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Fine Fescues Are Different

by C. R. Funk and R. W. Duell

The fine fescues are tolerant of acid soils, low fertility and shade. They perform best in cool climates and during cool seasons. Summer performance is not as good as that obtained from the better Kentucky bluegrass varieties unless the fescues are grown in cool, partly shaded locations or in regions having cool summers. Excellent fine fescue lawns can be observed in locations such as England, Holland and the coastal areas of Oregon and Washington where summers are cool.

The fine fescues are intolerant of generous amounts of nitrogen fertilizer in hot weather. In Holland, where summers are moderate, the fine fescues thrive on both heavy and sandy soils. In the United States they generally do very poorly on poorly drained soils and are best adapted to well-drained sandy soils. Dollar spot, a disease not prevalent in Holland, can occur during a wet summer and is temporarily very damaging to fine fescues growing under conditions of moderately poor drainage in New Jersey. Also, other factors associated with wetness discourage this species.

The fine fescues currently showing the greatest potential for turf use can be divided into four major types. In the absence of a clear taxonomic classification, we will refer to them as Chewings, Creeping, Spreading, and Hard fescues.

The Chewings, Creeping and Spreading fescues are currently included in one species, *Festuca rubra* L. However, the three types are very different in appearance, growth habit, management requirements, adaptation, breeding behavior and cytological characteristics. Probably, they should be classified as separate species.

THE CHEWINGS TYPE *F. rubra* L. subsp. *commutata* Gaud., is a fine-leafed, lower-growing grass without rhizomes. Under mowing, these plants may spread slowly by basal tillering.

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Vandalism of Turf and Landscape

Turfgrass sites suffer purposeless damage from cars, motorcycles, abusive play, chopping out "4-letter words," horses, gulls, theft, and various other ways of sabotage. Likewise, the landscape counterparts, trees and shrubs, are broken, stripped, and stolen. On too many sites it is scarcely worthwhile to plant evergreen trees. If they are not stolen soon after planting, many are topped for Christmas trees. More and more frequently, developing an attractive landscape seems useless because of threatened vandalism.

It is not surprising that vandalism is a serious problem. It has always happened, and dissident attitudes of today easily explain the increased trend. Possibly, too few people work with turf and landscape plants, which leaves them with no appreciation for the effort and beauty involved.

While senseless vandalism cannot be excused and those involved should expect severe deterrent measures, there is no direct cure in most cases. Shouting, chasing, conspicuous deterrents, and punishment are likely to make the situation worse. Even polite asking of individuals to refrain seems to encourage further activity from some individuals. Too often parents defend their children to avoid an embarrassing admission or payment of damages. In some cases, they might be convinced of the bad effect this has on the landscape and the development of children. Of course, this approach offers no immediate protection.

Thus, direct cures for vandalism usually do not exist. This means most of us will continue to suffer vandalism on our individual sites. Yet we can help with the problem through education. It is up to us to find appropriate methods of speaking and showing pictures that teach appreciation of landscape beauty and the senselessness of vandalism.

R. E. Engel
Rutgers University
December 1972

Timely Reminders

by Dr. Henry W. Indyk

The cold drab days of the winter provide a welcome respite from the daily pressures of turf work during the growing season. The change of pace transcends the melancholy that ensues when the vast stage of nature becomes brown and barren and only to be beautified by the deepness and whiteness of snowflakes. The seemingly long winter months provide an opportunity to pause and reflect upon the accomplishments of the past year and to plan for the future season. Numerous opportunities are provided through various types of meetings and conferences such as the Annual Turfgrass Conference at Rutgers, to bolster technical knowledge, particularly to stay abreast of new developments. And, of course, needless to mention, there is no better time of the year for an escape to a warm climate or if you prefer to the ski slopes to obtain some well deserved pleasure and relaxation.

In developing a relaxing mood during the winter, one has a tendency to make it a total escape and thereby become oblivious to winter turfgrass problems. Very often the symptomatic scars that develop and become evident in spring to the least observant critics serve as a grim reminder that turfgrass areas are subjected to problems during the winter also. Winter kill of turf may be attributed to various factors, some of which are uncontrollable but others controllable. Protection of the turf against damage from such factors as dehydration due to very low temperatures combined with strong winds in the absence of a snow cover or kill due to a prolonged ice cover is very difficult or impossible. On the otherhand, other problems exist against which a conscientious turfgrass manager can effectively provide satisfactory protection.

