

NETTING, TALL FESCUE TEAM UP TO PRODUCE NINE-MONTH SOD

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Tall fescue (*Festuca arundinacea* Schreb.) is widely utilized in the transition region of the United States for lawns, parks, general grounds, and high school athletic fields. Compared to Kentucky bluegrass, tall fescue exhibits greater drought and high temperature tolerances. Wider use of tall fescue would be anticipated if it had greater shoot density, a narrower leaf texture, and could tolerate a lower mowing height. Cultivars are now being developed and released which are reported to be improved in these characteristics compared to Kentucky 31, which is the most commonly used cultivar.

Establishment of tall fescue has been almost entirely by seeding. Sodding would be an attractive alternative. However, tall fescue does not produce the long, interwoven rhizomes which provide sod strength necessary for harvesting and handling. Consequently few sod producers have attempted to grow tall fescue for sod.

Alternative Approaches

Some growers have seeded Kentucky Blue-



Harvestable in nine months, the fescue and netting combination exhibited tensile strength five to six times greater than tall fescue sod without netting.

grass with tall fescue, usually at a 75-90% tall fescue to 10-25% Kentucky bluegrass mixture on a seed weight basis. The Kentucky bluegrass is expected to provide sod strength through rhizome development. Several problems may occur with this approach. Production time to develop a sod with good handling properties is often more than 18 months even under ideal conditions, resulting in high production costs. Another problem observed is that Kentucky bluegrass often tends to become the dominate species. When this happens, the tall fescue starts to take on a bunchy appearance since individual clumps develop. If this occurs before harvesting, the sod quality is inferior and not as marketable. However, even if the clumping is not apparent at time of harvesting it often appears within a year of transplanting.

An alternative approach to sod production is the use of netting to provide sod strength. Beard¹ demonstrated the usefulness of netting for Kentucky bluegrass and this technique is now widely accepted. With Kentucky bluegrass, production time is greatly reduced since harvesting can be done as soon as shoot quality is adequate.

Recently, Burns² and Carrow and Sills³ demonstrated that tall fescue sod production by this technique is feasible. Carrow and Sills³ used VEXAR Garden Utility Net (E.I. duPont de Nemours and Co.) with a 2 x 2 cm mesh laid on the soil surface. Tall fescue was seeded at 4 lbs. seed per 1000 sq. ft. in both fall (Table 1) and spring (Table 2) seeded studies. The fall seeded tall fescue exhibited sufficient quality to harvest by 9 months (May), while the spring seeded area was ready for cutting in 4.5 months (August). In both studies, visual quality was somewhat better for plots containing netting. This response may have been due to seed washing during heavy rains which occurred in the no-net plots.

Sod tensile strength was 5 to 6 times greater for the fescue sod containing netting. Without netting, tall fescue sod was difficult to handle; with netting, its handling properties were excellent.

Transplant sod quality data refers to the visual quality of the turf at one month after transplanting. Netted plots exhibited somewhat better quality, probably due to a better quality at the time of harvesting. Transplant sod rooting indicates the ability of tall fescue to reroot after harvesting and transplanting. No differences were observed between netted and no-net plots which would indicate that the netting does not interfere with rooting after transplanting.

In a third investigation, seeding rate, nitrogen rate, and time of nitrogen application were stud-

ied (Table 3). The 8 lb. seed per 1000 sq. ft. rate resulted in better quality turf due to higher shoot density and uniformity. Also, sod tensile strength was improved. However, quality and sod tensile strengths were acceptable at the 4 lb. seeding level.

By May 1, individual plants were noted to be smaller and less vigorous at the 8 lb. seeding rate. Increased competition between plants may account for the higher incidence of *Helminthosporium* leaf spot. At the 8 lb. seeding rate, the

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Table 1. Fall seeded (Aug. 30, 1977) netting study on tall fescue.

Netting treatment	Quality rating ^z				Sod tensile strength ^y (lb)	Transplant sod quality rating ^z	Transplant sod rooting ^x (lb)
	7	10	37	41			
Net	6.8	6.8	7.3	7.8	68	5.7	119
No Net	6.3	6.2	6.4	7.5	13	5.0	107
LSD (5%) =	0.4	0.4	0.4	0.3	6	0.6	NS

^zVisual quality rating: 9 = ideal, 1 = no live turf.

^yForce necessary to break a 12 inch wide strip of sod.

^xForce necessary to separate an 11 x 11 inch sod piece from the soil by vertical lifting.

Table 2. Spring seeded (March 29, 1978) netting study on tall fescue.

Netting treatment	Quality rating ^z			Sod tensile strength ^y (lb)	Transplant sod rooting ^x (lb)
	10	13	19		
Net	7.0	7.2	7.4	67	95
No Net	6.5	6.5	6.9	11	90
LSD (5%) =	0.5	0.5	NS	3	NS

^zVisual quality rating: 9 = ideal, 1 = no live turf.

^yForce necessary to break a 12 inch wide strip of sod.

^xForce necessary to separate an 11 x 11 inch sod piece from the soil by vertical lifting.

Table 3. Effects of seeding rate, nitrogen rate, and nitrogen application date on fall seeded (Aug. 29, 1978) tall fescue using netting.

