Can Drive 75DF

Eradicate Torpedograss?

Often unnoticed in fairways and roughs, torpedograss really gets noticed when it reaches greens and tees

BY PHILIP BUSEY, PH.D.

Torpedograss, *Panicum repens*, is a persistent weed on many golf courses. Now that we have a chemical product, Drive 75DF®, that selectively controls it, can we use the chemical to eradicate torpedograss from areas of the golf course?

My opinion is that it will be possible to permanently remove torpedograss from bermudagrass turf, if multiple small applications of Drive 75DF® are used in multiple successive years on the same infested areas. The label restricts the number of applications to two or three per year using no more than 2 pounds of product per acre in one year.

On golf courses, torpedograss starts from rhizomes and tubers that are carried and unintentionally planted, for the most part during construction. Seeds have not been reported in Florida. The rhizomes and tubers withstand burial and remain hidden, to later sprout new shoots through one or more feet of soil.

Torpedograss was introduced to Florida, probably in the late 1800s, with the intention that it might be a good forage plant. It did not make a good forage, but it did become widely established.

I have seen torpedograss establish from the root balls of trees in a new landscape, and I have seen it puncture up through asphalt paths. Golfers pay little attention to torpedograss. When they ask me what I am doing at one of my herbicide trials on the golf course, I show them the torpedograss in the rough and I say, "I am trying to find the best way to kill torpedograss."

Their usual response to me is, "Oh, okay. I thought that was part of the rough."

Once torpedograss is on the golf course, it spreads underneath fairways and roughs, eventually reaching greens and tees. When it reaches mitigated wetland areas, it generally overwhelms the native plants and looks unsightly around lake margins.

Trying to pull it out of the ground is useless, as the shoot will break off from the buried rhizome. In fact, almost any mechanical treatment such as disking only serves to spread torpedograss.

Modern, well-designed golf courses often have the worst problems from torpedograss, either because they were built from dredged lake bottoms, or because they were built in former pastures. Older golf courses, which have had limited movement of soil, are often relatively clean.

In 1991, University of Florida researcher Dr. Bert McCarty began to discover control or suppression of torpedograss with quinclorac. (Dr. McCarty has since moved to Clemson University, and has authored several books, such as the *Color Atlas of Turfgrass Weeds*.)

In research published in 1993, McCarty found little or no injury from quinclorac to bermudagrass turf. Considering how tough torpedograss is, and the failure of past herbicides to give selective control, Dr. McCarty's work was a major breakthrough.

Following the 1998 EPA registration, BASF Corporation published its first label for Drive 75DF® (75% quinclorac), for control or suppression of torpedograss in bermudagrass turf. Other weeds are listed, but none as notable for Florida superintendents as torpedograss.

There are a number of restrictions and application requirements on the Drive 75DF label. For example, it may not be applied to golf course greens or collars. The Florida registration was issued July 1, 1999. For the next year and a half, Drive 75DF was marketed by

Key Points

- Torpedograss is a persistent perennial weed that spreads by rhizomes and tubers.
- It can be transported mechanically in sod, tree root balls and during construction.
- Drive 75DF® marketed by BASF is an effective herbicide for the control of torpedograss in bermudagrass.
- There is an application limit of 2.0 pounds of active ingredient per acre of Drive 75DF® per year, split over a maximum of three applications.
- It appears that three years of diligent applications will be needed to eradicate torpedograss from areas on the golf course.

Torpedograss cup-cutter plug showing extensive tuber and rhizome mass. Most of the plant is below the ground.

TopPro Specialties, but following corporate reorganization, it is currently handled by BASF.

The biggest issues with Drive 75DF® are the low application rates on the label, and regrowth of torpedograss. While Dr. McCarty showed that the active ingredient quinclorac was effective in controlling torpedograss — up to 89% control through the tenth week after initial treatment — he observed only 53% control through the 19th week after initial treatment. That degree of control was at a rate of application twice the subsequently labeled rate.

According to the Drive 75DF® label, no more than two pounds of product may be applied per acre per year, and the 1998 label recommended two applications of 1 pound per acre per application. Using this 1 + 1 protocol, McCarty observed only 16% control of torpedograss, 19 weeks after initial treatment.

In my initial research on Drive 75DF®, in 1998 and 1999, tank mixtures of Drive 75DF® with Illoxan seemed to show some initial improvement of torpedograss control in replicated plots, but in the second successive year of treatments to the same plots, I observed no improvement in torpedograss control.

The Drive 75DF® label recommends that "to achieve consistent weed control, a crop oil concentrate or methylated seed oil is recommended." However, in my evaluation of six different adjuvants including MSO (methylated seed oil), I observed no improvement in torpedograss control by the use of any adjuvant, compared with no adjuvant, or even compared with watering in the Drive 75DF® after application.

Kyle Miller, BASF technical representative, has confirmed that the MSO adjuvant may be more appropriate for annual species including crabgrasses, which are also controlled with Drive 75DF®, and MSO may not be necessary for torpedograss. Miller also said that in the case of torpedograss, "root uptake is the major factor."

Considering the lack of improvement from tank mixtures or adjuvants, my next recourse was to split the annual 2 pounds of Drive 75DF® into more than two applications, with applications three weeks apart.

Theoretically, the longer that torpedograss stays suppressed, the less opportunity it will have to photosynthesize and restore its reserves. I had seen plots by BASF's Joe Mitchell, tended by golf course superintendent Arthur Kurtz, of Broken Sound West in Boca Raton. In those plots, the three-way splits looked almost clean of torpedograss.

Based on work that I started in 1999 at Palm Aire Golf Course courtesy of Fred Granger, CGCS, four applications of 0.5 pounds Drive 75DF®, at three-week intervals provided better control than three applications of 0.67 pounds, which were better than two applications of 1 pound.

In plots evaluated before treatment, and in water controls, torpedograss density was 75 to 85%. There was progressively less torpedograss in successive years of Drive 75DF® treatment, but the most dramatic improvement was in the four-way split of 0.5 pounds Drive 75DF® per acre per application, where I observed 10% torpedograss canopy.

To think of these observations in terms of relative control (reduction compared with the water treatments), the standard two applications of 1 pound per acre gave 47% reduction of torpedograss, three applications of 0.67 pounds gave 71% reduction, and four applications of 0.50 pounds gave 89% reduction. Other experimental plots at TPC at Eagle Trace, managed by Jim Moore, also showed an advantage for the three-way split, 0.67 pounds Drive 75DF® per acre per application, compared with two applications of 1 pound of Drive 75DF®.

To find out what was going on below ground, a cup cutter was used to remove two plugs from each plot, and the plugs were carefully washed and the contents separated and weighed. In the case of the water controls, 64% of the torpedograss plant dry weight was contained in the tubers, only 24% in the rhizomes and roots, and 12% in the leaf. Relative control or reduction of torpedograss leaf, rhizome, and tuber biomass was consistent with visual observations, except visual estimates slightly overestimated biomass reduction.

When evaluating torpedograss, there is eight times as much material below the surface as above the surface. Long-term torpedograss control is a long-term proposition.

The bottom line is that torpedograss consistently regrows under all conditions, but that the control from multiple small-rate applications is sufficient that there is an accumulated benefit from a year-to-year program. It appears that at least three years of diligent applications will be necessary to eradicate torpedograss from areas of the golf course. How to accomplish that will require careful record keeping and possibly some kind of GPS mapping.

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