
    - i. Rutgers Extension – James Murphy - [Fine Fescues: Low Maintenance Species for Turf](#)



# Barriers for Transition

- c. *Mid-term goal, 1-2 years:* An increased number of manager specific field days happen in the next two years for individuals to get first-hand experiences with new varieties of fine fescues and see how they can perform in different circumstances.
  - d. *Mid-term goal, 2-3 years:* The team is working on ideas for increasing the volume of on-site trials so managers can test out fine fescues on their land in local conditions. The team will provide initial seed as well as the support of extension staff to help in establishment and maintenance guidance post-establishment.
4. *Managers said any shift to fine fescues requires a comparative cost-analysis across site-specific turfgrass options to convince them and then convince their bosses.*
- a. *Mid-term goal, 1-2 years:* The team already has several on-going studies and studies starting soon that will help in quantifying such costs related to fertilizer and water use as well as mowing requirements for fine fescue.
  - b. *Long-term goal:* A comprehensive cost analysis needs to be undertaken covering the following areas: a) cost of seed/establishment, b) maintenance costs, and c) increased value of improved turf in hard to maintain areas. All of these need to be conducted and presented in comparison to other turfgrass varieties or existing varieties and practices on-site.

#### **Acknowledgments:**

Contributions from NIFA-SCRI 2017-03196 Advisory Board members and research team members from six campuses about available and future research and all focus group participants for their time and input.

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**Let us know if you have any questions or comments.**  
**To follow updates as they happen visit: [lowinputturf.umn.edu](http://lowinputturf.umn.edu)**

## Fine Fescue Establishment and Management Protocol

### 2017 Specialty Crop Research Initiative

#### Introduction

Fine fescues represent a category of low-input grasses that are often utilized in northern climates for creating aesthetically pleasing lawns under minimal maintenance. The successful creation of attractive fine fescues in a lawn setting requires proper establishment and management practices, which can often differ from traditional species such as Kentucky bluegrass, perennial ryegrass, and tall fescue. This protocol is meant to serve as a basic guide for the conversion from existing cool-season grasses to new stands of fine fescue. This process should be completed no later than the recommended planting date in your location. In St. Paul, MN our last date for planting is September 15<sup>th</sup>.

#### Steps for Establishment

1. Identify an area of your campus grounds that will be suitable for converting to fine fescues. The approximate size of the area to convert should be approximately 250ft<sup>2</sup> (for example, 16ft x 16 ft.) or larger. This area should currently contain existing cool season grasses that will be killed off during the conversion process. Maintaining existing stands of other grasses around this new trial area will help to demonstrate the different traits of this newly planted stand.
2. Non-selective vegetation control (1<sup>st</sup> application): Approximately 2 weeks before the initial planting date, an application of glyphosate should be made to control the existing grasses. Follow all label procedures for a proper application, which will include water carrier volume, active ingredient rate, rainfall period, wind restrictions, etc. Use the label application rate for the most difficult grasses that you are trying to control. For example, the Roundup Pro Concentrate label recommends a rate of 1.6 QT/A to control Kentucky bluegrass and up to 4 QT/A to control fescues- in this case the 4 QT/A application rate should be used if your stand contains fescues.
3. Non-selective vegetation control (2<sup>nd</sup> application): Approximately 7 days after the initial glyphosate application, apply a 2<sup>nd</sup> application at the same label rate.
4. Seedbed preparation: Preparation of the seedbed can begin approximately 7 days after the 2<sup>nd</sup> application of glyphosate (assuming that complete control of the existing grasses was achieved). For this, initially mow the dead vegetation down to a height of approximately 1" and removed all of the debris and cut leaf tissue. Soil disturbance can be conducted by the use of a power rake or aerator. Power rakes have vertical blades that cut into the dead canopy to disturb the soil. Video examples on how to use each piece of equipment can be found at the following links:

Power rake: <https://z.umn.edu/powerrake>

Aerator: <https://z.umn.edu/aerator>

If you choose an aerator like the one shown in the video, be sure to go over the area several times such that spacing between holes is no greater than 2"

5. Seeding: Evenly apply the fine fescue seed provided by the use of a drop spreader, such as a Gandy. Fine fescue seed is fairly large and broadcast spreaders will also work if a drop spreader is not available. Seeding rate should be 5 lb/1000ft<sup>2</sup>. Lightly incorporate the seed into the soil by the use of a leaf rake.
6. Fertilizing: A starter fertilizer should be applied following raking of seed at a rate of approximately 1 lb nitrogen, 1 lb phosphate, 1 lb potash per 1000ft<sup>2</sup>. Fertilizers with balanced nutrient percentages will work well for this; for example- 10-10-10 or 14-14-14. If your starter fertilizer contains a greater percentage of phosphorus compared to nitrogen and potassium (ex: 12-24-14), apply at a rate of 1 lb phosphorus per 1000ft<sup>2</sup>. A 10-10-10 product should be applied at 10 lbs of product per 1000ft<sup>2</sup> to achieve the 1 lb rate of nutrients, and a 12-24-14 should be applied at approximately 4lbs of product per 1000ft<sup>2</sup> to achieve 1 lb of phosphorus. Make a second application at the same rate of starter fertilizer approximately 2 weeks after seeding.
7. Erosion control: Protecting the seed from erosion should not be a concern for flat areas with dead vegetation present. The dead vegetation will serve as a control for erosion. For sloped areas with significant soil exposed, you will want to protect the seed from movement by the use of erosion control

blankets. There are many options on the marketplace for erosion control, choose the one that you are most familiar with and have used in the past. Most blankets will contain wood or straw fibers.

