



Calloway Gardens Golf Club, Pine Mountain, Ga., converting 18 bermuda greens to bentgrass. Applying Siduron, bentgrass seed and topdressing.

Instant Bentgrass Greens

by **JAMES B. MONCRIEF**, Director Southern Region USGA Green Section

In this age of instant foods, instant hotel and airline reservations and — for some — instant credit, isn't it time for "instant bentgrass greens?" That day may not be as far off as some think, thanks to the efforts of Charlie Danner, superintendent of Capital City Club, Atlanta, Ga. His members may believe such a day is already here.

In 1969, Danner was first to try an innovative technique in converting bermudagrass greens to bentgrass. There was a short period of inconvenience at seeding time, but this was minimized with proper handling during conversion. The method has since been successful at Charlotte Country Club and Quail Hollow Country Club in Charlotte, N.C., where each club converted 18 greens to bentgrass.

Other clubs started similar conversion programs in September, 1971. These include 18 holes at Calloway Gardens, Pine Mountain, Ga., and Chattahoochee Country Club, Gainesville, Ga. Changing from bermudagrass to bentgrass greens at these clubs was suggested only because greens were originally built with good surface, internal, and sub-drainage.

Many pre-emergent chemicals today seem to affect some grasses more than others. One such chemical is called Siduron, and it has been found quite effective on bermudagrasses. Bermudas vary in tolerance to Siduron, but, due to its general toxicity, it is not suggested for use in the South. It has had limited sale value there.

During the mid and late '60s, much interest



A test plot area showing control of bermudagrass in bent.

was shown in Siduron as a chemical means of keeping bermudagrass out of bentgrass greens. At this time, several clubs in the South, where Seaside and Penncross bent is used, began to retard encroachment of bermudagrass into bent greens with Siduron. Since some bents are susceptible to this chemical, tests should be made before applying it to greens if you are trying to eliminate bermudagrass.

THE CAPITAL CITY STORY

Danner is believed to be the first superintendent to convert bermuda greens to bentgrass with Siduron. Danner presented the following report at the Georgia Superintendent meeting in January, 1971, and was printed in the *Georgia Turfgrass News*.¹

In 1968 my club made the decision to convert from bermudagrass to bentgrass greens, and to convert six of them in the fall of 1968. We installed six temporary greens and these were ready for play when we started the conversion work on September 10, 1968.

We approached this job in what we

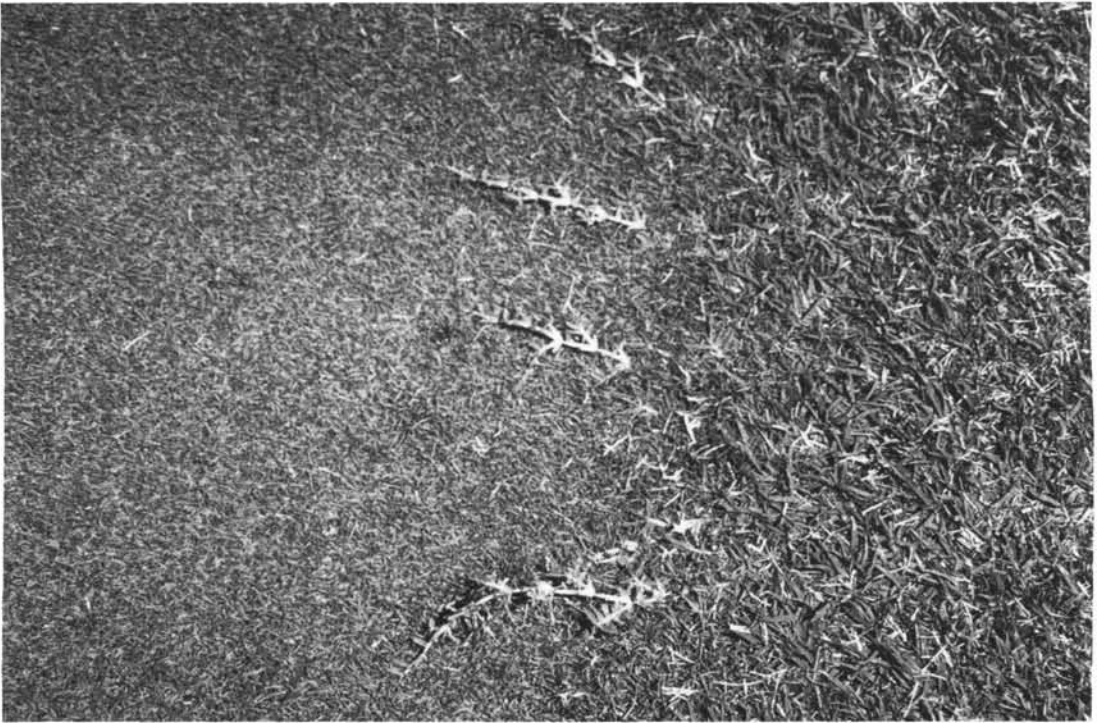
thought was the best and most foolproof way. First, we mixed soil, sand, and peat at a central mixing site. Second, we removed one inch of sod from the greens. Third, we hauled in soil from the mixing site to compensate for the sod removed. Fourth, we rototilled and then rough-smoothed the greens. Fifth, we sterilized the soil using methyl bromide and the greens were smoothed and made ready for seeding. Finally, the six greens were seeded to two pounds of Penncross bentgrass seed to each 1,000 square feet.

