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The President's Message

Rain, Rain Go Away, Come Again Some Other Day (when we need it).

Boy, has it been wet! This spring and early summer have really put the Superintendent through a test of his ability in public relations. How do we explain to the members why the course is closed or why the golf cars are restricted?

We can thank the good Lord that the majority of our golfers understand, and that they have enough confidence in the Superintendent's judgement. It is a tough decision to make in the early morning hours when the remainder of the day may be sunny and bright. But it is a decision that must be made from time to time in order to prevent compaction and tire ruts that take time to repair and heal.

Most courses rely on the Superintendent to make these important decisions. Let's hope they continue to do so.

Your President,
Ted Woehrle

USGA Open Championship

One June 9 and 10, 1973 I was fortunate in being able to attend a practice round at the site of the 1973 Open being held at the famous Oakmont Country Club in Oakmont, Pa.

Host Superintendent, Lou Scolzo, had the course in excellent condition despite some heavy rains on Tuesday. Because of the soft greens the scores were quite low for the Open, but the gallery enjoyed every minute of it. They lose to see birdies and eagles instead of bogies.

Lou told us that he always double cuts his greens daily. I have never seen shorter turf on golf greens. The only other greens that compare would be those at Wilbur Water's Inverness Club in Toledo, Ohio.

Congratulations, Lou for a great job in preparing your course.

– Ted Woehrle

In any field of scientific endeavor anything that can go wrong, will go wrong. Left to themselves they always go from bad to worse. If there is a possibility of small things going wrong, the one that will go wrong is the one that will do the most damage. Nature always sides with the hidden flaws. If everything seems to be going well you have obviously overlooked something. – A PESSIMIST

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Al Kaltz is nearing the end of his three-year term of service on the Board of Directors of Michigan & Border Cities Golf Course Superintendents Association. He was elected in 1970.

Al has been at Maple Lane for 34 years. He is Assistant Superintendent to Superintendent Clarence Wolfrom, Sr. His long term of service was interrupted only by a hitch in the U.S. Army from 1941 - 1945.

Al has helped in the development of Maple Lane, which, with its 54 holes, today is rated as the largest and one of the finest public courses in the United States.

Al Kaltz came to Maple Lane when he was 18 years old and learned the business from the ground up, so to speak. He has been instrumental in the designing and building of 36 holes since coming to Maple Lane.

Al has a wintertime avocation - the growing of hothouse rhubarb - which he has developed into a profitable family operation. His wife and six children help Al conduct the operation on Al's Macomb County farm. Macomb County, incidentally, is the largest producer of hothouse rhubarb in the United States.

MBCGCSA Fall Golf Day

The 8th Annual Turfgrass Research Benefit sponsored by the Michigan & Border Cities Golf Course Superintendents Association, will be held on September 17, 1973, at the Bay Pointe Golf Club.

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from the column **CHARLES PRICE GOLFER AT LARGE**
in the June issue of **GOLF MAGAZINE**

A Talk With the New Breed of Greenkeeper

Next to those amateurs who think they can design a golf course better than a professional architect, the ones who bug me most are those who think they can maintain a course better than a professional greenkeeper. No matter how immaculate the course, they always seem to be able to find some fault with it. Let them play three days before the National Open at Pebble Beach or Oakland Hills or Winged Foot, when such courses are as clean as billiard cloth, and they'd somehow manage to find a daisy in the rough and holler holy hell about it.

This picayune nonsense wouldn't bother me so much were it not for the fact that the golfers who holler the most couldn't keep up the front lawn for a doll's house. Give them a gang-mower and they couldn't find the ignition. And, for some reason that is strange but true, they are the very ones who never smooth out a bunker even though you surround it with enough rakes to constitute a picket fence. If you want the world's biggest weed nursery, just hand your golf course over to them for two weeks. You'll have tees that look as though they had been made out of ripple soles, fairways that play as though they had been planted with creeping-rock, and greens that putt as though they were peanut brittle.