8. Irrigation: The seedbed must be kept moist during the germination process. This is critical. To maintain moisture, irrigate the area multiple times per day during the first week. Generally we suggest three irrigation cycles spaced evenly throughout the day. For example, set up irrigation to run at 8am, noon, and 4pm. Application rates should be approximately 0.10" of water during each irrigation cycle. Fine fescues will germinate anywhere from 4-8 days. Following good germination, reduce irrigation initially by adjusting the frequency to 2x per day for 5-7 days, followed by 1x per day until irrigation can be withheld. This assumes no rainfall- be sure the area does not stay constantly wet (maintain moisture but not saturation) and withhold irrigation when rainfall is sufficient.

#### General Timeline for Establishment

Day 1: 1<sup>st</sup> glyphosate application

Day 7: 2<sup>nd</sup> glyphosate application

Day 14: seedbed preparation, seeding, fertilizing, watering

Days 14-21: irrigation 3x per day

Days 22-27: irrigation at 1-2x per day

Day 28: 2<sup>nd</sup> fertilizer application

Day 28 and on: maintain moisture such that seedlings are not overwatered (this will help them mature) and not drought stressed. If drought stress occurs at this point, recovery will be slow.

The following link will direct you to a series of 7 short videos on this process:

Videos: <https://z.umn.edu/establishment>

#### Maintenance of Newly Planted Fine Fescues

The first maintenance conducted will be the initial mowing in the fall of 2017. Maintenance practices for the 2018 growing season will include mowing, fertilizing, irrigating, handweeding, and possibly aerating.

- Mowing- Initially mow the seedlings when they reach the desired height of cut. For this area, heights of cut can range from 2.5 to 4" (do not mow at less than 2.5"). Mowing in the fall of 2017 will help to improve density of the stand and control weeds. Continue to mow into the fall until this area stops growing- do not lower heights before winter. In the spring of 2018, if significant dead leaf growth appears on the surface, consider raking this up prior to the initial mowing. For mowing frequency, follow the 1/3 guide- do not remove any more than 1/3 of the stand at any one mowing. For example, if the height of cut is 3", mow before the height of cut reaches 4.5". Fine fescues do not like to be mowed in the heat of the summer and they will not be growing much. Do not mow when temperatures are forecasted to exceed 85°F for extended periods- significant stand loss can occur if this happens. We find that fine fescues maintained at 3" only need to be mowed 1-3 times in the month of July.
- Fertilizing- Fertilizing should be conducted two times during the growing season of 2018. Each application should provide 1 lb of nitrogen per 1000ft<sup>2</sup>. Make one application in the spring (late-May in Minnesota) and one in the fall (early September in Minnesota). Fertilizers chosen should contain at least 50% of the nitrogen in the slow release form. Water fertilizer applications in with approximately 0.10" of water. All other nutrients, such as phosphorus and potassium, should be applied based on a soil test.
- Irrigating- Fine fescues are surprisingly drought tolerant and require very little water in the right environment. However, since this is a new stand, irrigation must be managed to prevent dormancy or dieback. If rainfall does not occur for approximately 5-7 days, consider irrigating to maintain stand integrity.

Sam Bauer 7/2017

- Weed control- Assuming adequate establishment and no spring overseeding required, consider applying preemergent herbicides for the prevention of summer annual weeds, like crabgrass. All post-emergent applications should be avoided on this new stand. Broadleaf and grassy weeds should be removed manually by hand.










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- Hot Topics**
-  Weed of the month for September 2013 is Nimblewill
  -  Weed of the month for March 2015 is Tall Fescue
  -  Weed of the Month for July 2013 is Goosegrass
  -  Weed of the month for June 2015 is Quackgrass
  -  Weed of the month for August 2014 is Prostrate Spurge
  - Weed of the Month for May 2015 is Orchardgrass

## Fescue. You mean there's more than one kind?

Monday, August 18, 2014

Typical conversation about fescues.

Bill: What kind of grass do you have?  
 Bob: Fescue.  
 Bill: What kind of fescue?  
 Bob: You mean there's more than one kind?  
 Bill: Yes.

As I travel around the region and give presentations or respond to email and phone questions, it is very common for me to enter into a dialogue with a person about planting, maintaining, controlling, etc. some kind of fescue. Usually in my interactions with people, they are unaware that there are many different kinds of fescues.

*Festuca* is the genus (first word in scientific name) for fescue species. Hence, *Festuca's* are name Fescue. However, recently tall and meadow fescue were reclassified by scientists into the genus *Schedonorus* (see table below) although they still retain their same common name of fescue. Tall fescue and meadow fescue are similar with meadow fescue being used sparingly for overseeding in warm-season turf or as a forage grass and tall fescue commonly being used in lawns, roadsides and pastures. The remaining fescues including slender creeping red fescue, strong creeping red fescue, Chewings fescue, sheep fescue, blue fescue, and hard fescue are often grouped together and called "fine fescues" because of their narrow (fine) leaves. Another reason for grouping them all together is because they are difficult to distinguish from one another. Blue fescue is another fine fescue species used as an ornamental landscape grass.

Below is a breakdown of the common (and a few not so common) fescues used in turf (and ornamentals) and a short description of each.

Table 1. Description of the common and uncommon fescues used in turf (and ornamentals).

