Mowed and Non-Mowed Fineleaf Fescue Performance When Irrigated with Recycled Water

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Fineleaf fescue species have been available for turf use since the 1930s, but most of them did not come to the market in large volume until 30 years later. Several improved cultivars were introduced after 1970. Recently, however, due to the low-input, low-maintenance nature of these versatile species, many new cultivars of fineleaf fescue species have found their way to the turfgrass market and are becoming popular low-maintenance choices for a variety of uses.

The most common botanical categorization of fineleaf fescues, all of which are perennial, cool-season grasses, includes four distinct species: creeping red fescue *(Festuca rubra)*; Chewing fescue *[F. rubra ssp. fallax (comutata)]*; sheep fescue *(F. ovina ssp. hirtula)*; and hard fescue *[F. longifolia (brevipila)]*. Of these four, creeping red fescue, a native of Europe, is the most widely used for turf purposes. It encompasses two distinct types, fine-leaved, low-growing grasses with short, thin rhizomes. These grasses are weak creepers and are therefore slow to fill in bare areas. They are commonly known as slender creeping red fescue *(Festuca rubra var. littoralis)*.

The second type of creeping red fescue is a strong creeper *(Festuca rubra ssp. rubra)* with long, spreading rhizomes and wider leaves. This type is not as tolerant of close mowing and grows less densely than the slender type. However, excellent seedling vigor makes strong creeping red fescues particularly valuable as companion grasses during turf establishment.

Both types of creeping red fescue are adapted to well-drained, dry and moderately shaded sites; they are especially intolerant of wet conditions. Most require minimal levels of nitrogen and a pH of 5.5 to 6.5. Cutting heights of 1 to 2.5 inches are common; higher heights are preferred under shady conditions.

Chewings fescue, also native to Europe, is low-growing, and without rhizomes. It is a bunch-type grass which spreads very slowly, even under mowing, by basal tillering. It tolerates mowing as close as 1 to 1.5 inches where summers are cool; in warmer areas, mowing heights of 2 to 3 inches are best. Chewings fescue forms a denser turf than creeping red fescue, especially under close mowing. It does not tolerate extremes in temperature but does tolerate shade and drought well. It is adapted to well-drained, coarse-textured, acidic, and infertile soils.

Sheep fescue, a noncreeping bunch-type grass with tufted, stiff, bluish-green leaves, is indigenous to North America and Eurasia. It forms a relatively low quality turf and has not been widely used for turfgrass purposes. Its main use is stabilization of welldrained, droughty, coarse-textured, acid soils of low fertility. It is not adapted to either close mowing or intensive culture.

Hard fescue, a native of Europe, is also a noncreeping bunch-type

FINELEAF FESCUE *(Continued)*

grass similar to sheep fescue but with tougher, wider and greener leaves. Its drought tolerance is less than that of sheep fescue but better than that of creeping red fescue. It is quite deep-rooted and has a high root-to-shoot ratio, a major reason for its drought tolerance. Hard fescue is shade tolerant but does not adapt to close mowing. Nonmowed hard fescues are attractive ground covers and often used for soil stabilization on roadsides and ditch banks, and for minimum maintenance and nonuse areas.

Fine fescues are used as mono-stands (i.e., not in a mixture with other turf species) in several regions of the northern most of the United States, but are often unsuccessful as mono-stand turf in California, especially the greater San Francisco Bay Area. Shade tolerant, they are often used in seed mixtures (with bluegrass and ryegrass) in shady or semi-shady sites. As mowed mono-stands of turf, with the exception of the mountainous regions they do not produce a quality stand year-round in most parts of California, especially in full sun.

The results of a 1988 study in the San Francisco Bay Area revealed superior performance by several cultivars of finefescue. In particular, several hard fescue cultivars performed so well that we recommended them as non-mowed, low maintenance turfgrass ground cover for Northern California. Since then, large acreages of hard and other fineleaf fescues have been planted throughout the region. Our post-1988 studies in the San Francisco Bay Area revealed that fineleaf fescues could be grown and transplanted successfully as sod. As a result, in addition to seed, several mixture of fineleaf fescues are currently available in sod form and are marketed an "no-mow" type lawns.

Due to their popularity, many new and improved fineleaf fescues have been brought to market. To learn more about these low maintenance and drought tolerant grasses and determine their suitability and performance under California's Central Coast climate, we initiated a comprehensive trial in 2003 which concluded in 2007. This report presents the summary of findings from the combined data of this 4-year study.