Anybody who knows anything at all about maintaining a golf course is a member of the Golf Course Superintendents Association of America, an organization of about 3,500 persons who are professional greenkeepers. Several years ago, for some reason I have never been able to capture, this group changed their name from the Greenkeepers Association of America to what it now is. Perhaps they got sick and tired of people calling them greens keepers - that is, in the plural - when in fact they were keepers of the green, which is to say, the whole golf course. Hence, the proper term "greenkeeper," just as it should be "green fees," and not "greens fee," as though all they had to do was mow 18 putting surfaces and forget the fairways, the rough, the hazards and all the rest of the joint.

Greenkeeping has never been one of the more glamorous professions in this ancient game, although to this day in Scotland the greenkeeper's word is law, above even that of the head professional, the Club Secretary or the Captain of Golf, which is a highfalutin' title for the unpaid president of the club. When the greenkeeper over there says the course is closed, for example, it's closed, and he wouldn't care if the Duke of Edinburgh and the Prince of Wales were standing on the first tee getting ready to play a match for the crown jewels.

In recalling greenkeepers I have known, only two come to mind who received any degree of national recognition. They are Emil Loeffler, who was the first professional at Oakmont as well as its greenkeeper until his retirement in 1947. The other is Joe Valentine, for many years the greenkeeper at Merion, who discovered Merion Blue Grass, an almost revolutionary strain that has since been widely planted throughout the country; indeed, throughout the world. Anyway, those two kept their courses in elegant condition at a time when you had to get rid of crab grass and other agronomical stuff infesting

Continued on Page 8

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golf acreage by getting down on your hands and knees and picking it out, and when cutting healthy grass was done with mowers only one era removed from being horsedrawn.

Now there is a new breed of greenkeeper, no more heralded than the old, but in most cases college-educated in agronomy and so sophisticated in herbage, sedges, rushes, stems, leaves, flowers, bracts, fruit, grain, pesticides, insecticides, and all the other ins and outs of this little-known field as to make you feel they could build a Japanese garden blindfolded.

At my home club - The Sea Pines Plantation Club, on Hilton Head Island, S.C. - our three courses and a fourth still under construction are supervised by one of these younger Turks. His name is Bill Carson, and he knows grass the way a pianist knows a keyboard. Carson holds a degree in landscape design from Clemson University, one of the pioneering schools that teach some of the intricacies of golf course superintendence. Although only 32, Carson has managed to work his way up to the title of General Golf Superintendent at Sea Pines in only eight years. As such, he supervises a staff of 28 men (one other superintendent and assistant for each course, plus ground crews) and the use of $380,000 worth of equipment. If you think seeding your lawn is a problem, take this figure into consideration: Last year Carson and his men planted almost 40 *tons* of it. As if these logistics were not headaches enough, Carson has to grapple each day with the cold fact that the cost of maintaining a golf course - any golf course - is spiraling at the rate of nine per cent each year. Yet, six times a day Carson has to listen patiently to the unsolicited advice of nuts like me who couldn't raise a geranium in Hawaii in the middle of May.

Bill just smiles when I mention all this to him, having the patience of a man twice his age. "I don't blame people for making suggestions," he says. "In fact, I welcome them. After all, we have members here who have been playing golf since before I was born and most of what they have to say is very constructive. Gosh, even superintendents disagree among themselves on how a golf course ought to be kept up.

"Do you know that it wasn't until last year that our association got around to officially declaring that *poa annua* is a weed? That is, a plant out of place in the natural environment of other things? Now, weed or not, *poa annua* has been around as long as people have thought grass is worth taking care of. But it is not necessarily bad for grass. On the contrary, it can be good for grass in some parts of the country. Lord knows, there's not a better maintained golf course in the whole world than Augusta National. The people there spend all year bringing the place to perfect fruition for the week of the Masters Tournament Despite all their efforts, though, *poa annua* keeps creeping in every three years or so. It doesn't hurt the turf there, and when you lower the mowers as low as they do for the Masters, it putts just as true as any grass strain you care to name. But *poa annua* is white, not green, and if you are the sort of perfectionists they are at Augusta National it becomes unsightly. So they keep trying to kill it off for appearance's sake, just as I do.