Common name	Species	Comments
Slender creeping red fescue	<i>Festuca rubra</i> ssp. <i>littoralis</i>	Similar to strong creeping red fescue but with shorter, more slender rhizomes. Both slender and strong creeping red fescue tolerate some close mowing.
Strong creeping red fescue	<i>Festuca rubra</i> ssp. <i>rubra</i>	Strong creeping red fescue has more rhizome growth (spreading ability) than slender creeping red fescue. Strong creeping red fescue is a common ingredient in "Sun & Shade" mixes because of its good shade tolerance and its suitability in seed mixtures.
Chewings fescue	<i>Festuca rubra</i> spp. <i>fallax</i>	Named after George



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    - Words You Might Hear a Turf Nerd Use
    - Weed of the month for August 2014 is Prostrate Spu...
    - Plant Turf Seed or Control Weeds First?
    - Fescue. You mean there's more than one kind?
    - Start Seeding Cool-Season Turf Now
    - Watering Newly Seeded Areas
- ▶ July (7)
- ▶ June (4)
- ▶ May (4)
- ▶ April (10)
- ▶ March (6)
- ▶ February (2)
- ▶ January (4)
- ▶ 2013 (45)
- ▶ 2012 (49)
- ▶ 2011 (57)

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		Chewings. Excellent shade tolerance and turf density, this fine fescue is similar to creeping red fescue but it lacks rhizomes.
Tall fescue	<i>Schedonorus arundinaceus</i> (Schreb.) Dumort. (also = <i>Lolium arundinaceum</i> (Schreb.) S.J. Darbyshire; formerly = <i>Festuca arundinacea</i> Schreb.)	Improvements in tall fescue have transformed this grass from a forage type grass to many improved turf-type cultivars. Today, both "forage" and "turf-type" tall fescue are used. Kentucky-31 (KY-31) is a forage type and not a lawn type. Known for its ability to maintain green color during moderate droughts due to its deep root system, tall fescue is more commonly used today on lawns than in the past.
Sheep fescue	<i>Festuca ovina</i>	Excellent drought tolerance. This fine fescue with fair turf density does not tolerate close mowing. It is often used in unmown, "native" areas of golf courses.
Blue fescue	<i>Festuca glauca</i>	Ornamental grass. Common variety is 'Elijah blue'
Meadow fescue	<i>Schedonorus pratensis</i> (Huds.) P. Beauv. (formerly <i>Festuca pratensis</i> Huds.)	Similar in appearance to tall fescue. Little current use in high value turf.
Hard fescue	<i>Festuca brevipilla</i>	Excellent shade tolerance, this fine fescue does not tolerate close mowing. It is often used in unmown, "native" areas of golf courses.
Red fescue	<i>Festuca rubra</i>	Today, red fescue is classified into two groups: 1) Slender creeping red fescue or 2) Strong creeping red fescue. However, some seed labels may still just say, red fescue.



Figure 1. Unmown, fine-fescue used on a golf course. These areas are often described as no-mow, native areas, or environmentally sensitive areas to the golfers.



Figure 2. Chewings fescue. Notice the fine leaf texture (narrow leaf width) compared to tall fescue below.

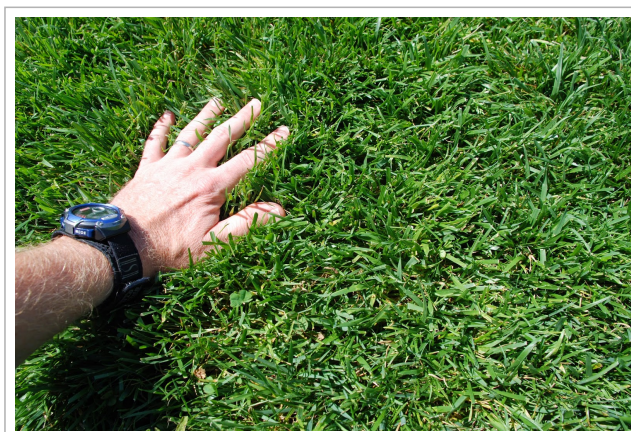


Figure 3. Tall fescue (turf-type).

