POA SUPINA ON BOTH SIDES OF THE POND: THE EUROPEAN PERSPECTIVE

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INTRODUCTION

Supina bluegrass (*Poa supina* Schrad.) is a turf species native to the European Alps and other mountaineous regions in Central Europe. Interest in *Poa supina* began in Germany twenty years ago, when it was observed to invade and readily establish itself in high altitude alpine golf courses and athletic fields in Austria and Germany. The turf species has been gaining popularity on golf courses and athletic fields in alpine countries ever since. Some of the characteristics that make *Poa supina* a highly suitable turf species are stoloniferous spread, short internodes, resistance to disease, and good wear and shade tolerance (Berner 1980, Leinauer *et al.* 1997).

ORIGINS AND HISTORY

Poa supina was first observed on pastures, cow paths and around stalls in alpine regions of Central Europe (Klapp and Opitz von Boberfeld 1990). This indicated a species that could thrive in compacted soils that received high amounts of nutrients and precipitation. The common names given to *Poa supina* in Germany are "Niederliegende Rispe" (low lying bluegrass) (Oberdorfer 1962, cited in Skirde 1971), which refers to its stoloniferous growth, and "Lägerrispe" (bluegrass where cows lay) (Klapp and Opitz von Boberfeld 1990). Annual Bluegrass *(Poa annua)* was once thought to descend from *Poa supina* and *Poa infirma* (Nannfeld 1937, Tutin 1952, 1954, cited in Pietsch 1989), a bluegrass found in warmer, sun exposed areas of Europe. However, more recent research concluded that *Poa annua* (2n=28) is an amphidiploid offspring of *Poa supina* (2n=14) and *Poa trivialis* (2n=14) (Pietsch 1989).

Breeding programs were started with *Poa supina* in the late 1960's in Steinach, Bavaria. E. Frank collected samples of the first ecotype that was used to breed 'Supra' , the first commercially available cultivar of *Poa supina,* on a soccer field in Straubing, Bavaria (Pietsch 1989). More recently, an improved cultivar called 'Supranova' was released and is now available in the United States. A new cultivar called 'Suprafax' will be released within the next two years (Berner, pers. comm.).

TURF CHARACTERISTICS

Morphology

Poa supina is characterized by a stoloniferous growth habit, which allows it to recuperate quickly from damage and rapidly colonize bare spots. This feature makes *Poa supina* highly competitive with other turf species. In addition to its stolons, it can be distinguished from other bluegrasses by its reddish-purple seed head, its relatively short internodes and the length and shape of its ligule. Compared to other turf species, its Spring green-up occurs much earlier, but its light green color is considered to be a disadvantage among turf users. Currently, breeding programs are underway to develop darker colored cultivars. However these ecotypes are poor seed producers, which limits their marketability (Berner, pers. comm.).

Wear tolerance

Poa supina has demonstrated superior tolerance to high traffic conditions compared to other turf species. In a study conducted by Nonn in South-West Germany, four soccer fields and two ski slopes were seeded with mixtures containing 5% *Poa supina* on the soccer fields and 15% and 50% *P. supina* on the two ski slopes. After 5 years of use, percent coverage by *P. supina* reached 85% on the ski slopes (Nonn 1997) and 30 to 50% on the soccer fields (unpublished data).

Water use and drought tolerance

Studies conducted at Hohenheim University found that despite its natural occurrence in areas of high precipitation, evapotranspiration rates of *Poa supina* were similar to those of other turfgrasses. Under 'compaction' conditions, evapotranspiration rates ranged from 3.1 mm day^{-1} to 5.8 mm day^{-1}, and almost never differed significantly from those of the other tested species (Leinauer *et al.* 1997). Drought tolerance was assessed by determining Crop Water Stress Indices (CWSI), quality rankings and rooting patterns during prolonged periods of drought stress. After the drought periods, CWSI's for *Poa supina* were significantly higher than those of Creeping Bentgrass and Red fescue (Leinauer 1997). Quality rankings confirmed that *P. supina* was less tolerant to drought stress than the other two species. Root mass of *P. supina* was significantly lower in 20-30 cm soil depths than for the other two species (Leinauer 1997). The relatively shallow rooting system of *P. supina* results in less efficient drought avoidance and explains its poor drought tolerance. Based on these results, *Poa supina* appears to have similar water needs to other turf species under realistic, high traffic conditions. However its poor drought tolerance suggests that it may need more frequent irrigation (Leinauer 1997).

