Renovation Techniques and Management Strategies for Bentgrass Fairways

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In recent years, there have been increased demands by the golfing public for higher quality fairway turf. However, maintenance of high quality fairways is often precluded by the dominance of **Poa annua** over other fairway grasses. **Poa annua** is susceptible to disease and "burn-out" when exposed to summer stresses, and high inputs of water and pesticides are often required to avoid large scale losses of fairway turf. Past attempts to establish Kentucky bluegrass or creeping bentgrass fairways have met with little success due to the competitiveness of **Poa annua**. However, new, innovative management strategies and improved renovation techniques have stimulated interest in bentgrass fairway establishment and maintenance. In this column, I will discuss fairway renovation techniques with Roundup herbicide, and subsequent management practices that reduce competition and reinvasion by **Poa annua**.

Before beginning renovation activities, it is critical that the membership be well informed as to procedures and consequences of spraying Roundup (brown grass!). In general, renovated fairways will have to be closed for one to several days, and cart traffic will be restricted. Other factors to be considered before renovation relate to construction aspects and changes in fairway design. For example, sprinkler heads can be raised, leveled, or relocated, and drainage problems can be corrected. Also, the size, shape, and contour of fairways can be altered during renovation, which can lead to reduced acreage and allow for more efficient lightweight or triplex mowing.

Several renovation techniques have been used by area superintendents. One of the easiest and least disruptive methods is to apply Roundup followed by overseeding directly into the dead turf. A slit or groove seeder can be used, or seed can be dropped or broadcast onto the surface of the dead turf, then matted or raked to the soil surface. These methods are most suitable for fairways that do not have excessive thatch build-up. Seedling establishment is often reduced in heavy thatch, and poor mowing quality and increased disease problems may result.

A second, more disruptive renovation method includes intensive core cultivation prior to overseeding Roundup treated fairways. Following cultivation, soil cores are shattered and matted-in provide top dressing. This method can lead to improved seedling establishment and better turf quality when fairways have a moderate thatch layer. Fairways with excessive thatch build-up should undergo a multi-season thatch reduction program before renovation to assure acceptable results.

When bi-directional slit seeding is conducted following Roundup applications, diamond shaped patches of turf are often torn loose. These "diamonds" must be replaced or soiled over to keep the fairway surface level. An alternative method which reduces or eliminates this problem is to carry out all cultivation and slit seeding **before** spraying Roundup (e.g. Olympia Fields Country Club). In this approach, Roundup must be sprayed as soon as possible after seeding to prevent injury to germinating bentgrass. Perhaps the best solution to the diamond tearing problem is to scrape off and discard the dead mat and

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thatch before overseeding (a road grader was used at Butterfield Country Club). An excellent seedbed can then be prepared, which will greatly enhance bentgrass development.

Late summer or early autumn is generally regarded as the best time to renovate fairways, primarily because the golf season is winding down at this time. However, **Poa** seed germination increases in autumn, and reestablishment and competition by **Poa** can become a problem. Since bentgrass seed germinates at higher temperatures than **Poa annau**, it is advantageous to begin renovation in mid to late August, before the arrival of cooler temperatures. Also, many area superintendents have applied the herbicide bensulide 5 to 6 weeks after renovation in an attempt to reduce **Poa annua** emergency.

At present, there are only four of five seeded varieties of creeping bentgrass available in the Chicago area — Penneagle, Penncross, Seaside, Prominent, and Emerald. Penneagle and Penncross have been the preferred varieties for renovation work. but seed shortages have led to blending of these varieties with Seaside. In general, Penncross and Penneagle perform well in most fairway situations. Seaside is less wear tolerant and disease resistant, but can provide an acceptable turf if blended at 50% or less of the total. Prominent and Emerald have not been used frequently in northern Illinois, although Prominent has performed well in several university tests.

Once fairway renovation is complete and a solid stand of turf is established, one can expect to have around 50-70% of bentgrass — with the remainder composed of **Poa annua**, other grasses, and weeds. The objective now is to increase and maintain the bentgrass population as high as possible (80-90+%) by utilizing sound management techniques. These include alterations in fertility, irrigation, and mowing practices, along with responsible thatch management and use of herbicides or plant growth regulators. Please note that no single change in management will have the desired effect; an integrated approach utilizing several key strategies is required.

It has become apparent that bentgrass fairways require much less additional nitrogen than bent putting greens. Annual application rates as low as 1 to 2 lbs/1000 ft^2 or less are now common. **Poa annua** apparently requires much more N than bentgrass under fairway conditions, and low N rates greatly reduce the competitiveness of **Poa**. N applications in late spring (during **Poa** seeding) and in late autumn to early winter (''semi-dormant'') may also favor bent growth, since at these times **Poa** root absorption of nutrients is thought to be lessened.

By most accounts, **Poa annua** also requires levels of phosphorus than bentgrass when intensively managed. Most soils in northern Illinois contain adequate P to sustain bentgrass growth, with the exception of high pH soils. Because of this, area superintendents have reduced or totally eliminated P applications in an attempt to further stress **Poa annua**. Now, following renovation and bentgrass establishment, only potash application rates remain as high as before renovation.