Fifty-three finefescue cultivars supplied by NTEP (Table 1) were planted in October 2003 and were rated monthly through 2007 for overall quality (turfscore) under both mowed and non-mowed conditions. The study included several cultivars each of creeping red fescue, Chewings fescue, hard fescue, and one cultivar of sheep fescue.

Plots were established at a dedicated spot at the Palo Alto Municipal Golf Course in full sun. All cultivars were planted on native soil at the rate of 4.4 lb/ 1000 ft^2. Seed was broadcast by hand, then raked in. Plot soil chemical and physical characteristics are summarized in Table 2. A starter fertilizer was applied at the time of seeding to provide 1 lb each of nitrogen (N), phosphorous (P) and potassium (K) / 1000 ft^2.

Cultivars were planted in a randomized, complete-block design, on 3 ft x 8 ft plots with 3 replications. Half of each 24 ft^2 plot was mowed at 2 inches weekly, and the other half was left non-mowed for the entire trial period. Turf quality ratings were recorded separately for each plot, for both the mowed and non-mowed turf. Plots were irrigated as needed with a 50/50 blend of domestic and recycled water (Table 3), for the entire course of the study. Due to environmental restrictions at the golf course, no pesticide of any kind was applied to the plot. Weed control was limited to occasional "hand pulling" of weeds. Seasonal application of fertilizer provided approximately 2 lbs of N, 1 lb of P, and 1 lb of K per 1000 ft^2 per year.

Table 1 presents overall results at the end of the fourth year. Ratings are the averages of 4 years' monthly ratings (2004-2007). Ratings fall on a scale of 1-9, with 9 representing the superior cultivars for overall quality. Cultivars are ranked in Table 1 from highest overall quality score to lowest.

FINELEAF FESCUE *(Continued)*

Our data revealed the following about the use of fineleaf fescues as mono-stand, mowed or non-mowed turf grown in full sun in Central Coastal California and irrigated with municipal recycled water:

- All cultivars remained green throughout the year. None experienced dormancy at any time during the year.
- Collectively, non-mowed finefescue cultivars received higher turfscores (6.1 to 8.1) than when they were mowed (5.5 to 7.3). Generally, a turf stand receiving a turfscore of below 6.0 is considered unacceptable.
- In our past trials, hard fescue cultivars were top performers among the finefescues. This trial modified that trend, as many strong creeping red fescues appear at the top of the performance list, under both mowed and non-mowed regimes. Hard fescue cultivars (plus the lone sheep fescue) received the lowest turfscore under both mowing regimes.
- No disease activity was evident on any of the cultivars during the course of the study. No fungicides were used during this trial either as preventative or cure.
- Although finefescue cultivars were planted on clay soil and irrigated with a moderately saline recycled water (EC of 1573 micromhos/ cm), they generally performed well. With the exception of a few mowed hard fescue cultivars and the sheep fescue, they all produced an acceptable turfscore of 6 or higher. Surprisingly, although the recycled irrigation water was moderately saline and sodic (SAR of 5), and had high levels of sodium (197 ppm) and chloride (307 ppm), the soil test results at the conclusion of the study (Table 2) indicate only moderate soil salinity (ECe of 1.43) and sodicity (SAR of 3). It appears hat the Leaching Requirement on this site was met by annual precipitation and perhaps additional irrigation. In a dry year, when natural precipitation and irrigation frequency may be limited and recycled water contains elevated salts, some of these cultivars may not perform as well as they did in this study.
- In conclusion, it appears that the Bay Area Turf and Landscape Industry now has many high performing fineleaf fescues for use in a landscape to be irrigated with moderately saline water, especially if the grasses are left non-mowed.

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Table 1: Combined 4-Year Mean Overall Turf Quality (Turfscore) for Mowed and Non-Mowed Fineleaf Fescue Cultivars/Species.

