

Thirty-five gallons of water per acre were used for each spray treatment. Control was very good and it appeared that very few plants matured. It was estimated that 80% control was obtained.

Supt. Dest was able to apply sodium arsenite by spraying in the early morning when temperatures were below 70°F. and by waiting for even

the slightest rainfall so that there was some soil moisture available. These are the two important requirements for using sodium arsenite . . . ample soil moisture and air temperatures below 70°F. By choosing days wisely, progress in control is possible even during the most difficult seasons as experienced in 1963 in the Northeast.

Tifgreen (Tifton 328) Bermudagrass for Golf Greens

By Glenn W. Burton*

Tifgreen is a sterile F₁ hybrid (2n=27) between a fine-textured common, *Cynodon dactylon*, selection (2n=36) from the fourth green on the Charlotte Country Club, Charlotte, N. C., and *Cynodon transvaalensis* (2n=18). It was bred and evaluated at Tifton, Georgia, and is a product of the turf research supported by the Georgia Coastal Plain Experiment Station, the U.S. Department of Agriculture, the United States Golf Association and the Southern Golf Association. Created in 1951, released in 1956, planted on hundreds of golf courses in the United States and around the world, Tifgreen has passed the test of time.

Tifgreen is a low-growing, rapidly spreading, disease-resistant hybrid that makes a dense, weed-resistant turf. Its fine, soft forest green leaves and few seedheads are largely responsible for its excellent putting qualities. It tolerates overseeding with winter grass better than most bermudas. Although it has survived the winter at Manhattan, Kansas, and Beltsville, Maryland, Tifgreen is recommended for golf greens only in the

bermudagrass belt. Its short stems bear yellowish-green heads that never shed pollen and never produce seed.

GOLF GREEN ESTABLISHMENT

1. Locate greens in full sunlight with good air movement.

2. Provide good soil drainage. Tile 18 inches below the surface overlaid with six inches of crushed rock and some 12 inches of a suitable putting green soil (perhaps a mixture of sand and topsoil) is recommended.

3. Contour the green to drain water from its surface and away from paths of heavy traffic.

4. Uniformly apply and work into the soil lime and fertilizer according to soil test. On most soils, a complete fertilizer such as an 8-8-8 applied at a rate of 20 to 25 pounds per 1,000 square feet will be adequate.

5. Fumigate soil with one pound of methyl bromide per 100 square feet under well-anchored airtight polyethylene covers for 24 to 48 hours to kill weed seeds, nematodes, and other soil-borne pests. Soil temperatures must be above 50°F. Wait 48 hours before planting except on heavy soils and in cold weather when a

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waiting period up to seven days may be required.

6. Plant pure Tifgreen bermuda-grass (certification guarantees purity) only in moist soil by setting sprigs six to 12 inches apart or broadcasting five to 15 bushels of shredded sprigs per 1,000 square feet. Planting heavier rates permits earlier play. Press sprigs into soil with disk planters or cover with about 1/4 inch of sterilized soil. Poultry wire laid on sprigs ahead of topdressing and removed afterwards helps to cover them.

7. Convert old greens by mowing close, spiking, and fumigating with methyl bromide to kill grass and weeds. Wait at least 48 hours after cover is removed. Then broadcast five to 15 bushels of shredded sprigs and cover with sterilized soil as above. If thatch on the old greens is very thick, strip sod, add sand or soil to improve texture of green soil, mix thoroughly with a rototiller, and proceed as if establishing new greens.

8. Water immediately after planting and keep moist by frequent light watering (two to three times daily) until the grass is well-rooted and growing.

9. Apply and water-in about 1-1/2 pounds of nitrogen per 1,000 square feet when grass starts growing (two or three weeks after planting) and repeat application every three to four weeks.

GOLF GREEN MAINTENANCE

1. Fertilize with 10 pounds of 14-7-7 (or a 2-1-1 ratio of fertilizer to supply same amount of nutrients) per 1,000 square feet monthly or 4-1/2 pounds of ammonium nitrate per 1,000 square feet monthly plus six pounds of 0-14-14 per 1,000 square feet quarterly. Research suggests that activated sewerage sludge or urea formaldehyde applied at 25 pounds and about four pounds, respectively

(similar rates of actual nitrogen), will give slightly better growth of turf and may be applied less frequently. Light sands may require minor elements. Lime only according to soil test recommendations to keep soil pH between 5.5 and 6.5.