Controlled reduction of irrigation frequency is also of importance to successful bentgrass fairway management. Infrequent irrigations that deeply wet the soil profile favor bentgrass rooting and water uptake. When properly maintained, bentgrasses have

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deeper root systems and are more heat and drought tolerant than **Poa annua**. Shallow rooted **Poa** is placed under stress when topsoil dries between irrigations, and this further reduces its competitiveness. Infrequent, deep irrigations can be made more efficient and uniform by the use of wetting agents which improve water penetration in hydrophobic areas.

Lightweight mowing of fairways has been frequently cited as the most important factor in increasing bentgrass populations in mixed bent — **Poa** turfs. Examination of possible reasons for the success of this practice reveals a complex interaction that involves plant responses to changes in soil compaction, wear, and nutrient availability. Alleviation of compaction and wear allows for more aggressive bentgrass shoot and root growth; the vigorous root system is better able to utilize soil water and this leads to reduced irrigation requirements. Clipping removal is important since it prevents leaf decomposition in the turf canopy. This reduces heat stress from the "silage effect," removes possible cites for development of disease organisms, and decreases the amount of available N and P by disrupting nutrient recycling. Also, removal of **Poa** seed heads has obvious advantages, especially if the annual biotype of **Poa** predominates.

In addition to the above strategies to favor bentgrass dominance, several chemical options are available to further inhibit **Poa annua**. Herbicides that have preemergent (bensulide) and postemergent (tricalcium arsenate, endothal) activity against **Poa** are available. Plant growth regulators such as fenarimol (Rubigan) and flurprimidol (Cutless) retard **Poa** growth, and repeat applications can gradually reduce **Poa** populations in bentgrass fairways. Applications of mefluidide (Embark) and Aquagro reduce seedhead production, but do not alter bent:**Poa** percentages to a great extent. None of these treatments are totally selective, and phytotoxicity to bentgrasses may occur. If use of these products is desired, applications should first be made on small test areas to determine appropriate rates and timing.

As a result of conversion to bentgrass fairways, further changes in management will be required. An aggressive thatch management problem will be necessary to maintain overall quality and playability of fairways. Disease and insect control is important to maintain stand density and exclude **Poa annua,** although disease problems may be less severe on dryer, less fertile bent fairways. Hand watering of dry areas plus soiling and seeding of divots may also be required to maintain a dense turf canopy. In all, the increased costs associated with lightweight mowing and thatch control of bentgrass fairways are likely to be offset by beneficial aspects such as reduced irrigation, fertilization, and pesticide applications. Also, many hours of aggravation and worry will be saved, and fairway quality can be maintained throughout the year.

(This column summarizes two reports — "Renovation Techniques for Establishment of Bentgrass Fairways" and "Bentgrass Fairway Management" — which were compiled after discussions with several Chicago area superintendents. These reports will be mailed to all CDGA-member superintendents, and will be available to other interested parties upon request. A small fee will be charged for out-of-state, non-CDGA members. Send requests to: Dr. R. Kane, CDGA, 619 Enterprise Drive, Suite 101, Oak Brook, IL 60521.)

Dr. Paul Sartoretto was honored at the recent GCSAA Convention in San Francisco. 1986 marks the 40th year of Dr. Sartoretto's dedicated service to the golf course industry.

W. A. Cleary Chemical Corporation, Somerset, N.J. is honoring Paul, their former technical director and president, by initiating an $8,000 scholarship, $2,000 per year, for the next four years in **Paul Sartoretto's** name. The donation is being made to the GCSAA scholarship fund.

New Golf Course Mechanics Association

With the Superintendent's profession becoming more and more refined, the role of the Golf Course Mechanic is critical in the Superintendent's efforts to achieve his goals. Has your Mechanic ever been heard to say?

—There's got to be a better way.

—I'm sure we could've gotten those parts cheaper somewhere else.

—Who do I call to get a straight answer?

Most have!

Following the recent Chicagoland Golf Course Superintendent's Association shop tour, those present felt the experiences gained were too valuable to be limited to an annual gathering. **John Maguire** echoed this sentiment and took the initiative to invite other Golf Course Mechanics to his shop. On February 11, 1986, 27 Golf Course Mechanics gathered at Sunset Ridge Country Club to form an association to discuss common goals and experiences. At this meeting the consensus was that forming an association geared to the exchange of ideas would be beneficial to the industry as a whole. The Chicagoland Golf Course Mechanic's Association was born!

Thoughts and ideas on goals for the organization were in abundance. A few goals of the CGCMA are:

- To better educate it's members.
- To become more professional.
- Finding quality parts at reasonable prices.
- Cataloging parts sources.
- Exchange seldom used specialty tools.
- Borrowing parts for emergencies.

Meetings will be held once a month on a rotating basis at various member's shops. All Golf Course Mechanics in the Chicagoland area are cordially invited to attend future meetings. Please feel free to contact any of the following for dates and places.

John Maguire - Sunset Ridge Country Club 446-5222 ext. 29
Mike Davis - Bartlett Hill Country Club 837-5270
Rod Halenza - Medinah Country Club 773-1704 ext. 277.