

## No Matter How You Cut It

# The Roots Get Hurt

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*This article is condensed from a speech made by Davis at the 1961 GCSA convention.*

A REDUCTION in root growth from mowing grasses has been reported many times. In general, the closer a given grass is mowed the fewer roots it produces. Welton and Carrol, working in Ohio, studied the effect of four cutting heights on a Kentucky bluegrass — redtop — white clover sod in the field for three years (1935, '36, '37). Samples were taken

8-ins. deep to measure root development each year. The amount of roots produced under the sod cut 2-ins. high is shown as 100 per cent and the roots produced at the 1/2-in. cut is related to it (Fig. 1). Note that the difference in root production at the two heights becomes greater with time. The close-cut sod becomes weaker each year.

Juska, Tyson and Harrison at Michigan State University grew Merion bluegrass alone and in many mixtures at two heights of cutting and two levels of nitrogen fertilization. Fig. 2 shows that the root growth was more than twice as great when the grasses were cut two inches high than when cut at 3/4-in. in this greenhouse study. The effect of nitrogen, of course, on clippings and roots is evident.

### Clipped vs. Unclipped

Eliot Roberts studied the effect of mowing height on grasses in a greenhouse test at the University of Mass. (Fig. 3). Grasses were clipped at 1/4, 3/4 and 1 1/2 ins. and a treatment left unclipped. The unclipped grasses had a much greater root system than clipped treatments. The shorter the clipping, the less the root growth.

Using several forage grasses, including

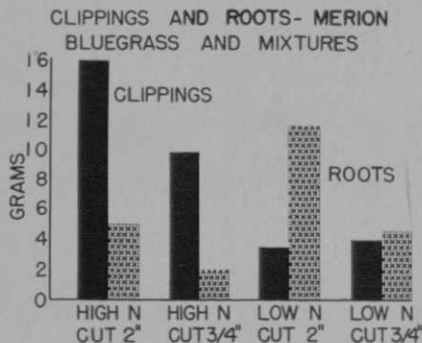
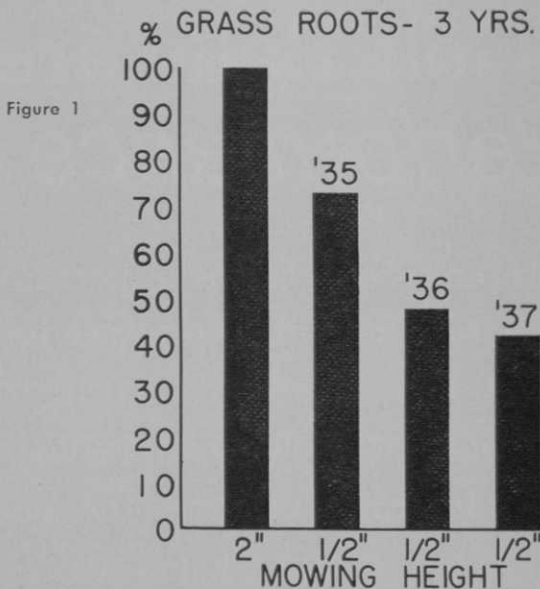


Figure 2

Kentucky blue, Crider found that many clipping treatments stopped the growth of grass roots. With the exception of orchard-grass, a single clipping that removed most of the foliage caused root growth to stop for periods ranging from 6 to 18 days. Stoppage occurred usually within 24 hours and growth didn't resume until recovery of the top growth was well advanced. When these clippings were repeated periodically, root growth of all the grasses stopped for periods that ranged from 25 to 45 days during the growing season. The percentage of roots that stopped growth varied in proportion to the percentage of the foliage that was removed.

#### Root Growth Stops

The effects of clippings repeated frequently were much more severe. All root growth stopped after the first clipping of 90 per cent of the foliage, and the three-times-a-week clippings that followed prevented root growth during the 33-day test. The repeated clippings were made at the level of the original cut. Removing 70 per cent and 60 per cent of the foliage also stopped all root growth. Stoppage of root growth failed to take place only when 40 per cent or less of the foliage was removed.

The tremendous reduction in root and top growth of smooth brome grass from a clipping treatment is shown in Fig. 4.