Treatment	Quality rating ^y , 1979				Leaf ^x spot rating May 9	Turf cover (%)	Sod tensile strength (lb)
	Apr 4	May 1	June 7	July 3			
Seeding rate (lb/1000 ft ²)							
4	5.0	5.7	6.7	7.4	1.6	87	91
8	6.6	6.1	7.1	7.6	2.2	93	106
N rate (lb/100 ft ²)							
1.5	5.8	5.8	6.6	7.4	2.0	88	97
3.0	5.8	6.0	7.2	7.6	1.9	91	101
Application date ^z							
Sept, Oct	5.4	5.5	6.7	7.3	1.8	88	94
Sept, Nov	6.0	6.0	6.7	7.5	2.4	88	104
Sept, Mar	6.5	5.7	6.7	7.5	2.0	88	91
Sept, Apr	6.5	6.3	7.5	7.6	1.5	95	106
LSD (5%) (seed rate) =	0.9	0.8	NS	NS	0.5	5.6	4
(N — rate) =	NS	NS	NS	NS	NS	NS	NS
(App. time) =	NS	0.6	NS	NS	NS	NS	NS

^zNitrogen application was split equally between dates.

^yVisual quality rating: 9 = ideal, 1 = no live turf.

^x*Helminthosporium* spp. leaf spot scale: 0 = none, 2 = moderate, 5 = severe, with 75% or more leaves with lesions.

^wSod tensile strength taken on July 11. Force necessary to separate a 28 x 28 cm sod piece from the soil by vertical lifting.

turf was very dense and tended to lift the netting from the soil. These factors would suggest that a seeding rate of about 6 lb. seed per 1000 sq. ft. and a coarser mesh netting may be beneficial for tall fescue sod production.

Nitrogen rate did not significantly influence any of the factors measured. The application program of September-April tended to exhibit the best visual quality. This would suggest that for a fall seeded tall fescue, nitrogen in the spring should be considered, especially if the sod is to be harvested in late spring.

Possible Production Problems

Since most sod producers are not familiar with tall fescue sod production, they should consider the possible problems that may occur. In the previous section we alluded to potential problems; (a) high seeding rates may result in excessive competition, (b) a dense stand may lift the netting if it is not buried or is too fine of mesh.

Equipment is commercially available to bury netting during the seeding operation. Burying should be considered, particularly in windy sites which are common in the Central Plains. High winds may lift the netting if it is not covered with $\frac{1}{8}$ - $\frac{1}{2}$ inch soil. The equipment should be tried out on each particular site, especially if the soil is high in clay and tends to develop clumps. Burying the netting can be difficult with such soil conditions.

Whenever netting is buried, the grower faces a problem if the crop fails. Removal of the netting is very difficult prior to working the soil for reestablishment. Disking several directions followed by deep plowing will often place it deep enough for reestablishment. However, deep cultivation should be avoided in the future.

Another factor which should be considered is the cutting depth for tall fescue sod. The crown of tall fescue is quite large compared to Kentucky bluegrass. Sod cutting depth must be below the lower crown region since cutting the crown will prevent root establishment. Also, cutting depth must be sufficient to be below the netting. In general, tall fescue will require a somewhat deeper cutting depth compared to Kentucky bluegrass.

Tall fescue is not as low temperature tolerant as Kentucky bluegrass and hence a greater possibility of low temperature kill exists. Normally, a tall fescue, which has sufficient time to become winter hardy will not be injured. Sod growers should avoid late fall seedings, excessive nitrogen fertilization, and over-irrigation on fall seeded stands.

In the Central Plains region, *Helminthosporium* leaf spot injury has periodically been observed on tall fescue. This is normally not a problem on mature plants but may occur in the late fall and spring periods and newly seeded sites.

Avoiding high seeding rates and excessive nitrogen will minimize this problem.

Growers must adjust their mowing program to tall fescue. The late spring period is especially important. During this time, tall fescue produces a seed head which grows very rapidly. Care must be taken to maintain an adequate mowing frequency. Research is presently underway at Kansas State University to explore the possibility for utilizing growth regulators on tall fescue during the spring period to reduce seed head production and mowing frequency.

Beard¹ noted that weed control is very important when using netting. Since sod production time is greatly reduced with netting, weeds must be eliminated or prevented by the proper use of herbicides. Preemergence annual grass control and broadleaf weed suppression in the young tall

Slower sod transplant rate is likely with tall fescue.

fescue stands would be of primary concern. If weeds are allowed to develop, the sod must be held longer in order for the openings to fill in. This is especially important on a bunch-type turf, such as tall fescue, since it does not have rhizomes or stolons to quickly fill in open spots.

When transplanting a tall fescue sod, care should be taken to insure good transplant rooting. Since tall fescue does not have long rhizomes, root growth must be primarily from root initiation at the crown. This fact, in conjunction with a deeper cut sod, can result in a slower sod transplant establishment rate compared to Kentucky bluegrass.

While there are several potential production problems, these can be overcome with proper management. With the introduction of improved tall fescue cultivars, the potential for much greater utilization is present. Growers may wish to explore this market.

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