Snow mold is a winter disease that can cause very serious turf losses. It is associated with melting snow and

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Where summers are cool, they will tolerate rather close mowing. In northern Europe the Chewings type fescues are extensively used for closely mowed turf, often in mixtures with bentgrasses. In warmer areas where red fescues are grown it is best to mow them at heights of 2 to 3 inches. The name 'Chewings Fescue' is from a Mr. Chewings who first sold its seed in New Zealand. Seed lines traced to this source have been grown in Oregon for many years and are certified under the variety name 'Chewings.' The variety 'Cascade' is equivalent to this type. This Oregon-produced seed was given a special name to qualify it for international trading purposes. A number of Chewings-type fescue varieties have been developed in recent years and some show considerable promise in tests. 'Jamestown' is a dark green variety developed by the University of Rhode Island. 'Highlight' is a light green variety developed in Holland. These two are among the best of the improved Chewings-type fescues. Most Chewings-types including Jamestown and Highlight are susceptible to powdery mildew. Their dense growth habit can make them much more competitive and persistent in mixtures with Kentucky bluegrass than fescue varieties formerly available. This can be either an advantage or a disadvantage. Persistence in mixtures might also be enhanced by decreasing the amount of fertilizer and increasing the height of cut. A Chewings-type synthetic composed of 45 locally-adapted clones (RU45C) is being tested throughout the northeast. Its performance is encouraging and it is being tested for seed production in Oregon.

THE CREEPING TYPES and spreading types of red fescue are designated by taxonomists as *Festuca rubra* L. subsp. *rubra*. The creeping types have 42 chromosomes and are represented by varieties such as 'Cumberland Marsh,' 'Dawson,' 'Golfrood' and 'Oasis.' They are fine-leafed, low-growing varieties with short thin rhizomes; and, under mowing, they develop a turf similar in appearance to the better Chewings-type fescues. Some types, such as Golfrood, have demonstrated good salt tolerance. The creeping types generally are poor seed producers. They can be seriously damaged by the dollar spot disease in some areas. Some of the most leafspot-resistant varieties are found in this group.

THE SPREADING TYPES of fine fescue have 56 chromosomes, somewhat wider leaves, long spreading rhizomes and good seedling vigor (Figures 1 and 2). They are not as tolerant to close mowing and grow less dense than the creeping or Chewings-type varieties. Under New Jersey conditions, they have performed well in our roadside tests and in mixtures with bluegrass varieties. 'Fortress' and 'Ruby' are representatives of the spreading-type fine fescues. A synthetic of six locally adapted spreading fescues is being tested at various locations under mowing and it is receiving intensive study in New Jersey for roadside use. Early performance is good and it is scheduled for trial increase in Oregon and possible release as 'Fortress.'

Fig. 1

A dark green clone of a spreading fescue stands in striking contrast to common-type Kentucky bluegrass.

Fig. 2

The seedling vigor of a spreading fescue greatly exceeds that of Chewings-type fescues. Seedling height and weight data from several experiments substantiate the above difference.

THE HARD FESCUES *Festuca longifolia* Thuil., are receiving considerable attention since the development and release of 'Biljart' hard fescue (Scotts C-26) in Holland. Because of the success of this new hard fescue variety, turfgrass breeders in both the United States and Europe are collecting hard fescue plants from old turf areas and initiating breeding programs with this species. The better hard fescues produce a turf comparable in texture and growth habit to the better varieties of the Chewings-type fescue but with a somewhat slower rate of vertical growth, better resistance to some diseases and better adaptation to some poor soil conditions. Warm season color of C-26 is an attractive deep green that persists in spite of moderate drought. Cool-season dormancy may be bothersome. The hard fescues spread only by tillering and appear to be rather slow to recover from wear and other types of injury when grown in pure stands.