Aaron Patton, Turfgrass Extension Specialist

Posted by Purdue Agronomy at 10:45 AM | Labels: Aaron Patton

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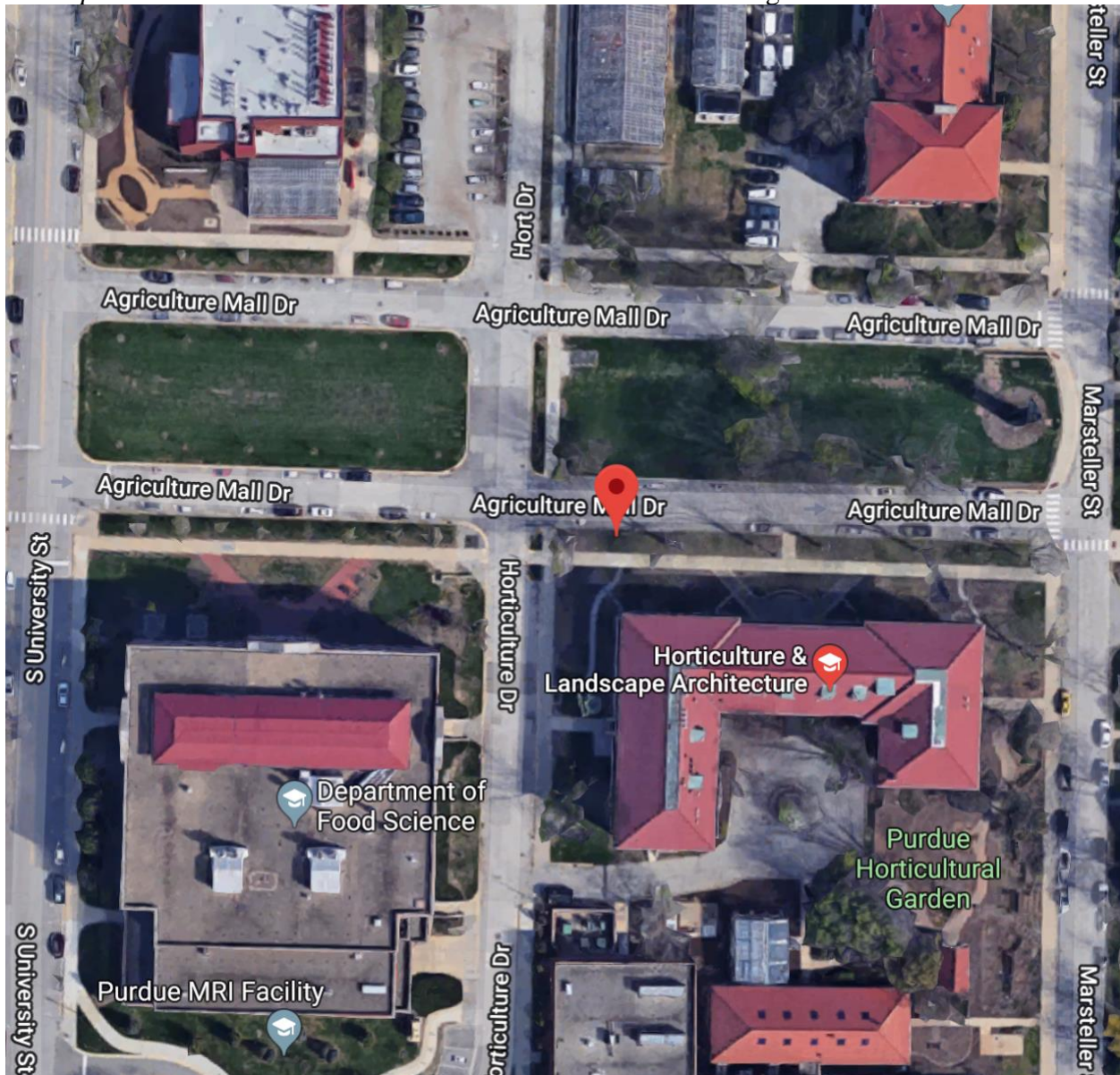
**Background:** This document provides a list of the demo plot locations installed as part of the NIFA-SCRI 2017-03196 grant. Location information provided is as specific as possible to allow for individuals to visit the sites without assistance.

Link to [Online Google Maps Version](#)

### **Purdue University**

*Address:* 625 Agriculture Mall Dr., Purdue University, West Lafayette, IN 47907

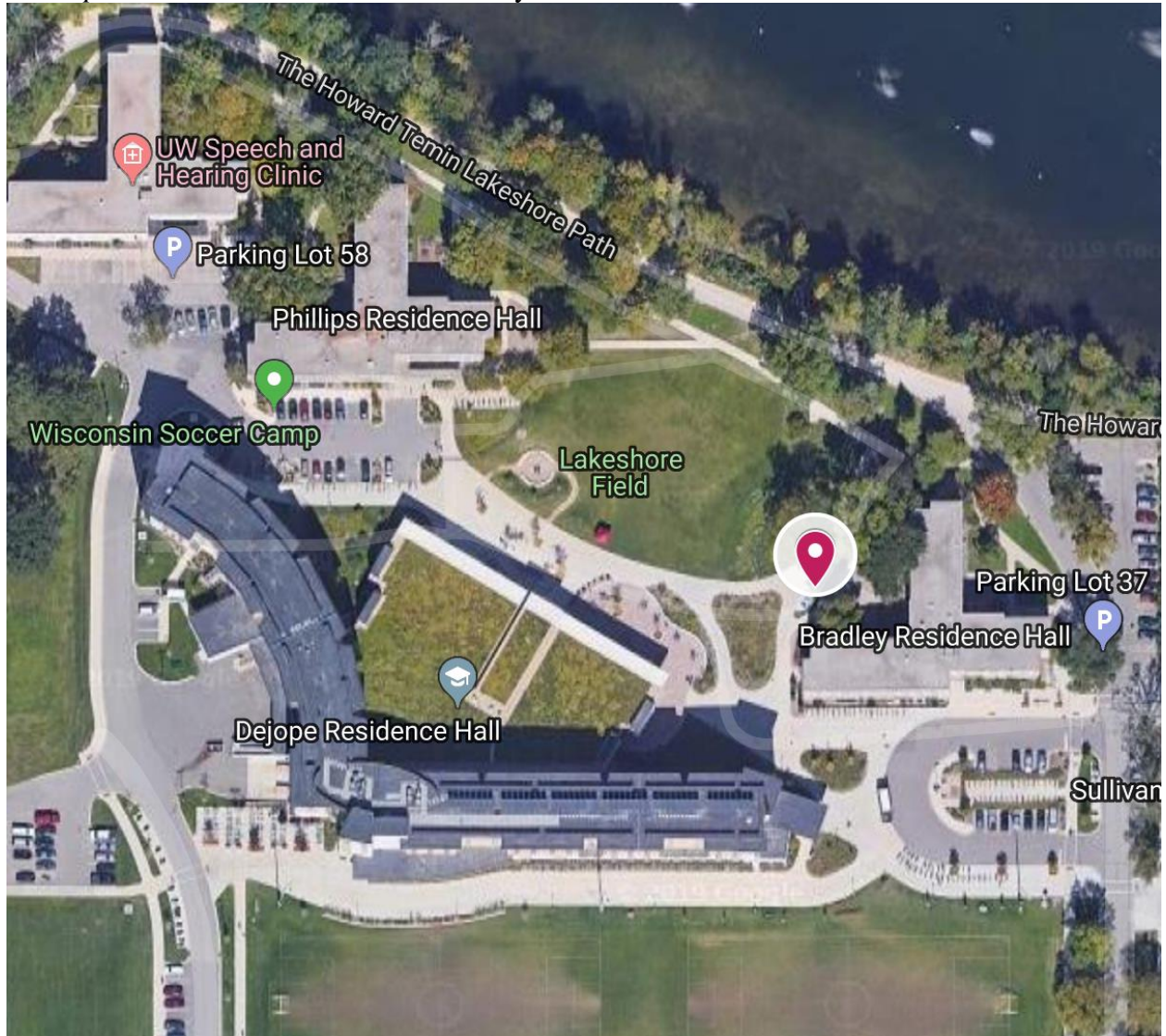
*Description:* Near the northwest corner of the Horticulture Building