2. Topdress lightly (1/4 to 1/2 cubic yard per 1,000 square feet) with weed- and nematode-free loamy sand soil once a month. Soil from a virgin wooded area far removed from cultivated fields may not require fumigation. Generally fumigate with methyl bromide under a tight polyethylene cover using one pound per two cubic yards of soil. For best results have soil under cover moist, loose, and less than one foot deep. Keep under cover for 48 hours. Wait at least two days after treatment before using. Mow greens close before applying soil and work soil topdressing into sod with a steel door mat dragged over the grass in opposite directions.

3. Water as needed to prevent wilting. Apply 1/2 to 3/4 inch each time. Do not overwater.

4. Mow (usually daily) with a sharp mower set to cut at a height of 1/4 inch. Change mowing direction and use verticut as necessary to prevent grain formation.

5. Spike or aerify only as needed to relieve soil compaction.

DISEASE CONTROL

Learn to identify diseases and the weather conditions that favor their development. **Watch continually** for early symptoms and treat for their control as recommended by Homer D. Wells in Circular N.S. 39, Georgia Coastal Plain Experiment Station, entitled "Turfgrass Diseases and Their Control."

INSECT CONTROL

Learn to identify important turf insects. The most common turf in-

sects in the South are mole crickets, sod webworms, cutworms, and army worms. **Watch continually** for the first sign of their presence and treat immediately with 2-1/2 to five pounds of chlordane dust per 1,000 square feet. Other insecticides are effective and all are poisonous. Follow directions on the container label and heed all precautions.

WEED CONTROL

An ounce of prevention is worth a pound of cure. Weed problems can be greatly reduced with proper management.

1. Sterilize the soil for the green with methyl bromide before planting.

2. Always topdress with sterilized weed-free soil.

3. Keep golf green turf healthy and dense with proper management.

4. Control weeds in fairways and roughs near greens to reduce weed seeds that might be brought in by wind, mowing equipment, carts, players' feet, etc.

5. Use chemicals where necessary as a tool to help control weeds. Generally, 2,4-D or 2,4,5-T will take out most broadleaved weeds, but Tifgreen will not tolerate more than 1/2 to 3/4 pound of these materials per acre in any one application. Disodium methyl arsonate and some closely related compounds injure bermudagrass less than most weedy grasses and may be used to help control them. Usually three to five pounds of active ingredient per acre applied two or three times at 5-to-7-day intervals is recommended.

Research is producing many new chemicals that may make current recommendations for disease, insect, and weed control out of date. Test new materials carefully on small areas before making extensive use of them.

OVERSEEDING WITH WINTER GRASS

Reduce spring transition problems

by having Tifgreen in top condition when overseeded. To do this:

1. Fertilize, aerify if needed, and topdress greens with about 1/2 yard of sterile loamy sand per 1,000 square feet one month before overseeding.

2. Raise cutting height to 5/16 inch or more (if players will permit) to increase food reserves in stolons.

3. Delay planting if possible until late October or early November to reduce disease problems. Cottony blight is inactive below 70°F.

4. Precede planting by mowing greens close—1/8 inch.

5. Uniformly overseed with 30 to 50 pounds of domestic ryegrass; or eight to 10 pounds of *Poa trivialis*; or a mixture of 10 pounds of creeping red fescue, four pounds of *Poa trivialis*, three pounds of Kentucky bluegrass, and one pound of Seaside bent per 1,000 square feet.

6. Drag seed into turf with a steel door mat. Several passes in different directions may be required.

7. Apply and drag-in 3/4 to one cubic yard of good sterilized loamy sand or other topdressing material per 1,000 square feet to cover the seed.

8. Keep moist with frequent (usually once a day) light watering as needed.

9. Start mowing at a height of 3/8 inch as soon as grass is well established. Lower cutting height to suit players' demands.

10. Maintain winter grass with regular mowing, watering, topdressing, and disease and insect control as needed.

11. Generally, Tifgreen will gradually crowd out and replace the winter grass with no noticeable transition problem if the Tifgreen is treated as outlined above. Withholding water will usually hasten the disappearance of the less drought-resistant winter grasses.