THE SHEEPS FESCUE TYPES *Festuca ovina* L. are too wiry and blue colored to blend with other turfgrasses. They may be found in shaded droughty sites that have been under low maintenance.

Table 1 summarizes differences among these fine fescues.

TABLE I

CHARACTERISTICS OF FINE FESCUES

Type	Height	Spread	Leaf Texture	Chromosome Number	Typical Varieties	Color
Chewings	low	very little	fine	42	Highlight Jamestown Cascade	lgt. green dk. green med. green
Creeping	medium	little	medium	42	Dawson Golfrood	med. green lgt. green
Spreading	mod. tall	good	broader (like Common Kentucky bluegrass)	56	Fortress Ruby	dk. green dk. green
Hard	low	very little	fine	42	C-26	dk. green
Sheeps	low	very little	wiry	28	none available	blue green

*Effects of North- and South-facing Slopes on Yield of Kentucky Bluegrass (*Poa pratensis *L.) with Variable Rate and Time of Nitrogen Application. O. L. Bennet, E. L. Mathias, and P. R. Henderlong. Agron. J. 64:630-635 (1972).*

Abstract

Field studies were conducted near Morgantown, W. Va. during the 1966 to 1969 growing seasons to determine the effect of slope orientation on the yield of Kentucky bluegrass (Poa pratensis L.) treated with 0, 112, 224, 448, and 672 kg/ha rates of N (series of N applications of approximately 2 to 13 lbs/M ft^2) applied singly and in up to four split applications. Slopes were approximately 35%. Soil on both slopes was Gilpin silt loam. The rate of growth, total yield, seasonal distribution of yield, and N recovery in plants were influenced greatly by slope orientation. Production on the north-facing slope was more than twice that on the south-facing slope. Splitting the N applications tended to produce a higher yield and more uniform seasonal distribution. A combination of high soil temperatures and low soil moisture levels appeared to limit growth on the south-facing slope. Maximum soil temperature on the north-facing slopes were from 8 to 10 C (15 to 18 F) less than on the south-facing slope. Temperatures were measured 2.5 cm (1 in) below the soil surface under the bluegrass sod. Yield differences due to slope orientation completely overshadowed any yield responses from specific fertility treatments.

Comments

Nearly everyone who works with turf has heard comments on the differences in growth conditions of varying slopes. Do we actually appreciate the influence on slope exposure on our day-to-day turf maintenance? First, we have a tendency to think 8 to 10 C temperature differences have little consequence. Yet, if we stop to think of our experiences, anxiety about turf loss is of considerable concern when daily temperatures increase from 85 to 95 F and this concern multiples greatly when temperatures go above 100 F. Also, this study emphasizes the great reduction in growth with high temperatures which couples with high temperature and low moisture to kill grass on warm sites. The review of this study reminds us that we should (1) plan watering systems that can work independently on northern and southern slopes, and (2) minimize the use of tender types of turf plantings on hot southern exposures for ease of maintenance.

REE

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most commonly is found in areas where snow tends to accumulate either naturally or due to man's activities. Bentgrass and annual bluegrass are especially susceptible to a permanent type damage. Damage can occur on other turfgrasses as well but frequently the scarred turf does recover satisfactorily. The incidence of snow mold can be reduced to some extent by scattering snow that has accumulated either from drifting or shoveling. In lawns, snow mold will commonly develop along sidewalks and driveways where snow accumulates from shoveling. A high degree of assurance against snow mold damage can be provided with fungicidal treatment. Fungicides such as Daconil 2787, Dyrene, and Tersan SP are effective materials. Fungicide treatments have been used primarily on golf courses. However, lawns as well as other turfgrass areas that have had a previous history of snow mold injury would benefit from fungicidal treatment.

Another major problem is attributed to certain deicing materials that are applied to slippery walks or driveways. The movement of deicing materials to turf areas as a result of washing or shoveling can injure turf when certain concentrations are exceeded. Aside from turf injury, certain of the deicing materials can damage concrete as well. In order to avoid injury to either turf or concrete, use deicing materials sparingly. Too frequently materials are used carelessly and excessively. New materials being promoted that overcome injury problems may be worthy of trial. Another consideration is to use sand. Sand is a very effective material in providing traction underfoot without any danger of damaging turf or concrete. Tracking it into entrance ways where it can be damaging to floors because of its abrasive action is a major objection. This problem can be reduced considerably with the provision of suitable door mats. More attention in selection of material, careful and cautious treatment of ice problems on walkways and driveways will greatly reduce the necessity of repairing damage to turf as well as concrete.