"Six or seven years ago, maintaining a golf course was largely a matter of picking crab grass off the greens, mowing the fairways, and keeping the course green. Today, I might have a fairway mowed as often as six consecutive times before it meets our standards. And all this has to begin as early as six in the morning, weather permitting, so that we can have all 54 holes ready for play

Next Page

New Breed Cont.

before the golfers get to them. If we don't stay five or ten minutes ahead of them, we have to cut off our machinery and stand around while they play through. This can cut our efficiency as much as 70 per cent.

"So, there is one of the dilemmas of keeping a golf course up to par. You can't properly maintain one while golfers are playing it, and you can't have one unless they do play it. Speaking of play, last year we had - let me see now; I've got the figure right here somehere - 108,700 rounds of golf played over our three courses. Lots of clubs - and I don't care how many courses they own - wouldn't have that much play in *ten* years. But we are not seasonal, unlike the north. Play here goes year round. As a matter of record, one of the busiest days we have ever had took place late one February. Consequently, play here is not concentrated, unlike - let's say - the Chicago area, where people have a six-month to eight-month season and where play at a club might be restricted to 300 or so members. Being a resort community, we have a lot of guests and a lot of members who play here, there, and everywhere. As a result, all sorts of bastard strains of grass are implanted into our fairways and greens through their spikes. It can't be helped or avoided, but it is nonetheless a fact of life.

"Would you believe my posting a sign on the first tee of any of our courses saying 'Please Do *Not* Replace Your Divots'? I mean, would you believe that? Well, our courses are planted in two different strains of Bermuda, Tifway and Tifdwarf as they are known in the trade, depending upon how old the course is and whether the Bermuda has been planted in the fairways or on the greens. But the point is - and this is argumentative among even professional greenkeepers- that replacing a Bermuda divot can do more harm than good to a golf course.

"Bermuda, you see, grows almost sideways, whereas rye grows, comparatively speaking, almost straight up. By replacing a Bermuda divot, then, you are in effect impeding its natural growth; the divot keeps the grass strands from reaching each other. Consequently, by not replacing the divot, you give Bermuda a better chance to grow and, incidentally, let the mowers chew up the divots so that they can re-germinate the golf course. But, as I say, this is a debatable point among superintendents. I happen to think that not replacing a Bermuda divot is wise, although lots of others will d i s a g r e e with me. So why shouldn't I listen to the suggestions of members who have been playing golf 30, 40 years or more."

There you have it, then. Among modern-day greenkeepers - superintendents - there is consternation over whether or not you should replace a divot, a subject that would have been dismissed with a toss of the hand in my day and would have been c o n s i d e r e d heresy in Emil Loeffler's. Poor Bill Carson. Just think! Fifty years from now he'll be sitting in his wheelchair and some member will come up to him and tell him he's doing e v e r y t h i n g old-fashioned. He's still raking sand traps.

Once upon a time a beautiful girl went walking through the woods. As she approached a bridge she heard a hoarse voice cry out: "Please don't step on me."

The amazed girl looked around and saw no one. Then she spied a little frog in the middle of the road, the little frog looked at her and spoke again. "Don't be frightened," he croaked. "I am not really a frog. I am a handsome prince. A wicked witch has cast a spell on me and until some kind person takes pity on me and gives me some food and shelter I cannot break the spell."

The sympathetic girl picked the little frog up and took him home. There she fed him and gave him a soft pillow beside her to sleep on.

When she awoke, to her surprise there was a handsome prince beside her . . . but her mother never believed the story.

