by Dr. James B. Beard

TURFGRASS RESEARCH REVIEW

Identifying *Agrostis* cultivars

Seedling difference among Agrostis species and varieties. *L.W. Nittler and T.J. Kenny. 1969. Crop Science. 9(5):627-628. (from the Department of Seed Investigations, New York State Agricultural Experiment Station, Geneva, N.Y. 14456).*

The objective of this study was to develop methods for distinguishing species and cultivars of *Agrostis* while in the seedling stage. The studies were conducted in controlled climate growth chambers with continuous light with a complete nutrient solution supplied. The experiments were terminated five weeks after the grass seeds were planted. The data collected included growth habit, leaf sheath color, stem diameter, leaf blade length, leaf blade width, stem length and stem number. Cultivars evaluated in the study were common redtop (*Agrostis alba* L.), 'Kingston' velvet bentgrass (*Agrostis canina* L.), 'Penncross' and 'Seaside' creeping bentgrasses (*Agrostis palustris* Huds.) and 'Exeter' and 'Highland' colonial bentgrasses (*Agrostis tenuis* Sibth.)

Differences among species were evident within three weeks following planting. Creeping bentgrass plants were characterized by long stems, an intermediate leaf size and a prostrate or decumbent growth habit. Velvet bentgrass plants had small leaves, many stems, a small stem diameter and a prostrate or decumbent growth habit. Colonial bentgrass plants were short, intermediate in leaf size and upright in growth habit. Redtop plants were characterized by a large leaf size, relatively few stems, a large stem diameter and an upright growth habit.

A comparison between the two colonial bentgrass cultivars, Exeter and Highland, showed Exeter to have twice as many leaf sheaths with a red coloration as was observed with Highland. The Highland cultivar had a greater number of stems per plant, a greater stem length and a significantly higher percentage of decumbent plants. In contrast to the differences observed between the two colonial bentgrass cultivars, no significant differences were observed between seedlings of the two creeping bentgrasses.

Seed analysts can identify most *Agrostis* turfgrass seed as to species but distinguishing cultivars is much more difficult. The authors have concluded from this study that *Agrostis* species and certain cultivars can be distinguished in the seedling stage. Thus, such a technique could be used to determine if seed of certain species is correctly labeled as to the specific cultivar.

Response of "Tifgreen" bermudagrass and "Windsor" Kentucky bluegrass to various light spectra modifications. *G.R. McVey and E.W. Mayer. 1969. Agronomy Journal 61(5): 655-659. (from O.M. Scott and Sons, Marysville, Ohio 43040).*

The objective of this study was to determine the optimum light intensity for turfgrass growth and development as affected by two types of light quality: (a) blue, with sunlight transmission primarily in the 410 to 510 millimicron range and (b) gray, with sunlight transmission from 390 to 760 millimicrons. Mature sods of Tifgreen bermudagrass and Windsor Kentucky bluegrass were utilized in this study. The cultural practices included a weekly clipping at 1.5 inches, watering three times per week and a monthly application of one pound of actual nitrogen per 1,000 square feet. The sod pieces were placed under transparent, acrylic plastic panels having varying light transmission properties in the blue and gray light transmission ranges. The light intensities used in the study ranged from 18 to 74 per cent of full sunlight for the blue transmitted light treatment and from 15 to 71 per cent for the gray trans-

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mitted light. Data taken included fresh weight of clippings removed and plant height, plus visual ratings of turfgrass quality, color, shoot density, seedhead formation and mildew incidence.

Comparisons of turfs grown under blue light versus gray light showed better turfgrass color and quality when grown under the blue light whereas fresh weight clipping removal and plant height were less. These differences were most evident at light intensities ranging from 25 to 45 per cent of full sunlight. In the case of bermudagrass, seedhead formation was reduced when grown under gray transmitted light compared to turfs grown in full sunlight. In contrast, seedhead formation was stimulated when grown under blue light as transmission values of more than 40 per cent of full sunlight.