The data presented on the effect of mowing on root development makes it obvious that grasses on courses should be mowed as high as good use will permit.

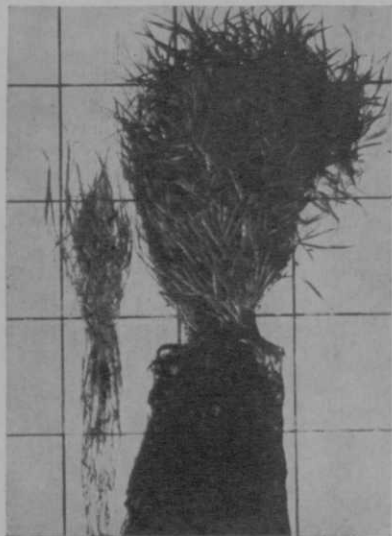


Figure 4

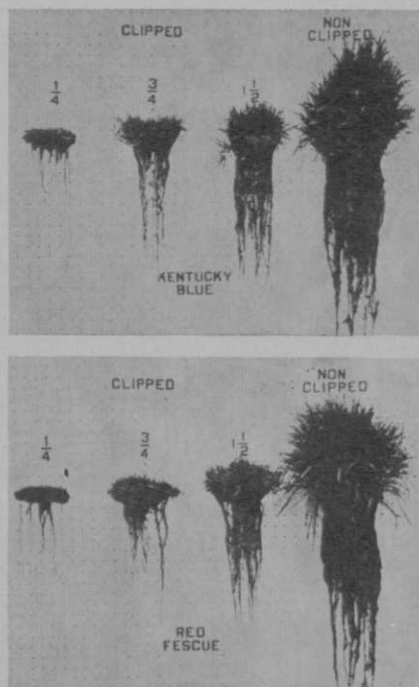


Figure 3

Likewise, the smaller the proportion of the top growth removed at one time, the less the effect on stopping or reducing root growth. Frequent mowing as high as use will permit should give the best possible root system under a given set of environmental conditions.

#### Invasion by Weeds

What is the result of a poor root system under sod? A weak sod that offers little resistance to invasion of weeds is one obvious result. A test made at the Ohio Agriculture Experimental station in which several varieties of Kentucky bluegrass were mowed at two heights for four years gave these results:

Variety	Number of weeds at	
	$\frac{3}{4}$ -in. height	2-in. height
Breeder's Merion	8	0
Penn. K-1	10	1
Wash. selection	38	2
Minn. Common lot	105	3
Delta	102	11
Park	105	8
Ky. Common lot	108	5
Neb. Common lot	150	16
Average (all plots)	91	8

The average of all varieties, you will note, shows that there are more than 10 times as many weeds when mowed at  $\frac{3}{4}$

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## Bob Duguid Winds Up Long Career as Superintendent

Robert Duguid, Sr., who learned the greenkeeping art in Scotland and brought his knowledge to Canada and later U. S. courses, retired as supt. of Timuquana C.C., Jacksonville, Fla., Apr. 30. Bob, whose son is sales mgr. of Roseman Mower Corp., Evanston, Ill., is a native of Aberdeen, Scotland. He came to this continent before World War I, worked at courses in British Columbia, served with the Canadian Army in France as a 1st sergeant and was named supt. of Evanston CC in 1923. In 1943, he left the golf business to manage a citrus farm near Dunedin, Fla. Seven years later Duguid returned to Evanston CC and stayed there two years before accepting the supt's position at Timuquana.

Bob is a charter member of both the GCSA and Midwest GCSA and at one



Bob Duguid, Sr.

time was pres. of the Georgia-Florida Turfgrass Assn. He and his wife, Nellie, also a native of Scotland, will continue to make their home in Jacksonville.

## Roots Get Hurt

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in. as at 2 ins. Even Merion and selections similar to Merion are favored by high mowing, although obviously they are much better able to withstand close mowing than other varieties and common lots.

If all other factors in the growth of grass, fertilization, temperatures, lack of compaction, etc., were ideal, mowing practices alone would prevent natural root growth. It's a small wonder that supts. have done as well as they have in learning to live with shallow-rooted grass and managing to keep it functional. Mowing as high as use will permit and cutting frequently to remove only a low percentage of top growth will help root development.

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