Changes in Putting Green Construction Concepts - Builder's Viewpoints

by JAMES L. HOLMES
The Green Makers
Bryan, Texas

This paper pertains primarily to bentgrass greens, especially greens suitable for the culture of buntgrass in the South. Nevertheless, let me say here and now, that greens built properly will support both bentgrass and bermudagrass in a superior fashion - anywhere. But there is a growing demand for bentgrass greens, primarily for two reasons: 1) bentgrass is recognized as presenting a superior putting surface, and 2) the pesky bermudagrass transition period is avoided.

Of course there must be assurance that bentgrass will perform throughout the entire season in the South. Certain types of bentgrass have done well for a number of years in Gatesville, Texas; Ft. Smith, Arkansas; and Nashville, Tennessee. There is every reason to believe, if green construction is proper, that bentgrass will perform excellently as far south as mid-Florida and southern Texas, or in areas where the bermudagrass transition factor is a problem.

Building Procedures

In the March-April 1959 issue of *The Golf Course Reporter,* I presented a paper, "Factors in Building a "Green". Most of the pertinent information contained in this article was obtained from reported work done by Howard Kunze and Ferguson at Texas A&M. Subsequently, the USGA Green Section published its "Specifications for a Method of Putting Green Construction" (September 1960 issue of *USGA Journal & Turf Management).* Since that time the specifications have been used as a standard for construction of putting greens. It continues to be the most valid building method which, when used, makes it possible to check whether an architect and builder are indeed following exact construction specifications.

The specifications are readily available and no doubt most superintendents are familiar with them. Of primary concern with these specifications is the assurance of rapid and adequate surface and subsurface drainage along with built-in guarantees of sufficient moisture retention and available air.

In such specifications, a layer of gravel is specified as to particle size because it is essential that finer soil particles in the soil mixture above do not filter down into the gravel. Obviously, if this occurs a soil seal

Continued on Page 13

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Thursday, September 13, 1973 has been set as the date for the annual Fall Field Day at Michigan State University, East Lansing, Michigan.

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Putting Green Changes Cont.

can be formed, thereby stopping necessary downward water movement. The factor here has to do with the "7 times diameter" size relationship. Explicitly, if a material is smaller than seven times the diameter of the pore spaces made by larger sized material, the smaller material will filter into the voids of the larger material if the smaller material is placed over the larger. As an analogy, take a room full of basketballs; if you pour a bunch of marbles over the basketballs they will filter down amongst the basketballs. But, place a layer of baseballs over the basketballs and they will not fall between the basketballs. Then place the marbles over the baseballs. So, either a sand layer of known particle size must be placed over known particle size gravel or, a known and, recognized size gravel must be used and the size relationship of the soil mix to be placed over the said gravel recognized. It has been observed in field work, that if a "buckshot" type gravel or very coarse sand which contains no fines or particles larger than 1/3" is used, a suitable soil mix will not filter into this type material in sufficient quantities to interfere with water drainage. Thus, with diligence in selecting materials and in building, the 1-1/2" sand layer recommended in the specifications can be eliminated.

The principle known as capillarity or capillary attraction is of primary concern in the entire process of building greens according to specifications and subsequent culture of a suitable putting turf.

As a review of capillarity; water likes water and will adhere to itself. This can be called internal or column tension or cohesion. Further, water will wet most other things such as your hand, a particle of soil or a piece of material used in making ink blotters; this is called adhesion. The combined action of cohesion and adhesion results in capillary action or capillarity.

As an example, place a glass tube with an extremely small bore in a cup of water. The water will rise a considerable and calculable distance up the tube. The explanation is that water is wetting the inner sides of the tube thus drawing water up the tube against gravitational pull. Further water molecules are attracted to each other so the entire column of water moves along upward.

Another well known example is the "blotter". Place an old standard pen filled with ink on end with the nib pointed upward; then hold a blotter over the nib. Ink in the pen will move up - out of the pen - and into the blotter. The air holes or capillaries are smaller in the blotter than in the pen; so through the process of cohesion

Next Page

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Putting Green Changes Cont.

and adhesion ink moves upward and is held there.