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Thoughts of

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Most of us will agree that when it comes to painting our own home it pays to buy the best paint. After all, we want the paint job to look its best for as long as possible . . . say 6 to 8 years.

Isn't the underlying concept even more pertinent to establishing our lawn, or any turf we're responsible for . . . that we should buy the best grass that's available? After all, we want our lawn to look attractive and expect it to last much longer than a coat of paint!

Although written a few years ago, the following article is considered timely and informative. The Editor

Pollutants and the Roadside

by Edwin D. Carpenter
University of Connecticut at Storrs
"Horticulture" Oct. 1968

Gone are the days when chemicals were not needed on our roads in winter.

With the winter season approaching once more a symposium held at the University of Connecticut in Storrs earlier this year which explored deicing chemicals and their effects as pollutants in the roadside environment takes on added meaning. Deicing chemicals in ever-increasing quantities are spread on the nation's highways each year to remove both ice and snow. Sodium chloride and calcium chloride are recognized as the two most effective and economical deicers known. Without them, our highways and city streets would be hazardous to drive upon during the winter months.

However, the use of deicing chemicals in recent years has been increasing and all predictions indicate that the amount of these chemicals will be still greater in the years to come. Although the acceptance of sodium chloride and calcium chloride is nearly universal, there are serious questions concerning their effects upon soil, surface and ground water and vegetation to be answered.

William C. Greene, landscape architect for the Bureau of Public Roads, has indicated three major problems connected with the use of deicing compounds. First, our nation's roads must be kept free of ice and snow for safe driving. Second, highway officials must know the most effective deicers to use and the minimum rates to apply them. Third, researchers need to determine the long term effects of deicing chemicals on water supplies, soils, plants and agricultural production. It is generally agreed that much more emphasis is needed in the area of research in relation to deicing chemicals and their side effects as pollutants of water and soil.

According to William E. Dickinson, president of the Salt Institute, consumption of salt as a deicing agent was over six million tons in the United States last year. In addition, Canada used 1.2 million tons. The salt industry expects that consumption of salt for highway and street purposes to be eight million tons by 1970 and ten million tons by 1975.

Why is salt used so extensively? Mr. Dickinson states that salt is the principal tool in a very costly but essential operation. The Highway Research Board reported in 1964 that snow removal in 33 northern states cost 151 million dollars, 18 percent of all highway maintenance costs in those states. Secondly, no acceptable substitute for salt has yet been found. Mr. Dickinson also indicated that "new, dramatic, technological breakthroughs are not yet on the horizon" and that it is reasonable to assume salt will maintain its primacy in the immediate future.

In reference to salt injury to vegetation, Mr. Dickinson stated that some injury must be expected. Several studies have indicated that trees planted as close as 8 feet, or closer, to the pavement revealed salt damage. Of course, under these circumstances such damage is not surprising. Mr. Dickinson further stated that if all "non-essential obstacles"—such as trees—are cleared from the roadside for at least 20 feet, and preferably farther, much of the salt damage to vegetation would be solved.

Mr. Dickinson concluded that "sodium chloride and/or calcium chloride have yielded generally excellent results in clearing snow-covered or icy pavements at minimum costs. The savings in accident damage, personal injury and human lives dwarf any real or suspected brine damage to vegetation, water supplies or wildlife no matter by what standards they are measured."

Dr. F. E. Hutchinson, University of Maine, indicated that sodium and chloride levels along Maine's highways where salt has been supplied have considerably increased over levels found in unaffected soils. Salt levels tend to have greater influence near the road embankment edges and decrease with distance from the highway. Dr. Hutchinson also said that levels increase with the length of time that deicing chemicals are used and that levels increase over greater distances with time.

