



Mechanic James Ames uses a hand grinder to taper front edge of bedknife.

Putting Greens— The Height of Cut

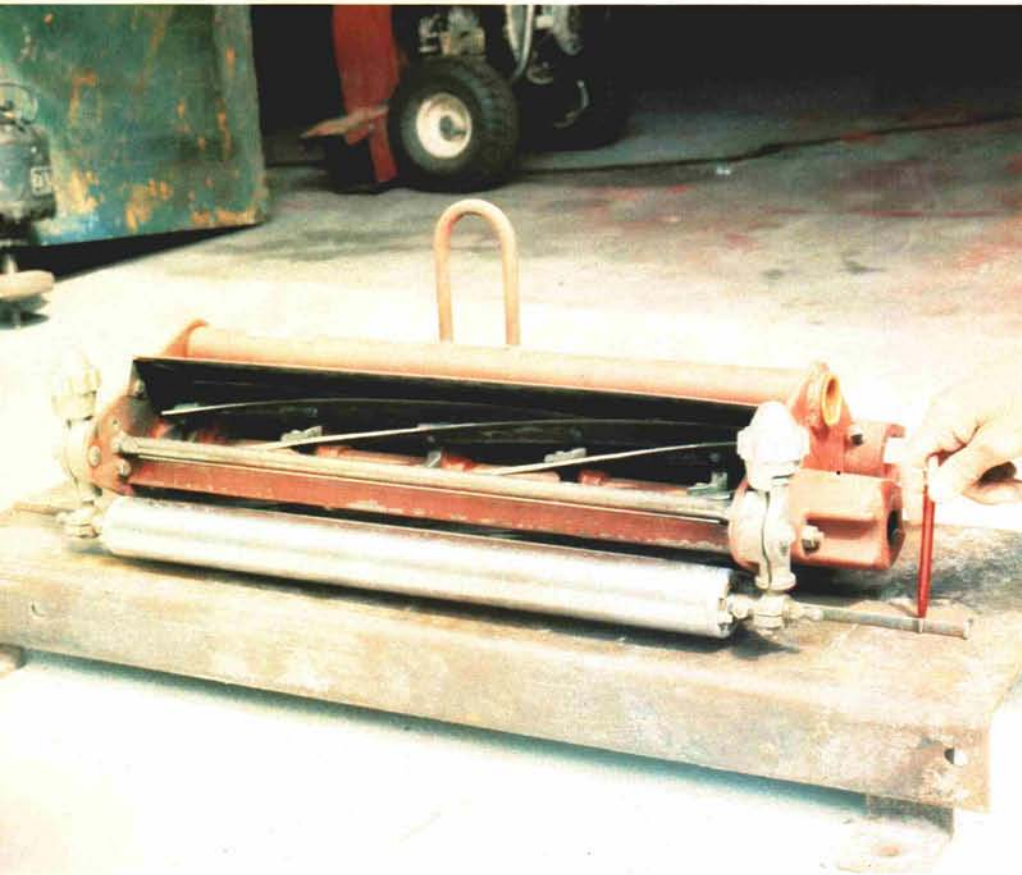
by DONALD D. HOOS and WOODROW W. FAUST

WHEN THE 1977 U.S. Open Championship was played at Southern Hills Country Club, in Tulsa, Oklahoma, and USGA officials became aware that greens were cut with