So, comes the crux as to why the green building specifications were devised and why they are so exacting in their structural demands. It becomes immediate apparent that the specified layer of gravel must have a known diameter (void) size relationship to the mixture above and that this layer of gravel stops or limits downward movement of water (or drainage) as its first necessary function. The soil mix above the gravel contains myriad of fine capillaries where the gravel basically contains none. In other words the soil mixture has a great affinity for water whereas the gravel has little or none. So, in effect, a "blotter" is placed over a void, or the system will work properly if it were possible to place the green mix on pillars or suspend it in air.

Another variation, in addition to elimination of the sand layer from the published USGA Green Section specifications, is that we have found through actual field work that the infiltration and percolation rate of water need be increased beyond the 1/2 to 1-1/2 inches per hour as originally specified. Simply, water (moisture) does not drain from the soil surface with sufficient speed to allow culture of bentgrass in the South. Activity of disease-causing fungi, primarily those which cause brown patch, grease spot (pythium), and fusarium blight, is the reason we have concluded that infiltration or percolation rates of four to seven inches per hour is most successful. Actually 4.75 inches per hour seems to be optimal in most cases.

The soil mix used to support the grass plant must - in addition to and I mean *absolutely* must - meet a number of requirements (infiltration and percolation) if the entire process is to be functionally and culturally successful. These are:

1. Numerous experiments indicate that a soil which, *when drained to field capacity,* holds 50% air and 50% water in the pore spaces, will provide the most suitable condition for support of aerobic plant growth.
2. A soil wherein 1/2 the total volume is void or "space" is most suitable.
3. In practice such a soil can be economically produced. (Actually, about the best which can be developed with native sands is 38 to 40% total void space, but we find this is adequate.)

Now comes the clincher for this method of building, and why it has been successful in allowing development of bentgrass putting greens further and further south.

When the entire green is finished the depth of the green mix itself must fall within known limits after compaction and not within some limit a builder or architect proposes or decides. The perched water table in the soil mix above the gravel (even when percolation and infiltration is at the 4.7 in/hr. level) will hold and build up a full hydrostatic head until the water level reaches 8-9 inches. At this time gravitational pull overcomes capillary forces and the contained water will flow into the gravel. Of course, during construction, adequate tiling to take care of this excess water has been installed.

Now column tension (cohesion) takes over and the water flowing from the soil mixture and entering the gravel will pull more water along with it. If the soil mixture contains proper pore spaces, just about exactly 1/2 the contained water in the soil mixture will be retained after flushing action. In other words, capillarity has overcome gravitational pull and column tension. So, you see, if the soil mix is too shallow it will be constantly wet as a sufficient hydrostatic head cannot be formed to cause drainage. On the other hand, if the soil mix is too deep the hydrostatic head will "break" before

Next Page

Putting Green Changes Cont.

the surface or near surface receives adequate moisture. This will result in a powdery dry surface as a constant problem.

Even though adequate and properly adjusted sub-surface drainage is assured with this construction it remains essential that rapid and adequate surface drainage be assured. This is especially true when cultivating bentgrass further south and out of it's more natural habitat. So, be duly careful that no one allows any water holding pot holes to develop during construction and final grading.

Progress to Date

In building specification greens a number of troublesome problems can develop. Economy is one. In the beginning we found it difficult to produce a uniform mixture when sand, soil and organic matter were required in the mixture. It works out that with a three-way mix you are just about forced to use a mechanical soil mixer. This is expensive. Even then, the material which comes out leaves a lot to be desired. However, a two-way mix is inexpensive and simple. No mixing machine is needed - the use of a front end loader or clam is sufficient. Place the two ingredients adjacent, mix in one large pile (in predetermined proportions), turn once, load on truck (another turn), dump on green (another turn), then doze out (another turn). In the end, a uniform soil mixture results.

