

Science, Mechanics and Art in Bent Greens Mowing

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The effect on turf growth of frequency and height of cut is not understood by everybody. Living plants must have leaves, or other organs which do their work, in order to make a normal and healthy growth. These leaves are factories in which the substances carbon dioxide and water are united to produce a simple sugar. The resulting sugar is the basic substance from which every other plant constituent is made. Grass is one of the few plants which can withstand constant leaf defoliation by cutting. Leaves are regenerated and the new growth performs the functions of the parts removed by the mower.

Some grasses have an erect habit of growth. The stems and the leaves grow upward. The blue grasses and the fescues are typical examples. They cannot withstand constant close cutting, especially when growth is fostered by frequent watering and heavy fertilization. The usual recommendation is to cut these grasses at $1\frac{1}{4}$ inches or higher.

Other grasses have a creeping habit of growth. The stems hug the ground and grow outwards. All of the bent grasses grow this way, but the habit is most pronounced in the creeping and the velvet bents. They take root at the nodes and make new plants that way. Even on closely mowed bent grass turf the leaf surface is sufficient to insure an adequate amount of sugar production. High cutting develops a thickly matted turf, and does not necessarily mean increased sugar production. The only active leaf blades are the green ones at the surface. Those below are brown and devoid of green chlorophyll. It is the catalyst which makes the synthesis of sugar possible and exists only in plant tissues exposed to light.

No Standard Cutting Height

There is no standard or prescribed height of cut for putting greens. Some mowers are set at $\frac{1}{4}$ inch, or less, while a few cut at $\frac{5}{8}$ inch, or higher. The range of $\frac{1}{4}$ to $\frac{5}{16}$ inch seems to be the most popular one at the best clubs. Greens on the so-called championship courses are the closest cut, usually at $\frac{3}{16}$ or $\frac{1}{4}$ inch, or less. Higher cutting is encountered mostly on the smaller courses, especially in the outlying districts. The majority of players on these courses prefer slow greens. The same result can be secured by keeping the turf

aggressive. A putting green in which the grass is making some growth is slower and holds a ball better than one where there is no growth.

Judging height of cut by the conventional method of using a gauge seldom tells the true story. Mowers of different manufacture presumably set to cut alike seldom do because they are balanced differently. Those of the same make may not be identical even though they have been set with the gauge to mow alike. The presence or absence of a front scalping roller makes a vast difference. Their use deceives the casual observer into believing that mowers equipped with them make a better and a closer cut. Their continuous use has the opposite effect. The scalping roller creates stemmy grass, which is grainy and produces a matted turf. Sooner or later the bed knife of the mower is $\frac{1}{2}$ to $\frac{3}{4}$ inch or more above the soil surface, even though it was set with the gauge to cut at $\frac{3}{16}$ inch or less. After that the surface mat builds up rapidly and becomes thicker and thicker because the side casters sink into the matted turf and the scalping roller becomes a roller in fact. It presses the grass stems into the turf and the reel cuts leaf tips only. The rolling effect of the scalping roller and the rear drum makes the turf look beautiful and smooth immediately after cutting. But looks are deceiving. The matted turf on such greens footprints badly on heavily played courses, especially around the cups. Surfaces are bumpy from imbedded stems and the ball hops over them, or it is deflected by the protruding stems which are scuffed out by shoe cleats.

Effect of Scalping Roller

Many greenkeepers never have used the front scalping roller because the cut is closer without it and the resulting turf is less stemmy and hence has less graininess. The same mower with the scalping roller removed takes off two to three times more grass. The height of cut can be $\frac{1}{16}$ to $\frac{1}{8}$ inch higher without the roller and the mower still takes off more grass than the same mower with the lower setting and a scalping roller. In the days of hand mowing, some greenkeepers removed and discarded the scalping roller, others bought a greens mower because it had no scalping roller. The casters were placed on the inside of the frame, rather than out beyond the scalping roller. Marking of the turf by

the casters was less pronounced, not because of their placement, but rather because of a tighter turf due to the absence of matted grass.