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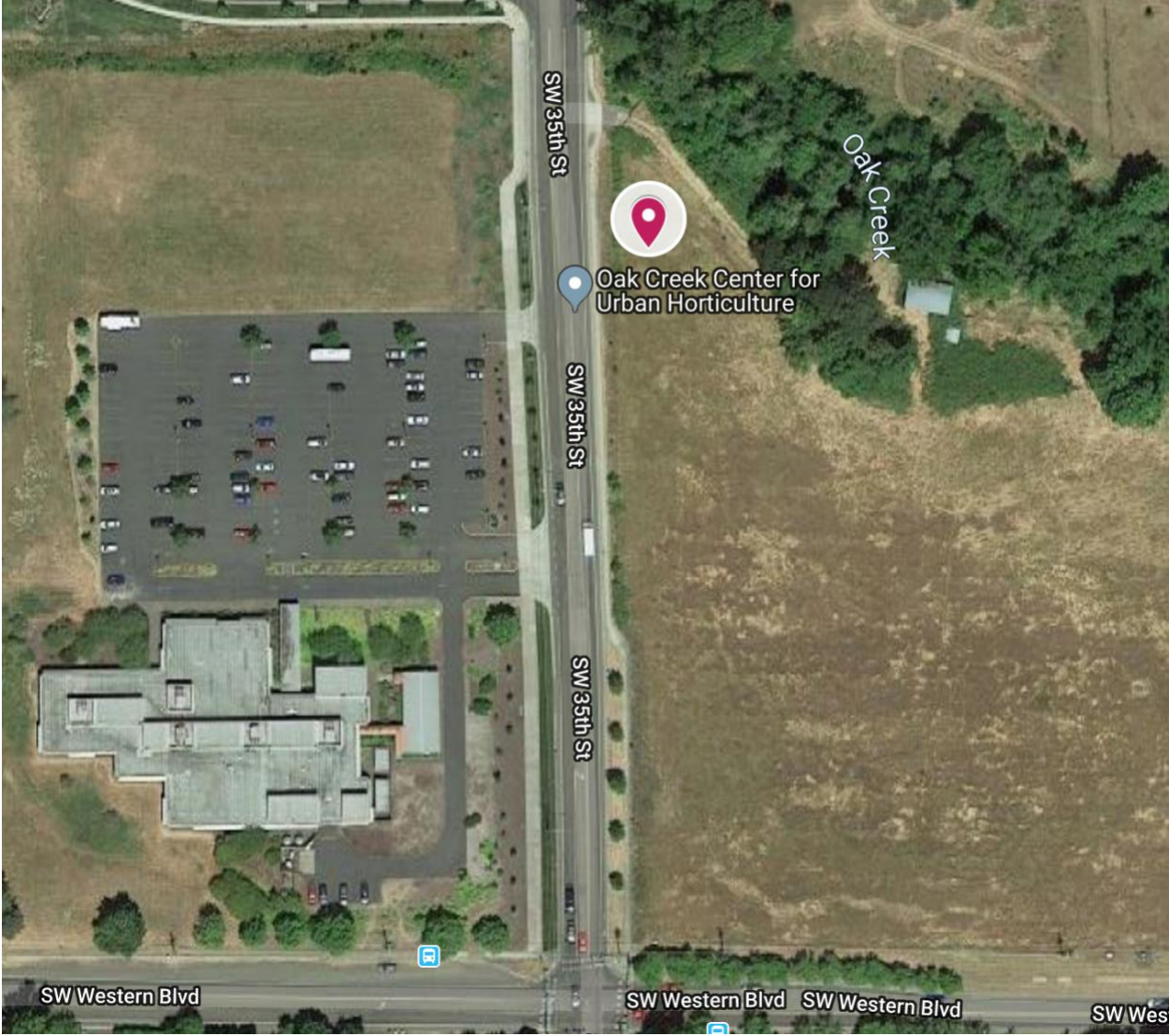
*Description:* On the western side of Bradley Hall