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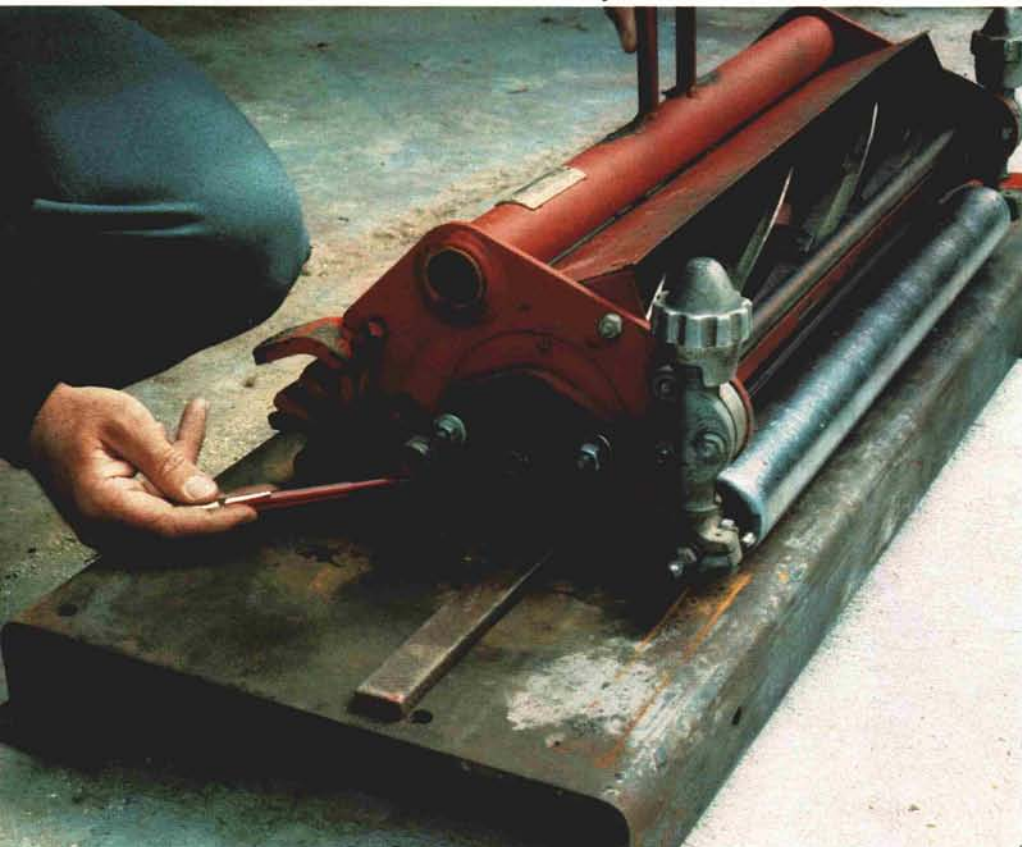
a triplex mower, they were immediately concerned that greens would not meet championship speed standards normal for USGA competitions. For its championships, the USGA recommends that greens be mowed at a height that will insure a minimum speed of 8 feet 6 inches measured by the USGA's Stimpmeter. On a triplex mower, this requires a bench setting of less than 3/16 of an inch. It is not easy to set a triplex mower to provide

a true field cut of 3/16 of an inch or less, because the triplex, due to its floating heads feature, mows 1/16 inch higher than a rigid single unit set at the same bench height. The choice of bedknives also helps determine the true height of putting green cut. There are two: one is the standard (regular) bedknife, while the other is the championship (thin) bedknife. There is a minimum difference in thickness of 1/16 inch between the standard



(Above) Note the steel platform and the metal bar, 1/4 inch thick, which is placed beneath reel to insure the reel and rear roller are squarely aligned.

(Below) Point of rear roller where adjustment is made to insure that rear roller and reel are squarely aligned. Sometimes the slot has to be enlarged to provide adequate adjustment.



(regular) and championship (thin) bedknives. Therefore, it is possible for two putting green mowers to be set at the same bench height, yet the true field cut could vary by approximately 1/8 of an inch. When you consider that an adjustment of 1/64 of an inch makes a marked difference in putting green speed, it is readily evident what a difference an added eighth of an inch will have on putting quality. Putting green grasses must be mowed at a true field cut of 1/4 inch or less to provide quality putting surfaces.

A number of factors influence the end result, aside from the mower setting. Some of the major factors are as follows:

(1) The specific variety of bentgrass or bermudagrass selected as the putting green cover. Good putting green grasses demand close cut. Even the best varieties make poor putting surfaces when they are not mowed tight.

(2) Putting green grasses require close, frequent mowing — every day of the growing season.

(3) A good operator for every putting green mower.

(4) Excellent putting surfaces receive minimal amounts of fertilizer. Greens that are heavily fertilized generally make poorer putting surfaces than greens fed lightly, as needed.

(5) Excellent putting surfaces require excellence in water management. Usually this means reducing the amount of water to a minimum . . . to only slightly more than enough to keep them alive . . . and watering each green uniformly.

(6) Excellent greens require a well-rounded preventive pesticide program to combat weeds, diseases and insects.

(7) Excellent greens require a good topdressing program using material that is compatible with the soil mixture presently under greens.

(8) Thatch must be minimal, 1/2 inch or slightly less to provide good health and proper resiliency.

(9) Various kinds of mechanical devices that attach to mowers or are used separately also affect the true field cut of putting surfaces. These are rollers, combs and brushes, vertical mowers, spikers, aerators, thatchers, etc.

Putting green quality is the sum total of all these factors meshed into a program directed by the golf course superintendent. How were the greens



at Southern Hills conditioned to attain an average field speed of more than 9 feet for the 77th U.S. Open Championship using a triplex mower? The following interview took place during a visit to Southern Hills:

Hoos: What steps and checks do you go through to assure that the mower is cutting at the height you want?