Manufacturers have not been able to eliminate scalping rollers completely from power putting green mowers. They have resorted to one of two things, brushes out in front, or a comb between the scalping roller and the reel. The brush works on tight turf because the scalping roller is set a trifle higher than the casters. It is less effective on matted greens. Then a comb set between the roller and the reel is useful. It raises the stems and the leaves so they can be cut clean by the reel.

Occasionally side casters are removed instead of the scalping roller. This practice is encouraged by some salesmen. It eliminates caster marks on the turf, and seemingly makes a smoother cut. Greens become matty, and graininess develops before long, even though a brush is used continuously. The brush retards, but does not prevent matting.

Topdressing Procedure Changes

In yesteryear, when there were crews of 12 to 20 workmen on the golf course, greens were topdressed four to six times a year. This procedure helped avoid mat formation by adding a little soil periodically. The topdressing worked down through the thin mat of grass and made contact with the soil below. The tendency is to employ fewer workmen — too few in many instances — and it is becoming difficult to get or make topdressing of desirable quality. The trend is toward less frequent topdressing. If this continues, ways of preventing mat formation must be devised. Topdressing does not work itself down through a thickly matted turf to make contact with the soil below. Mower manufacturers can help by creating a greens mower without a scalping roller of any kind, or one with a satisfactory device between the scalping roller and the reel which will raise the stems and leaves so the grass can be cut clean and the turf kept tight. Such a mower will enable greenkeepers to maintain better putting surfaces.

Infrequent mowing is bound to produce a matted turf on greens. Skipping one day a week is widespread and all right. The wartime practice of mowing two or three times a week is not enough, especially on vegetative strains such as Washington, etc. The best greens are mowed every day but one, especially during the seasons when weather is favorable and grass is growing at a satisfactory or a rapid rate. Turf growth is retarded by hot weather and practically stops in extreme heat. Raising the height of cut, or infrequent mowing, is justified then to prevent damage to plants.

Avoiding Injury to Grass

Cutting greens on oppressively hot humid days when the grass is wilting badly because of a shallow root system may play havoc with the grass. The weight and bruising effect of the drum on the mower permanently injures the wilting grass leaves. This is especially true of mowers with corrugated drums. The advantage of more traction is offset by the added bruising of the grass on hot days when weather is bad.

During the bad spell in August and September of this season, some greenkeepers mowed in late afternoon after sundown. Greens were watered lightly beforehand to revive the wilting grass. A few greenkeepers cut very early in the morning while dew was still on the grass and before heat became oppressive. Then they watered lightly and watched for wilting. A little additional water was applied promptly during the day whenever the grass started to wilt, as evidenced by blue color and footprinting.

The instance mentioned above of cutting wet grass is the exception rather than the rule. The best cut is obtained when the grass is dry. Greens are mowed in early morning in order not to interfere with players. The turf is handwatered first or poled to destroy droplets of dew and to dry the surface. Poling is desirable whenever worm casts are bad on the surface. Some greenkeepers think poling reduces graininess of the grass.

The single unit greens mower produces a ribbon-like pattern on the green, which is pleasing to the golfer. It makes for a better target. The same effect is obtained with a duplex mower, but is lost with the three gang unit. They are a labor-saving device. That advantage may be exaggerated because on some greens it is necessary to double back over areas that have been cut and risk increased soil compaction.

Green Contour Affects Mowing

Changing the direction of cut is desirable. Mowing in different directions tends to eliminate graininess. The practice is general and sensible because it makes a better surface. Severe contours may limit the number of directions. Abrupt contours also increase the chance for scalping and are one reason for equipping mowers with scalping rollers. The modern trend is to avoid steep slopes and heavy contours. Old greens containing them should be changed to make long sweeping slopes. This can be done by lifting the turf on the bad parts and replacing the sod after changing the slope of the sub-grade. The green need not be out of play if the task is done after the season ends or before spring play starts.