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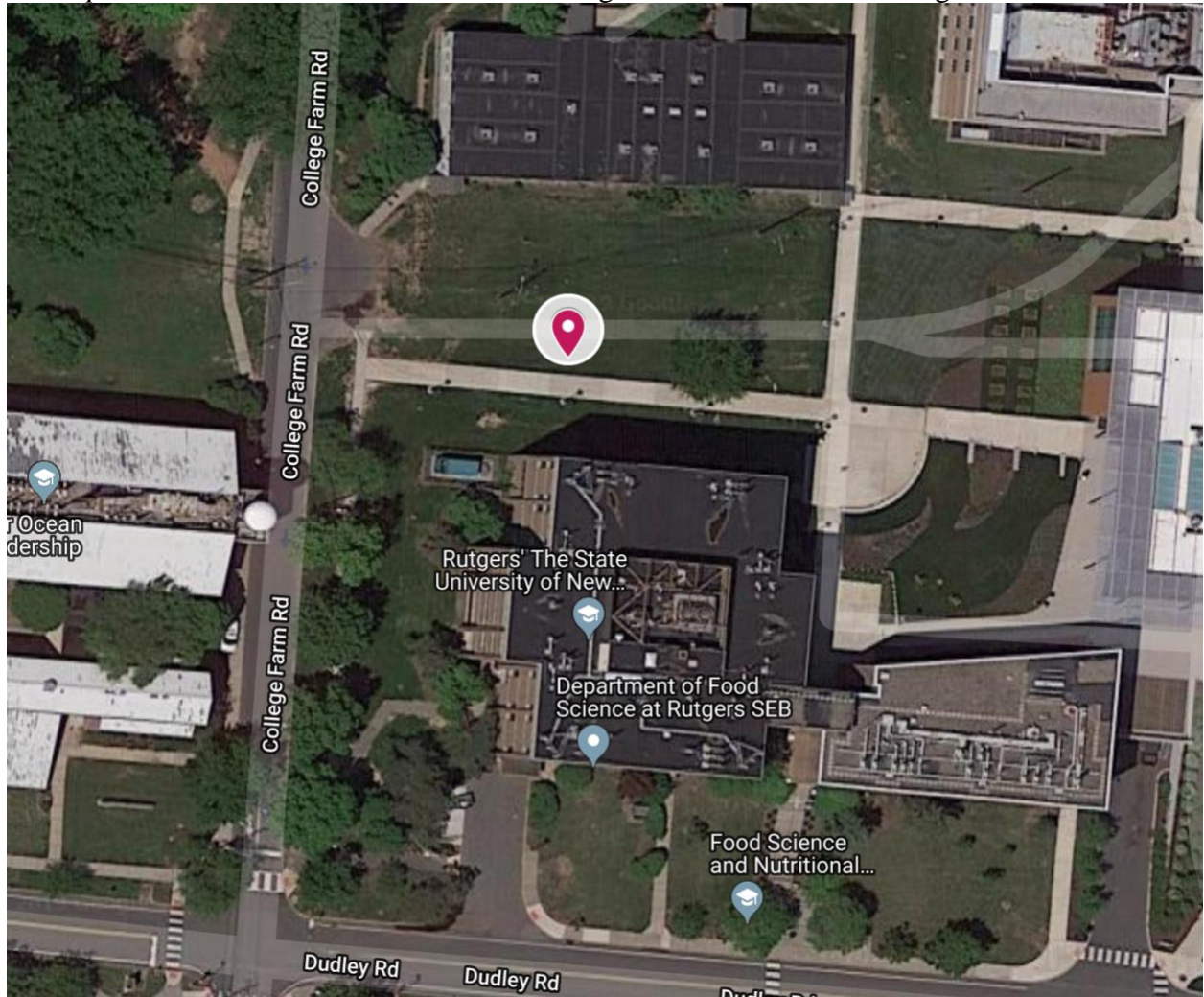
*Description:* Near apiary.



**Rutgers University**

Address: 65 Dudley Rd #107, New Brunswick, NJ 08901

Description: North side of Food Science building between it and Cook Douglass Lecture Hall