Perhaps a native or natural sandy soil could be found which would work. To my knowledge, the first time this was approached was by myself and Dr. Marvin Ferguson, President of Agri-Systems of Texas, Inc. We selected a number of native fine sands from a pit in the Houston area. As you no doubt are aware, Dr. Ferguson is a pioneer in laboratory methods for physically analyzing a soil for use on a putting green, built to specifications. The selected sandy soils were thoroughly tested and one was found to contain 2-3% silt, 3-5% clay and the rest fine to medium sand. After compaction it was determined that 4.72 inches of water per hour would infiltrate and percolate, and the hydraulic head would indeed "perch".

As a result, in five recent situations local searches were made for the type of soil known to fall within the limits determined by the laboratory. These included the rebuilding of Hardscrabble Country Club, Ft. Smith, Arkansas in 1970; the construction of Sebastian Country Golf Course, Ft. Smith; the rebuilding of No. 13 green at Bellerive Country Club, St. Louis, Missouri, in 1971; the rebuilding of two greens at Northwood Country Club, Dallas, Texas, in 1970; and for Fianna Hills Country Club Golf Course now being constructed in Ft. Smith.

In every case, adequate deposits of this sandy soil were located, always adjacent to rivers, in old waterbeds. To date, with Hardscrabble Country Club

Next Page

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Putting Green Changes Cont.

being the oldest, greens containing this sandy soil have produced superb bentgrass putting greens.

We found that considerable well rotted sawdust was available in the Ft. Smith area. It was inexpensive so we used it. Sawdust has been used as a suitable source of organic matter for many years. It seems that hard wood dust is usuable even when fresh and pine sawdust loses its toxic effects after three years of maturation.

The contoured putting sub-surface is ringed with native "on site" soil, leaving a vertical bank 15 to 17" deep. A vertical sheet of 4 or 6 mil polyethylene is placed on this bank. The reasoning here is that the sandy soil in the green proper has a drastically different relationship to water than the adjacent native soil and the plastic is used to separate this interface.

Of course the basic contours must be developed on the sub base of the green (which is 15 to 17" lower than the surrounding area). These contours must be accurate within 10% so as not to allow a variation from the 10-14 inches depth of the soil mixture required.

Penncross bentgrass, seeded at a rate of two pounds per 1,000 sq. ft. has been used with success. Fertilizer used has been a 1-1-1 ratio inorganic material. It is applied at a rate which provides two pounds of N per 1,000 sq. ft. In addition, we apply 50 pounds of Milorganite, and five pounds of Sulpomag and five pounds of potassium sulfate, each at five pounds per 1,000 sq. ft. Later, dolomitic lime is added at the rate of 50 pounds per 1,000 sq. ft.

Invariably, through chemical soil tests made by the Milwaukee Sewerage Commission, there is a shortage of magnesium. So, Sulpomag has been applied twice a year at Hardscrabble.

Next Page

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Putting Green Changes Cont.

To date adequate levels seem to be holding.

Planted surfaces are kept as wet as a rice paddy until grass is 1/2" (mowing height).

Possible Problems

Actually there seem to be no truly serious problems or any problems which cannot be overcome. One thing to watch carefully - when a green is built with high sand content and high infiltration rates - is that soil with a greater percentage of fines (silt and clay) simply cannot be placed on the green surface or be used as top-dressing. *All topdressing must be identical or sandier in nature.* Do not allow collar soil to wash on to green surface. This is essential. If silt or clay is allowed on the green soil, the green immediately becomes sealed. Diseases, non-drainage, scald, wet wilt, etc., then develop into serious problems.

A tyro had best not attempt to build these greens. Constant supervision by a conscientious, knowledgeable builder is necessary. Corners cannot be cut!

Plenty of plant nutrients, especially at the onset, will be required.

Dry wilt - but never wet wilt - can be a problem and must be watched for during windy days, especially in July, August, and September. When wilt is noticed, water and water

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Putting Green Changes Cont.

heavily - no syringing.