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As grass clippings accumulate in the catcher box their weight affects the cut because the box is placed on the front of the mower. The effect is like a fulcrum with the added weight placed on the far end of the bar. It is accentuated when the grass is damp or wet at mowing time. The cut is closer and the likelihood of scalping is increased. Operators should be trained to empty the grass catchers before or when they are half filled. This will insure a better cut green.

Close cutting right up to the edge of banks and traps alongside the green is bad practice. Excessive wear is sure to occur when the mower turns on close-clipped grass. It is caused by the twisting and bruising action of the drum. Corrugated drums are worse than smooth ones in this respect. There should be a fringe or apron of longer grass around every green, wide enough so the operator can turn the mower on it. The best plan with power-operated equipment is to lift the cutter bar slightly by bearing down on the handle just before the fringe is reached. After crosswise cutting is completed, mowing is finished by cutting once or twice around the green next to the edge of the apron of longer grass.

Apron Cutting Practice

Aprons are usually cut at $\frac{1}{2}$ to $\frac{3}{4}$ inches. Golfers may complain that this is too high when the grass in the apron is one of the aggressive types of creeping bents. The dense turf along the edge of the apron acts like a wall. It stops the ball abruptly. When the ball is lodged against this wall the use of a putter is difficult or impossible. The objection is overcome at a few clubs by cutting the fringe a trifle closer for two widths of the mower. This necessitates keeping a mower for this purpose, or cutting the entire apron by hand with a power mower at less than $\frac{1}{2}$ inch, possibly at $\frac{3}{8}$ inch.

Reasonably close cutting of aggressive strains of creeping bents in the aprons is sound practice. Otherwise they become heavily matted and shallow rooted because air does not penetrate the mat. Localized dry spots develop in summer and the grass dies. On courses where the aprons are cut with fairway units, the mat should be removed by raking and close cutting in the spring when grass is ready to start growth.

It is best to have one man who is a good mechanic responsible for the putting green mowers. He should be conversant with their mechanical features and should adhere to the recommendations of the manufacturer about adjustments, oiling, greasing, etc.

Other workmen should not tinker with them. Setting for height of cut should be made in the shop by him and checked on a green. All mowers should cut alike. The reel should be sharp and set correctly in relation to the bed knife. Reel and other bearings should be replaced at the first sign of enough wear to create play in the reel shaft. Corrugations in the turf sometimes result from a low frequency but are more often evidence that the reel bearings are worn and that the mower is not functioning as it should. Only by keeping mowers in top mechanical condition at all times can one expect to have well cut greens.

Power greens mowers are here to stay, partly because workmen rebel at hand mowing. Even the best ones appear to shock wilting grass in hot weather more than hand operated mowers. Club officials have been led to believe that power mowing of greens eliminates one or more workmen. Increased efficiency of the force is a better reason for using them because most clubs have too small crews already. The cry for greater speed to save mowing time is a desire of doubtful value. The craze for fast mowing on fairways was shortlived. Slower cutting has resulted in better cut fairways and has gone far toward the elimination of washboards or corrugations in the fairway turf. Some similar drawback is apt to occur from excessive speed in mowing greens. In time excessive speed will be frowned upon and a reasonable one, faster than hand cutting, will prevail.

STORE AUTHORITIES

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mote human comfort. Such amenities are a subtle compliment to the customer and indicative of management's regard for them.

Buyers can hardly be regarded as customers until they form the habit of satisfying their needs through a certain firm because they have found conditions that entitle them to act on their own judgment. Store fixtures that assist customers in evaluating merchandise and determining prices without personal assistance are potent factors in developing a sense of assuredness.

To rely exclusively on personal contact is expensive and in many situations, it is inadequate. If persons who pass or enter a place of business are unfavorably impressed by what they see, they may not accord a merchant the opportunity for a personal contact. Hence, modernization of buildings and equipment to promote customer comfort is essential to a full penetration of the market.