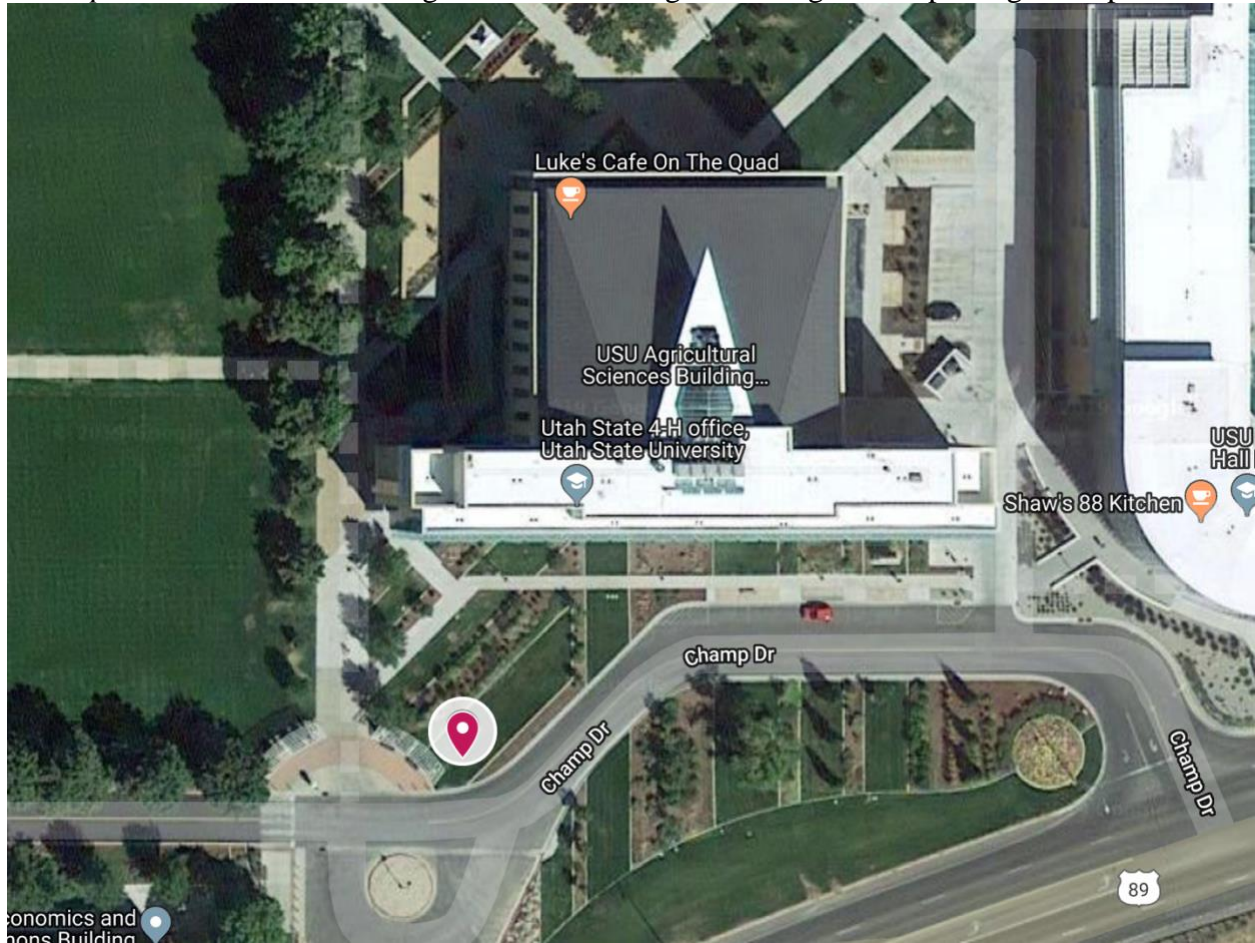




**Utah State University**

*Address:* Agricultural Sciences Building, Champ Dr., Logan, UT 84322

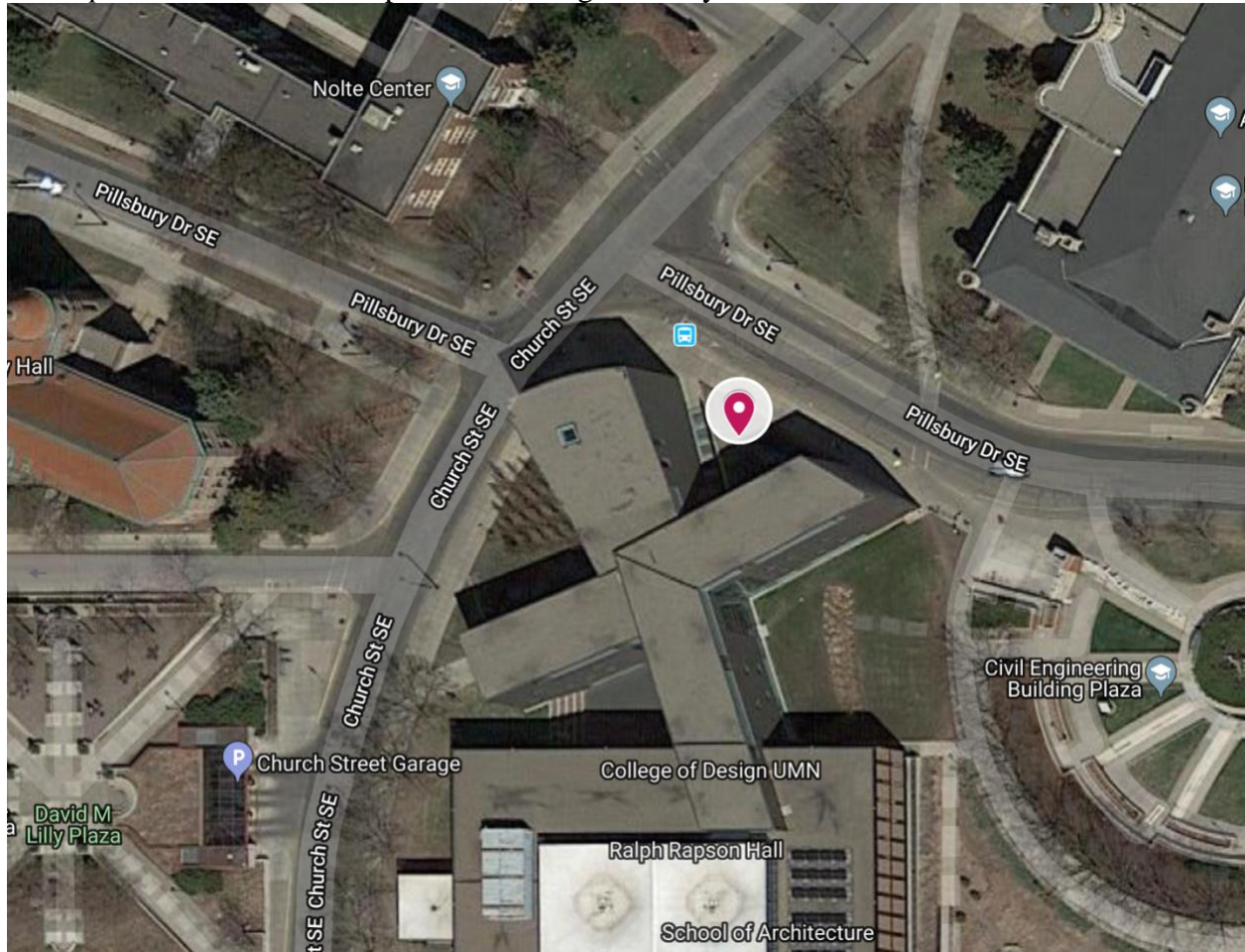
*Description:* South side of the Ag. Sciences building in the diagonal strip along Champ Rd.



**University of Minnesota Twin Cities**

*Address:* Ralph Rapson Hall, 89 Church St SE, Minneapolis, MN 55455

*Description:* North side of Rapson Hall, along Pillsbury Dr.



