Performance of Bluegrass *Varieties Clipped at Two Heights*

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Can the newer varieties be used on golf course tees where mowing heights are ½ inch or even less? Can they be used on fairways where the golfer insists on close mowing? Do the dwarf varieties perform in a superior fashion to erect-growing bluegrasses now under intensive management treatments?

WITH the availability of several so-called "dwarf" bluegrass varieties has come an interest in their use for specialized turf.

Bluegrass varieties generally are well adapted for use on many soil types in the inland empire area of the Pacific Northwest. These varieties are used widely in parks, cemeteries, lawns, and on golf course fairways. Also Kentucky bluegrasses are used throughout the northern one-third of the United States. This widespread adaptation has prompted a more intensive study of the response of these grasses to intensive management practices.

Grass Response to Clipping Tested

To test the response of bluegrass varieties to clipping, turf research tests were plotted. Seven varieties were seeded in turf trials in the spring of 1962. They were clipped to 1 inch during the establishment year and fertlized with 4 lbs. of actual nitrogen per 1,000 sq. ft. High phosphorus and potassium levels were maintained based on soil tests. Plots were irrigated as needed to keep the soil moisture above the wilting point.

In 1963, 1964, and 1965, the plots were split, one half being mowed to 1 inch, the other half to ½ inch. They were mowed twice weekly during the growing season which extended from mid-April to October 1 of each year. During the three treatment years, all plots received the equivalent of 10 lbs. of available nitrogen in ammonium sulphate form.

Root Production Sampled from Plugs

In June and September 1965, the plots were sampled with a core sampler that cut a plug 4 inches in diameter and 6 inches deep. These plugs were carefully washed out and root production was recorded (Table 1). Additional data obtained in both the fall and spring of each year included color and density ratings. We can consider the numbered varieties, 602, 402, and 205 in Table 1, as "Cougar," a recent variety released from the Washington Agricultural Experiment Station.

The erect-growing variety, Delta, shows the lowest production of roots at the 1-inch height compared to all other varieties cut to the same height. Dwarf types, 0217, 602, 402, 205, and Merion produced more roots at the 1-inch height both in June and September.

Considering the ½-inch height, Delta, a tall-growing bluegrass, produced fewer roots than any of the other varieties. Tall-growing bluegrasses such as Delta, Park, Troy, and most of the common bluegrasses on today's market typically respond this way to close mowing.

As with the 1-inch clippings, plots cut ½ inch high produced more roots by September than they had in June with the exception of 0217. With this variety, production was essentially the same for both June and September.

Variety 0217, an experimental line developed by the Jacklin Seed Co., shows one other characteristic different from the other dwarf bluegrasses in this test. It took almost twice as much

Table 1. Average root production in grams under bluegrass varieties cut at two heights and harvested at two dates in 1965.

Variety	One Inch		One-Half Inch	
	June g.	Sept. g.	June g.	Sept. g.
0217	17.2	19.8	14.9	14.1
602	11.5	14.0	10.1	18.7
205	17.5	20.0	14.4	15.9
402	16.0	24.6	9.7	19.8
Merion	12.2	20.3	10.3	14.4
Newport	10.7	17.4	9.6	16.9
Delta	11.0	12.9	7.1	10.5
Cougar[1]	14.9	20.6	5.8	9.2
Nebr. blend[1]	4.2	19.7	7.4	9.6

1. These varieties in the second cutting year; all others in third cutting year.

time to wash soil from the root plugs of 0217 as it did from other dwarf bluegrasses. This longer washing time is apparently related to the greater amount of fibrous roots and, conversely, a lower amount of rhizomes in the upper 6-inch profile of the 0217 plugs. Density readings at the turf surface indicate that there was approximately 50% reduction in density of Delta compared to the low-growing bluegrass cut at the ½-inch height.

Tall Delta Can't Take Close Clip

Root yield, percent rhizomes, and surface density of bluegrass varieties grown in trials at Pullman, Wash., are shown in Table 2. These plots were clipped at ½- and 1-inch heights and were irrigated to prevent wilting. Root data from these plots were taken in the fall of the second clipping year. Here again, Delta, the tall-growing variety, produced much less root growth under both the 1-inch and ½-inch cut. Also, surface density of Delta is significantly less than that of dwarf varieties, indicating that this variety can not tolerate close clipping for any extended period. In addition, the percent rhizomes, as determined by Dr. R. L. Goss, shows a highly significant difference between the 3 dwarf varieties, Newport, Cougar, and Merion, compared with the tall-growing variety, Delta. Similar data have been reported by other workers with many plants. In every case, dwarf plants consistently withstand closer defoliation than erect-growing plants.