Shade tolerance

In a study conducted at Hohenheim University in 1994, *Poa supina* showed superior shade tolerance compared to six other turfgrass species. The effect of shade on newly seeded Supina bluegrass (*Poa supina* cultivar 'Supra') and on other grasses including perennial ryegrass (*Lolium perenne* cultivar 'Elka'), Kentucky bluegrass (*Poa pratensis* cultivar 'Nutop'), chewing's fescue (*Festuca rubra commutata* cultivar 'Banner'), red fescue (*Festuca rubra rubra* cultivar 'Monica'), and creeping bentgrass (*Agrostis stolonifera* cultivar 'Penncross') was examined and evaluated in a open greenhouse pot experiment. The pots were seeded on April 19th, 1994 and two types of polyethylene nets, suspended 30 cm above the pots, provided shade. One type reduced light intensity by 55%, the other by 75%. Controls consisted of plants exposed to 100% light (no shade). Ground coverage, quality, and color were assessed in June and August. Under 50% and 75% light reduction conditions, ground coverage was consistently higher for *P. supina* than for all the other species examined. Quality ranking was also highest for *P. supina* under control and shade conditions. These results indicate that *P. supina* is well suited for shady locations, such as permanently covered sports stadiums. Nonn (1994) also observed that overseeded *P. supina* outcompeted other turfgrasses in shady greens and tees on golf courses in Southern Germany. Colour ranking was always lowest for *P. supina*, largely because of its naturally light green colour.

In conclusion, studies demonstrated that *P. supina* is well suited for shady and/or high trafficked locations. It produces a dense, high quality turf, even under very low cut conditions. Water requirements, as indicated by evapotranspiration rates, were not found to be significantly higher than of other turfgrasses. However, it showed a low tolerance to drought stress due to its shallow rooting system.

REFERENCES

Berner, P., 1980. Characteristics, Breeding Methods, and Seed Production of *Poa supina* Schrad. In 'Proceedings of the Third International Turfgrass Research Conference' (Ed. J.B. Beard) pp. 409-412. (The American Society of Agronomy Inc., Madison, Wisconsin, USA).

Klapp, E. und W. Opitz von Boberfeld, 1990. Taschenbuch der Gräser. 12. Auflage, Verlag Paul Parey, 282 p.

Leinauer, B. 1997: Einfluß der Bewässerungsart auf Wasserverbrauch, Trockenstreß- und Regenerationsverhalten einiger Rasengrasarten. Diss. Universität Hohenheim.

Leinauer, B., H. Schulz, D. Bär and A. Huber, 1997. Poa Supina Schrad.: A New Species for Turf. International Turfgrass Society Research Journal, **Volume 8**, 345-351.

Nonn, H., 1997. Hochlagenbegrünungen mit *Poa supina* in Mischungen. Proceedings XXVII. Internationales Rasenkolloquium 1997 (27ème Colloque Internationale Gazon 1997) vom 24. bis 27. September 1997 in Aix les Bains (Frankreich/France).

Nonn, H. 1994. Erkenntnisse aus der Praxis mit Saatgutmischungen und Soden mit Lägerrispe (*Poa supina* Schrad.) auf Golfplätzen. *Rasen Turf Gazon* **4/1994**, 101-104.

Pietsch, R. 1989. *Poa supina* (Schrad.) und seine Bedeutung für Sport- und Gebrauchsrasen. *Zeitschrift für Vegetationstechnik* **12**, 21-24.

Skirde, W. 1971. Beobachtungen an *Poa supina* Schrad. *Rasen Turf Gazon* **2/71**, 58-62.