Comparisons of light intensity affects showed that turfgrass shoot density was not influenced by the two types of light quality except at low light intensities. The minimum light intensity for acceptable growth and turfgrass quality of the two turfgrass species was 40 to 50 per cent transmittance of full sunlight when grown in blue transmitted sunlight and 60 to 70 per cent transmittance when grown in gray transmitted sunlight.

In summary, these data show that over-all turfgrass quality and performance are better when turfgrasses are grown in blue transmitted sunlight rather than in gray light, and that turfgrasses can tolerate a lower light intensity when grown in the blue transmitted light.

Comments: Light is one of the essential environmental factors required for the growth and development of turfgrasses. Light can be measured in terms of (a) intensity or quantity, (b) quality and (c) duration or day length. Both turfgrass quantity and quality are significantly altered under shaded environments. The decrease in light intensity under shaded environments results in a reduction in radiation energy available for the photosynthetic process. Due to a lack of carbohydrate synthesis, there is a general decline in turfgrass quality including a reduction in shoot density, rooting depth and rate of shoot growth. Associated with this is increased succulence, thinner cell

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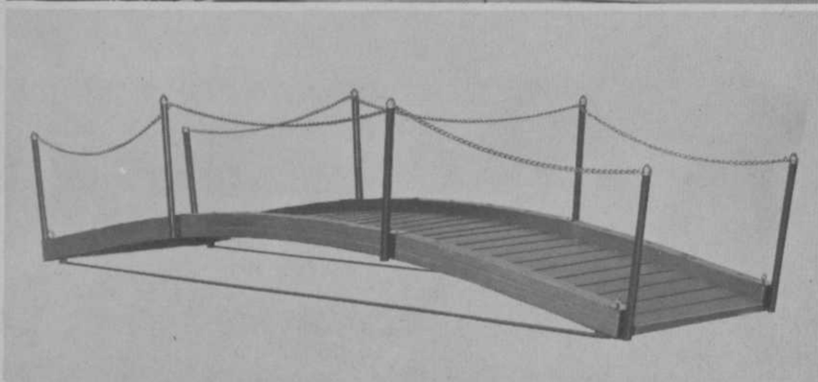


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walls and a more delicate cell structure which is quite prone to disease invasion, traffic damage and heat, cold or drought injury. The above study shows that the minimum light intensity for adequate turfgrass quality and growth will vary depending on the quality of light transmitted and turfgrass species involved.

The quality of light under a tree canopy is substantially altered. There is a general reduction in the blue and red wave lengths of the visible light spectrum and an increase in the percentage of green and far-red wave lengths. It is primarily the blue and red wave lengths which are absorbed by chlorophyll and utilized in the photosynthetic process. The importance of blue light is very well illustrated in this study. It is also the blue and red wave lengths which are "screened-out" by the tree foliage. This results in a predominance of green and far-red wave lengths under the tree canopy. Thus, the light quality under a tree canopy is reduced in those wave lengths which are most important for turfgrass growth. □

Other papers of interest:

1. Effect of temperature, light and nitrogen on growth and metabolism of "Tifgreen" bermudagrass. R.E. Schmidt and R.E. Blaser. 1969. Crop Science. 9:5-9. (from the Department of Agronomy, Virginia Polytechnic Institute, Blacksburg, Va. 24061).

2. Moisture equilibrium values for several grass and legume seeds. J.F. Harrington. 1968. Agronomy Journal. 60:594 597. (from the Department of Vegetable Crops, University of California at Davis, Davis, Calif. 95616).

3. Measuring the color of growing turf with a reflectance spectrophotometer. G.S. Birth and G.R. McVey. (from O.M. Scott and Sons, Marysville, Ohio 43040).

4. Controlled release nitrogen fertilization of turfgrass. C.R. Skogley and J.W. King. 1968. (from the Department of Agronomy and Mechanized Agriculture, University of Rhode Island, Kingston, R.I. 02881).

5. Effect of several fertilizer treatments on the production of American beachgrass culms. M.T. Augustine and W.C. Sharp. 1969. Agronomy Journal. 61:43-45. (from the Soil Conservation Service, USDA, College Park, Md.).