To my knowledge, diseases have not developed into a serious problem on any green built this way in the South. Hardscrabble Country Club budgeted well over $4,000 for fungicides in 1971, but less than $1,500 was expended. Mind you, this is on bentgrass, grown in the South, where you are not supposed to be able to grow bentgrass because of disease.

Summary

"Specifications For A Method Of Putting Green Construction", since being published by the USGA Green Section in 1960, has proved to be the superior guide for building a green. We now suggest slight variations.

The point we have made is that here is a system of building greens which has proved to be successful in the South and, of extreme importance, allows for accurate checks and determinations as to whether construction actually meets specifications.

To date, greens have been built quite far into the South which support excellent bentgrass turf. Putting green bentgrass turf is desirable over any other. Care or precaution must be taken in construction to be absolutely certain it is done right. Also, intelligent maintenance is essential.

A mix which includes a naturally deposited sandy soil and saw dust has proved to be eminently successful as a medium for the culture and support of bentgrass in actual field conditions. Accurate tests must be made to be absolutely certain that the proposed mix will indeed handle water as required. Primarily, this includes adequate infiltration, percolation, water retention (perching) and drainage.

During this talk, we have stressed the culture of bentgrass in the South because it is there that it meets its most crucial test. Obviously, either bentgrass or bermudagrass, in their element, will produce superior turf when greens are constructed properly.

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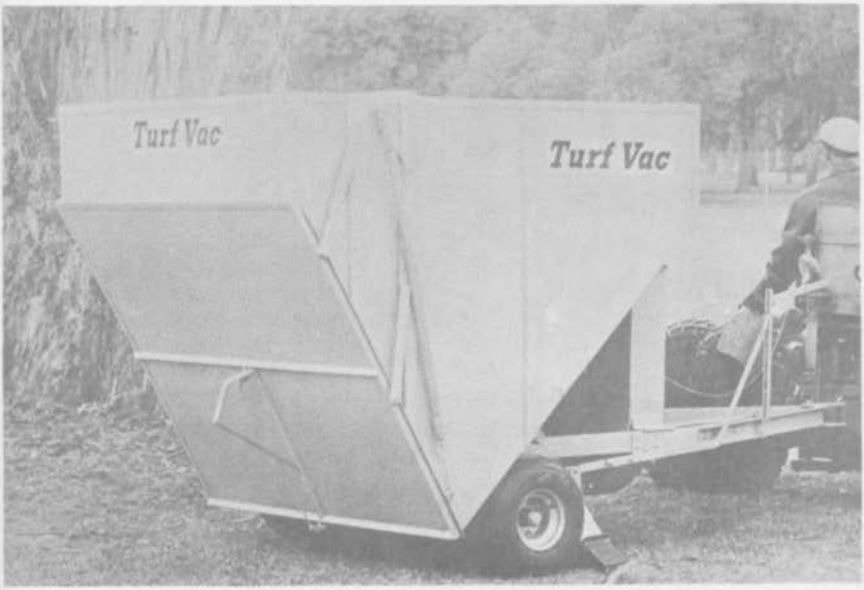

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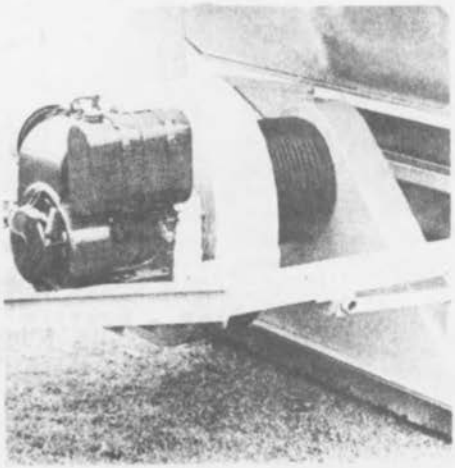

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