We were washed out twice and had to reseed. The third seeding was made by mixing the seed with Hydro-mulch, which finally held.

The six greens were out of play from September 10, 1968, to April 29, 1969. All this time we were using temporary greens, much to the distress of our golfing members, and the cost ran up to \$7,792.40.

Back in the winter, I wondered if there was some easier and better way to convert the greens from bermuda to bent, and then I remembered Tupersan (the

¹*The Georgia Turfgrass News*, 1971, Vol. 1, p.3.



Bermudagrass encroachment into a bentgrass green.

trade name for Siduron)! Some years ago the DuPont Company sent one of their field men to Capital City to put in some experimental plots of pre-emergence weed control materials. We gave him three tees and he put in a number of 5 x 10-foot plots. In one of the plots the bermudagrass was killed! When the man returned to evaluate his plots, I asked him what he used on the plot that killed the bermudagrass. He answered that it was an experimental chemical to be named Tupersan. I gave this no more thought until I began to read the magazine ads which said that Tupersan could be used on areas to be seeded to bluegrass or bentgrass. They said the chemical could be applied one day and seeding could be done the next. "I talked to Bob Miller, from DuPont, during the winter. He encouraged me to try Tupersan, but he could not advise me of the rate to use. The Company had been testing three rates; 4½ ounces, 9 ounces, and 13 ounces per 1,000 square feet, but I had to find the best rate myself. I also contacted James B. Moncrief and Holman Griffin, with the USGA Green Section. Griffin

told me about a club in Arlington, Va., that had some success in converting from bermudagrass to bentgrass using Tupersan. With this encouragement, I determined to try this method.

We had a 5,000-square foot nursery of Tifton 328 bermudagrass, and we started our experimental work here on March 28, 1969. The bermudagrass was just starting to green. We split the nursery into four sections. One section was for the 4½ ounce rate, one for the 9 ounce rate, one for the 13 ounce rate, and the last as a check with no Tupersan applied. First, we used a verti-cut and a greens mower, both machines set down to the ground. We verticut and mowed in two different directions. This removed all bermudagrass down to the ground. Second, we spiked the area in six different directions to get good penetration of the Tupersan into the soil and to make a better seed bed. Third, we applied the Tupersan to each section as outlined above. The Tupersan was washed into the soil thoroughly with about one half inch of water. Lastly, seeding was done the next day at two pounds of Penncross bentgrass seed to

each 1,000 square feet. Seed germination was good and the nursery was maintained as a green from then on.

By May 15, 1969, we could evaluate the results. Bermudagrass was present in all the plots, but in the 13-ounce plot it looked very unhealthy. We had nothing to lose so I decided to apply another application of Tupersan at 13 ounces to 1,000 square feet over all four plots to see what would happen. This was done on May 29, 1969, and the temperature was 96 degrees. By the end of summer we could find very little bermudagrass in the nursery and no living bermudagrass was left in the plot that had a total of 26 ounces applied.

I showed the results of my experimental work to my Green Chairman, and we decided to use this method to convert the remaining greens to bentgrass.

Work on the remaining 13 greens commenced on September 15, 1969. We did not want temporary greens, so we decided to work the back two-thirds of each green and to leave the front one-third for the golfers to play on. We

followed the same procedure used on the nursery; verti-cut, mow, spike, apply Tupersan, and seed. On October 15, 1969 the back two-thirds of each green far exceeded our expectations and by this time was in real good shape. We then worked the front one-third, but the weather had turned cooler. The bentgrass germinated but did not thicken until the following spring. If we had to do this over again, we would do the whole green at one time and let the golfers putt on the seed and top-dressing. We think seeding no later than September 15 to be the best time. It is best to have the newly seeded grass well established before cold weather sets in.