# RUTGERS COOPERATIVE EXTENSION

NEW JERSEY AGRICULTURAL EXPERIMENT STATION

## **Fine Fescues: Low-Maintenance Species for Turf**

*James A. Murphy*

*Extension Specialist in Turfgrass Management*

Fine fescues are a group of cool-season grasses which will generally grow well under low-maintenance situations. Fine fescues are named for their characteristic fine, bristle-like leaves and are well adapted to dry, infertile soils. Fine fescues are frequently mixed with Kentucky bluegrass and perennial ryegrass seed. Hopefully one or more of the components of such a seed mixture will be capable of adapting to the large variety of environmental conditions found throughout New Jersey and the surrounding region.

There are five species of fine fescues utilized for turf, which include creeping red fescue, Chewings fescue, hard fescue, sheep fescue, and blue fescue. Creeping red fescue spreads by rhizomes and is broken into two subspecies, strong creeping red fescue having relatively long vigorous rhizomes and slender creeping red fescue having smaller, weaker rhizomes. There is some discrepancy about the separation of hard fescue, sheep fescue, and blue fescue into distinct species but they are all bunch-type grasses and have a dense, compact growth habit. Thus, these fescues have limited spreading ability through tillering.

### **General Uses**

Three species of the fine fescues, strong creeping red fescue, Chewings fescue, and hard fescue are useful for turf where well-drained soil exists, low fertilization is expected, and a medium level of shade is likely.

**Hard Fescue.** This turfgrass species forms a dense, fine leaf, moderately low growing turf with a moderately slow rate of establishment. Hard fescues perform well under low maintenance and grow especially well in dry, infertile soils. Hard fescues will maintain good color during droughts of moderate length. They will frequently dominate other cool season turfgrasses such as Kentucky bluegrass under such environmental conditions. The hard fescues are generally considered more heat tolerant than Chewings fescue. The use of endophyte enhanced seed will produce a turf that can have greater tolerance of some foliar pests. Listed below are varieties recommended for New Jersey based on turf trials throughout the state.

Attila	Nordic	SR 3000
Aurora	Ospery	SR 3100
Biljart	Reliant	Valda
Brigade	Reliant II	Vernon
EcoStar	Scaldis	Waldina
Discovery	Spartan	Warwick

**Chewings Fescue.** Chewings fescue tends to have a bright, medium green color while hard fescues often have a dark green color. Chewings fescue forms a fine, dense, moderately low-growing turf. Chewings fescues are tolerant of moderately low maintenance and tend to develop more thatch than the creeping red fescues. The newer varieties are more aggressive and can dominate in a seed mixture. Listed below are varieties recommended for New Jersey based on turf trials throughout the state.

Banner II	Proformer	SR 5100
Bridgeport	Sandpiper	SR 5000
Brittany	Shadow	Tiffany
Eco	Shadow II	Treasure
Jamestown II	Southport	Victory
Longfellow		

**Strong Creeping Red Fescue.** This species is the most compatible of the fine fescues when mixed with Kentucky bluegrass. Strong creeping red fescues require a medium level of maintenance and are highly susceptible to diseases such as red thread and dollar spot. This species has the greatest seedling vigor of the fine fescues. Listed below are varieties recommended for New Jersey based on turf trials throughout the state.

Cindy	Salem	Shademaster II
Flyer	Shademaster	Vista
Jasper		

**Sheep and Blue Fescue.** Sheep and blue fescues form open, wiry turfs and frequently have a grey or blue color rather than green. This color difference is often considered objectionable when mixed with other cool-season grasses having a brighter green color. However, some people find the grey and blue color attractive when used in ornamental plantings and wildflower mixtures. These fescues do not out-compete wildflowers because of their nonaggressive, bunch-type growth. Listed below are varieties recommended for New Jersey based on turf trials throughout the state.

Azure	MX-86
Bighorn	Quatro

## Maintenance Requirements

As a group, fine fescues perform better than most other cool-season turfgrasses under low maintenance, often producing a long-lasting turf cover that can survive several years without fertilizer input after the turf is established. Fine fescues will out-

perform other cool-season grasses under trees when there is competition for water, nutrients, and light. Fine fescues can grow well in environments of cool, dry shade but will not persist on wet sites. High nitrogen fertility and close, frequent mowing decrease the summer heat tolerance of these grasses. Damage from insects and diseases tends to increase under higher levels of maintenance and during the hot, humid periods of summer. Therefore, high maintenance programs are not appropriate for turfs having a significant proportion of fine fescues. Nitrogen fertility should not exceed 2 pounds of actual nitrogen per 1000 ft<sup>2</sup> per year and irrigation is not needed when summer dormancy is not objectionable. Fine fescues should not be mowed below a height of 2½ to 3 inches.

General observations from numerous variety trials indicate that hard fescues tend to have the best overall performance of the fine fescues. This is especially true under low maintenance. However, under somewhat more intensive management the performance of the Chewings fescues improve. The resistance of the hard fescues to the disease, red thread, is one reason for its better performance under low maintenance. Under higher maintenance, Chewings fescue shows less damage from the root-infecting disease, summer patch, than the hard fescues. More specific and up-to-date information on the performance of the fine fescue species and varieties can be found in the *Rutgers Turfgrass Proceedings* (published annually).

Fine fescues containing endophyte show remarkably improved resistance to insects such as chinch bug. Endophyte refers to a plant (fungus) living within a plant. The endophytic fungus partly provides insect resistant to the fine fescue grass plant. This feature of biological insect control in some fine fescues combined with the good drought tolerance make these grasses an attractive alternative when reduced pesticide input and water conservation are important issues in a landscape.