Cultivar	Species	Mowed		Non-Mowed	
		Turfscore	Rank	Turfscore	Rank
FORTITUDE	STC	7.3	1	7.3	8
CARDINAL	STC	7.2	2	7.7	4
EPIC	STC	7.2	2	7.8	3
WENDY JEAN	STC	7.0	3	8.1	1
BMXC-S02	STC	6.9	4	7.9	2
C-SMX	STC	6.9	4	7.8	3
COMPASS	C	6.9	4	7.5	6
CELESTIAL	STC	6.8	5	7.1	10
DAWSON E	SLC	6.8	5	7.7	4
DP 77-9885	C	6.8	5	6.6	15
DLF- RCM	STC	6.7	6	7.8	3
GARNET	STC	6.6	7	7.4	7
J- 5	C	6.6	7	7.6	5
MUSICA	C	6.6	7	7.2	9
C03- 4676	STC	6.5	8	6.9	12
CLASS ONE	STC	6.5	8	7.8	3
IS- FRR 23	STC	6.5	8	7.5	6
JASPER II	STC	6.5	8	7.5	6
LACROSSE	C	6.5	8	6.6	15
RAZOR	STC	6.5	8	6.9	12
SHADEMASTER	STC	6.5	8	7.6	5
CASCADE	C	6.4	9	7.3	8
DP 77-9360	STC	6.4	9	7.3	8
DP 77-9578	STC	6.4	9	7.8	3
LONGFELLOW II	C	6.4	9	7.5	6
ORACLE	STC	6.4	9	7.0	11
PATHFINDER	STC	6.4	9	7.3	8
SHORELINE	SLC	6.4	9	7.4	7
SPLENDOR	STC	6.4	9	7.2	9
SR 5130	C	6.4	9	6.7	14
TL1	STC	6.4	9	7.3	8
ZODIAC	C	6.4	9	7.0	11
AMBASSADOR	C	6.3	10	6.8	13
CULUMBRA II	C	6.3	10	7.4	7
DP 77-9579	STC	6.3	10	7.4	7
SEABREEZE	SLC	6.3	10	7.3	8
7 SEAS	C	6.2	11	6.9	12
BOREAL	STC	6.2	11	7.4	7
DP 77-9886	C	6.2	11	6.6	15
PST- 8000	STC	6.2	11	6.7	14
RELIANT IV	H	6.2	11	7.3	8
TREAZURE II	C	6.2	11	7.0	11
SPARTAN II	H	6.1	12	6.1	18
AUDUBON	STC	6.0	13	7.0	11
BERKSHIRE	H	6.0	13	6.7	14
OXFORD	H	6.0	13	7.2	9
PREDATOR	H	6.0	13	6.1	18
SR 3000	H	6.0	13	7.0	11
SRX 3K	H	6.0	13	6.7	14
FIREFLY	H	5.8	14	6.3	16
SCALDIS	H	5.8	14	6.1	18
QUATRO	S	5.6	15	6.2	17
GOTHAM	H	5.5	16	6.2	17
LSD (0.05)	—	0.8	—	0.7	—

Notes: STC: Strong Creeping Red Fescue; SLC: Slender Creeping Red Fescue; C: Chewings Fescue; H: Hard Fescue; S: Sheep Fescue; LSD: Least Significant Difference. To determine statistical differences among cultivars, subtract one cultivar's turfscore from another's turfscore. Statistical differences occur when this value is greater than the corresponding LSD value. If the difference between the turfscore for two cultivars within the same column is not greater than corresponding LSD, then the two cultivars are statistically the same, regardless of their ranking.

FINELEAF FESCUE *(Continued)*

Table 2: Plot Soil Chemical and Physical Characteristics at the Beginning and Conclusion of the Trial*

	pH	ECe	Chloride meq/l	Bicarbonate meq/l	SAR	ESP	CEC	Sand %	Silt %	Clay %
2003	7.9	2.41	8.4	1.5	3	3	19.6	57	28	15
2008	7.5	1.43	2.7	3.5	3	4	24.6	55	26	19

* ECe: Electrical Conductivity of saturated paste extract in dS/m
SAR: Sodium Adsorption Ratio
ESP: Exchangeable Sodium Percentage
CEC: Cation Exchange Capacity

Table 3: Irrigation Water (Recycled Blend) Quality at Palo Alto Golf Course.

Parameter	Unit	Value*
Electrical Conductivity (EC)	micromhos/cm	1573
pH	—	6.9
Sodium	ppm	197
Calcium	ppm	51
Magnesium	ppm	36
Chloride	ppm	307
Boron	ppm	0.33
Chlorine (Residual)	ppm	4.9**
Nitrate Nitrogen (NO_3 -N)	ppm	22
Phosphate (PO_4)	ppm	12
Sulfate (SO_4)	ppm	96
Sodium Adsorption Ratio	—	5

*2005-2007 average
**2007average

NAUMANN'S NORCAL NEWS

P.J. KANER has accepted the superintendent position at Santa Teresa Golf Course in San Jose. P.J. was the assistant superintendent at Los Altos Golf and Country Club under **MICHAEL SIMPSON**. He is replacing **CHRIS DUBAS** who has moved to another position in the industry.

MATT WISELY is the new superintendent at Chuck Corica Golf Complex in Alameda. Matt had been the superintendent at Santa Clara Golf & Tennis Club in Santa Clara. His replacement has yet to be named.

In a sign of the times, Pasadera Country Club in Monterey has just filed for Chapter 11, Bankruptcy Protection. Hopefully, things will get better soon.