Further, research conducted by Dr. Hutchinson showed that sodium has an adverse effect upon a soil's physical properties by dispersing the colloidal particles. Hence, alkali soils lack aggregation and are poorly-drained, structureless soils. From Dr. Hutchinson's work, it appears that sodium levels, at least at some sites, from salt applications results in poorer drainage of soils along highways which could present a new problem. Furthermore, sodium and calcium levels present in these soils are rapidly approaching a point where they may be toxic to some desirable vegetation species growing in the area.

In discussing the movement of dissolved salts in ground water systems, Dr. P. H. Rahn, University of Connecticut, indicated salts "move easily with ground water and must be treated with respect." Salt water intrusion into some coastal ground water systems bears testimony to this fact. Dr. Rahn further said that uncovered highway stockpiles present a source of pollution to ground waters, particularly in the "right hydrogeologic environment." Although industrial and municipal wastes have polluted wells along rivers by intrusion, it seems doubtful that, at present, salt applied directly to highways poses any threat as a ground water pollutant.

Dr. Rahn cited his research involving the University of Connecticut's well field. This well field is located along a river from which approximately one-third of the well water is derived. In 1967 Dr. Rahn dumped 17 tons of rock salt into the river, raising the natural conductivity about 10 times. None of this salt was found in the wells. Evidently the downward infiltration of the river water through the stream bed is very slow and the mixing with other ground waters reduced the salt content, so that it could not be detected in the wells.

Dr. Avery E. Rich, University of New Hampshire, stated that he has found sugar maples planted within 30 feet of the highway are usually damaged by salt. On the other hand, trees more than 30 feet away from the highway are almost always healthy. Dr. Rich indicated that injury symptoms "include marginal leaf scorch, early autumn coloration and defoliation, reduced shoot growth, dying of twigs and branches and ultimate death of severely affected trees." However, salt injury was not correlated with the size and age of the trees, soil types, fertility or parasites.

Another study conducted by the University of New Hampshire showed that trees adjacent to salted state roads exhibited considerable salt injury. Trees along unsalted town roads showed almost no injury, stated Dr. Rich.

Greenhouse studies conducted by Dr. Rich and co-workers showed that eastern white pine, Canadian hemlock, balsam fir and, to a lesser extent, red pine are also injured by salt. Repeated applications of sodium chloride to eastern white pines were found to be very injurious whether made to the foliage or to the soil. This evidence suggests that either salt spray or runoff, or a combination of them, can injure roadside trees under ordinary conditions.

Dr. Rich stated that Norway maples and oak species are more tolerant of salt injury than those mentioned above.

Speaking about salt effects on grassy vegetation in Iowa, Dr. Eliot C. Roberts, University of Florida, indicated that high levels of sodium and calcium salts have inhibited grass seed germination, seedling growth and have injured established turf. Dr. Roberts stated that the amount of organic matter present in the soil had a direct bearing upon grass salt tolerance. In general, the greater the organic matter content of the soil, the greater the concentration of sodium chloride vegetation will tolerate before showing injury.

Results obtained by Dr. Roberts indicate "that seven coarse-textured grasses have potential use in soils of a non-saline alkali nature." These grasses are Kentucky 31 fescue, tall grass, western wheatgrass, slender wheatgrass, intermediate wheatgrass, Russian wildrye and reed canarygrass. In greenhouse studies, sand lovegrass and blue grama showed good salt tolerance but germination was not uniform.

Tolerance of plants to roadside salt varies considerably, Lucian Zelazny, Virginia Polytechnic Institute stated. Grasses like alkali sacaton, saltgrass, nuttall alkaligrass, Bermuda grass and Rhodes grass are tolerant of salt condition. Black locust and honeylocust are the most salt tolerant trees followed by ponderosa pine, golden willow and green ash among those observed. Such plants as honeysuckle and eastern redcedar have also been shown to be salt tolerant.

Research conducted by Mr. Zelazny has shown honeylocust to be the most salt tolerant, followed by the white birch. He also indicated that redbud is intermediate in salt tolerance. Mr. Zelazny found privet the most salt tolerant shrub, followed by honeysuckle. Forsythia was found to be of intermediate tolerance, and weigela and spiraea the least tolerant of those tested.