Faust and Mechanic Ames: We believe the key to accurate mower setting is to be certain that the back roller and the reel are squarely aligned. The key to insuring this is

(Left) Regular bedknife that is not tapered is thicker than the height of cut used at Southern Hills and will not fit under bolt of adjusting bar.

(Below) Superintendent Sonny Faust checks bench setting and condition of mowing unit before it is attached to greens mower.



proper adjustment on a platform that is level. A regular workbench is not satisfactory for making this check. We use a flat piece of steel that we know is not warped. A 1/4-inch flat steel rod is then placed beneath the reel, and the back roller is then positioned so that the mowing unit is sitting squarely on the steel platform.

If the reel is square with the back roller, then even if the reels are slightly cone-shaped they will still cut at the same height, because you have adjusted out the differences when you square the roller and the reel.

After the reel is ground and adjusted to the back roller, the next major step is to grind down the front face of the underside of the bedknife. The mechanic should use a hand grinder for this operation. He should start just in front of the screw holes and taper the bedknife to the front. He starts with thin bedknives and makes them thinner.

Hoos: How long does a bedknife last?

Faust: About six weeks under normal conditions and less than that after topdressing or aerifying.

Hoos: Is it difficult to adjust each of the three mowers to cut a uniform height?

Ames: No, but the same person needs to adjust the height on each unit. Different people will adjust the unit to a different feel. One person might set the height of adjustment bar tightly against the rollers and another person might set it loosely, therefore the same person should adjust all units. Once on the mower, all units will cut the same because of the floating head action of the mowers. The only difficulty occurred when it was found that the units sometimes did not turn fast enough. Therefore, it is important to use a tachometer to make sure the engine is turning at the recommended revolutions per minute. The best engine speed is a minimum

sand and verticut lightly. The last topdressing was the Thursday of the week before the championship. Greens were mowed at 3/32 of an inch until two weeks prior to the tournament when they were lowered to 5/64 of an inch, and were double mowed beginning one week prior to and for each day of the tournament. For normal operation the greens at Southern Hills are mowed at 6/64 of an inch.

Preparation for the Open Championship was not unusual. The only thing extra or unusual was double mowing the greens each day. We normally do not do this. We use a light sand topdressing program at three- to four-week intervals as part of our normal maintenance program.

Our mechanic, Mr. Ames, normally back-laps the mowing units once a week; he is very precise and professional. As you can see from the pictures, the mower will cut paper across the entire length of the reel-bedknife contact. It is very important to have sharp mowers to produce a high-quality cut when mowing at precise heights below 1/4 inch.

By grinding the thin bedknife, we can lower the mower to almost 2/32 of an inch before the bedknife is resting on the ground.

After the initial setup of a unit, which involves several hours of work, subsequent adjustments are not difficult and the height of adjustment normally takes about 20 minutes per mowing unit.

Another important key to proper adjustment is that all changes in mower height are made with units off the mower and positioned on a steel platform where the mechanic can see what he is doing. After adjustment, the mower is field-tested to see if it is cutting at the desired height. If the grass does not look tight enough, then the unit is carefully adjusted until it does.

Greens are the most important playing areas on the golf course. They are costly to maintain. Proper mower setting is a small but very important part of putting green management.

Figure 1.



After this is done the height of cut is set the same as on any greens mower.

Hoos: What is the thickness of the bedknife you use? Do you grind it down before you put it on the mower?

Faust: The thickness of the front edge of a championship bedknife is approximately 5/64 of an inch. Using a hand grinder to taper the bedknife, after grinding, the front edge is about 4/64 of an inch.

Hoos: Are all bedknives uniform in thickness?

Faust: No, they are not uniform in thickness or shape. A regular bedknife has no taper on the front edge. A thin bedknife or championship bedknife has a small taper behind the front edge. It is up to us to make necessary adjustments when new bedknives are received from the manufacturer.

of 3,800 rpm for normal operation, which is the manufacturer's recommendation. During the Open Championship we found it better to accelerate to 4,200 rpm, but this was only for a short period of time. Continued operation at this speed would damage the equipment.

Hoos: What was the gauge setting used for cutting greens during the Open Championship in 1977?

Faust: Five sixty-fourths of an inch.

Hoos: How often were the greens cut during the week of the Open? When did you begin mowing at this height?

Faust: The maintenance program before the Open began with aeration and topdressing during the first part of March.* Then at three-week intervals the greens were topdressed with

*Normally, the USGA recommends that greens not be aerated in spring prior to the Open Championship, but growing bentgrass in Oklahoma weather required it be done, otherwise the turf would suffer undue stress in summer.