Data obtained from this study and those of Dr. Goss are in agreement. They show that many of the failures of bluegrass plantings on such specialized

Table 2. Root yield, percent rhizomes, and surface density of bluegrass varieties grown in 1957 and 1958[1]

Variety	Yield in Grams 1" cut	½" cut	% Rhizomes	Surface Density
Newport	5.5	4.1	47	100
Cougar	4.8	3.8	48	100
Merion	3.4	3.1	40	92
Delta	2.4	2.2	12	65

1. Data adapted from Ph.D. thesis by Dr. R. L Goss, 1960

sites as golf course tees can be attributed to the use of tall-growing varieties rather than the modern, dwarf types currently available.

Data reported for Cougar and "Nebraska blend" in Table 1 are from plots seeded in the fall of 1963. These plots were cut to ½- and 1-inch heights in the spring of 1964 and during 1965. Note particularly the root production of these two varieties; they were not allowed to become well established before cut to the ½-inch height. Bluegrass must be well established before clipping back to ½-inch. At the 1-inch height, Cougar root production was comparable to that of the varieties in the older trial.

Research Seeks Growth Habit Difference

Seedling characteristics of 4 bluegrass varieties are shown in Table 3. In the laboratory we attempted to identify some structural characteristic that could be measured to define the difference in their growth habits. Number of tillers and leaf sheath length have been proposed as possible distinguishing factors. We have not yet arrived at a satisfactory standard in our trials for measuring leaf sheaths (Table 3). Cougar and 0217 in seed production plots have the shortest mature plant stature. Thus, they are considered the most nearly true dwarfs of the varieties in this study. Yet, Delta and Nebraska dwarf have the shortest leaf sheaths. On the other hand, Cougar and 0217 show the greatest number of tillers which is one measure of grass ability to heal after mechanical injury. More refined tests are to be conducted in 1966 greenhouse trials to search for a characteristic that will distinguish bluegrass variety growth habits.

Table 3. Seedling characteristics of four bluegrass varieties in 1965.

	Average Number[1] Tillers	Average Leaf[1] Sheath Length (mm)
Cougar	2.0	7.1
0217	2.3	8.0
Delta	0.9	7.0
Nebr. Dwarf	1.7	6.5

1. 9 weeks after planting.

How to Diagnose Tree Diseases

(from page 17)

trees examined by the authors have been caused by injuries to roots or diseases of root systems.

The sudden death of a tree usually results from the destruction of nearly all the roots or from the death of the tissues at the trunk base near the soil line. Factors most commonly involved are infection by disease organisms (Fig. 9), winter injury, rodent damage, heavy concentrations of natural gas, lightning, and various types of toxic chemicals. Trees that progressively weaken over a period of years may be affected by girdled roots, decay following nearby pavement work, poor soil or drainage, lack of food, grade changes, natural gas leaks, and excessive planting depths. Any of these factors and several more may contribute to the ultimate death of the tree. Diagnosticians must be ever alert for the symptoms above ground as well as for those not so obvious below the soil.

Apply Fungicide Now To Check Snow Mold

Lawn care specialists who applied fungicide to customers' lawns last November or December for snow mold control should plan to make another application this spring.

But even if lawns were not treated last fall, applying a fungicide now will help control the disease.

This advice comes from Dr. R. E. Partyka, Ohio State University Extension plant pathologist, who says fungicides containing mercury provide satisfactory chemical control of snow mold. He suggests fungicides with organic mercury such as phenyl mercury acetate, or inorganic mercury as mixtures of mercurous chloride and mercuric chloride. Also effective are Tersan OM, Thimer, Dyrene, and Ortho Lawn plus Turf Fungicide, Partyka says.

Mercury compounds can cause plant damage if applied in heavy doses, the specialist warned. He advises that special attention be given to manufacturer's recommendations for chemical use.