Seeding was performed with small cyclone spreaders. We applied one half pound of seed in one direction and cross-seeded with one half pound in the opposite direction. We top-dressed with one eighth inch of top-dressing. On top of the top-dressing we again applied one half pound of seed in one direction, and another one half pound in the opposite direction. We then power dragged in two different directions.

Common is one of the most difficult bermudas to kill.



Another application of Tupersan at 13 ounces per 1,000 square feet was made on March 23, 1970, which made a total of 26 ounces of Tupersan applied over six months.

Of course, we anxiously watched the greens to see if the bermudagrass came back. We found that on the Tifdwarf greens we obtained 100 per cent control. On the Tifton 328 greens we had a few small patches (not over 1 per cent) which did not overly concern us since we figured another application of Tupersan in October, and another in March would take care of this and also prevent encroachment into the greens. We made one application on October 19, 1970 and another in March, 1971, at 13 ounces per 1,000 square feet.

The cost of converting the 13 greens amounted to \$2,735.00. This included seed, Tupersan, and top-dressing. We estimated that we spent about \$700 more for the Tupersan and seed, primarily because of the higher cost of Penncross bentgrass seed. The big bonus was that we had no temporary greens to manage. Another bonus was that Tupersan is a real good pre-emergence chemical for crabgrass and crowfoot grass. We were not bothered by these weeds the past year.

We were pleased that we were able to convert 13 greens while keeping them in play. Also, the greens far exceeded our expectations and pleased our golfing members, which is what our job is all about.

We feel that any club with bermudagrass greens can convert to bentgrass, provided that good drainage (sub-surface, surface, and air) exists and one uses a good soil mix. This can be done at very little cost and without temporary greens, which should please the golfing members.

OTHER CASES

Quail Hollow Country Club, Charlotte, N.C., is the host to the Kemper Open, and the tournament was played on overseeded bermuda greens until 1970. In September, 1970, Superintendent Bob Mashburn vertical mowed the greens three ways and denuded them of bermudagrass as much as possible. After the debris was removed, he applied 13 ounces of Tupersan per 1,000 square feet. The chemical was watered in with a minimum of one-half-inch water. On September 29, he seeded with Penncross bentgrass seed. It took about one week before there was a noticeable effect on the bermudagrass. The chemical reacts by

causing retardation of the root system. Top-dressing made a smooth enough putting surface and the bent began to sprout and grow within a week and the putting began to improve. Play was at a minimum due to the beginning of the football season.

In April, 1971, nine ounces of Siduron per 1,000 square feet was applied and 13 ounces applied in May and again in June. During the late summer there was an occasional bermuda sprout, but the greens were free of goosegrass and crabgrass. *Poa annua* has not been a problem. The bent was mowed at one-quarter-inch after the tournament, and it has been maintained at this height throughout the summer. Pythium has been a problem, but use of a fungicide has kept it to a minimum.

From September, 1970, through May, 1971, about 12 pounds of nitrogen per 1,000 square feet in a 4-1-2 ratio has been available to the grass, and very little if any nitrogen was added during the summer. When nitrogen is applied, one or two ounces of water soluble material per 1,000 square feet is sprayed on the greens with the fungicide application.

Mashburn stated that if he had to convert his greens again, he would use this method rather than soil sterilization, requiring tedious gassing and tents. Golfers are inconvenienced very little with this method, and they are happy with the results.

Johnny Burns, Superintendent of the Charlotte Country Club, began converting his greens about the same time as Quail Hollow, and he has essentially used the same method as both Capital City and Quail Hollow. Burns has observed that Tiffine or 127 bermudagrass is quite tolerant of Tupersan, and it does not go off-color when it is applied. This emphasizes that chemicals should be checked on your grass under your conditions if there is any doubt.

TEST PLOTS ESSENTIAL

We would like to reiterate that it is advisable to put out test plots if bermuda is invading bentgrass greens to see if your strain of bent is sensitive to Tupersan. For the past three years, Tupersan has been used for retarding bermudagrass, and many greens have been rid of bermudagrass by its use. This chemical shortens the root system of bent, so caution should be used. This method is not suggested unless you have properly constructed greens for maintaining bent.

This is another case history where the turf manager has worked out techniques that have saved him time and money. There has been minimum inconvenience to members since greens have remained in play almost all the time.