



# Concept to active practice: frazze mowing bermudagrass makes debut

**Challenge:** Thatch/organic build-up on bermudagrass athletic fields.

**Issues challenge is causing:** Reduced durability, including plants growing vertical up through the thatch instead of laterally so it is not as strong and healthy as needed; and thatch breaking down into organic material is full of fines, creating surface compaction and slickness.

- Isolated dry spots due to inconsistent rooting
- Increased water requirement for ryegrass overseeding (seed is growing in thatch instead of in the soil)
- Decreasing ryegrass overseeding durability (seed is growing in thatch instead of soil)

**Concept solution:** Frazze mow to clean out thatch completely. Thatch management on bermudagrass is an on-going challenge

for sports field managers. Advancements in breeding to create more aggressive bermudagrass varieties create a solution for high traffic fields. But conversely, vigorous growth compounds the challenge of maintaining thatch and organic material build up.

Verticutting, core aeration, and topdressing are the accepted maintenance practices with which sports field managers address thatch and organic material build up on all grass fields (cool or warm season). According to data from the International Sports Turf Research Center, a verticutting machine with 3mm blades on 1" centers removes 11.81% of the surface area. Core aeration with 5/8" hollow tines on 2"x 2" spacing removes 7.67%. Thus ultimately verticutting and core aeration can not keep with maintaining the current thatch levels, let alone reduce the amount of thatch and

organic build up taking place on top of a bermudagrass athletic field.

## INTRODUCTION TO FRAZZE MOWING

In 1996, Ko Rodenburg decided that the practices of verticutting, core aeration, and topdressing for thatch and organic management on his Kentucky bluegrass and rye fields needed another option. As

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With overseeding and feeding the fields, the grass could regenerate quickly, nearly thatch and organic free.



▲ **Left:** Fraze mowing process **Middle:** Rhizomes exposed after rye, thatch, and organic removal **Right Top:** First mowing, 2 weeks after fraze mowing **Right Bottom:** Field 6 weeks after fraze mowing

the parks superintendent for Rotterdam, Netherlands, Rodenburg created a machine that could remove 100% of the thatch and organic build up that accumulated each season. At the same time, the machine removed the *poa annua* plants and seed accumulation while leaving the crown of the Kentucky bluegrass and rye grass for regeneration. With overseeding and feeding the fields, the grass could regenerate quickly, nearly thatch and organic free. Rodenburg's fields immediately became stronger and more durable as the re-growth of the stand was much harder than the original sword of grass. Additionally, the compaction potential at the surface was reduced because the fines from the organic build up were cleaned out and the disease pressure was nearly eliminated with the thatch removal of the thatch. Thus in 1997, fraze mowing with the KORO Field Topmaker was born.

The adaptation of fraze mowing to bermudagrass is more an introduction of the entire concept to the United States. A

practice common on fields across Europe to improve field durability and reduce *poa annua*, fraze mowing fits naturally into bermudagrass thatch and organic management. That adaptation became even more natural this year with the introduction of the Universe rotor for the KORO Field Topmaker. The Universe, designed by Imants (makers of KORO) and Campey Turf Care (of Manchester, UK), is for fraze mowing Desso sand-based natural grass fields. The 3/8" blades, aligned on four spirals, allow for Desso fields to be fraze mowed without damaging or pulling out the synthetic fibers in the sand. The small teeth do the same for bermudagrass plants, cleaning off the stolons, thatch, organic build up, and leaving the rhizomes of the bermuda exposed in order to regenerate quickly.

Allen Reid and Miles Studhalter at FC Dallas Park became the first Americans to commit to fraze mowing entire fields (frazed when referencing bermudagrass) to clean out ryegrass overseeding, thatch, and or-

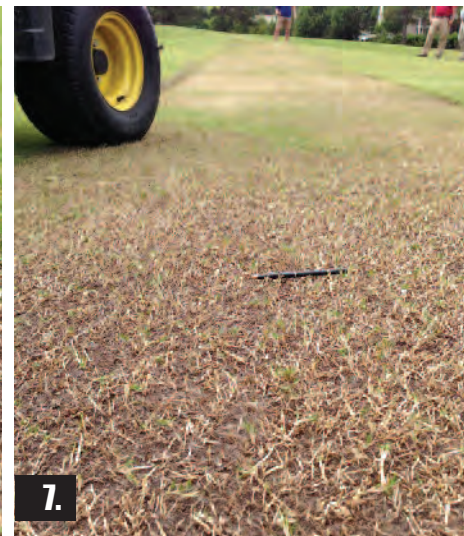
ganic build up on three fields. In mid-March, Simon Gumbril from Campey Turf Care was on hand in Dallas to oversee the process. Also, Joe Pemberton, head groundsman at Manchester United's Carrington Training Ground stopped in to FC Dallas Park to observe while in the USA on a vacation.

The 419 bermudagrass was still 95% dormant in March, but a few of the rhizomes were showing some green in the fields as they were cleaned off. See photo 1-6 for the results.

The highlight field, the FC Dallas training field, was out of play for 8 weeks, though the field was ready for play in 7 weeks. The unseasonably cold spring in the Dallas area hampered the re-growth by slowing the 419 bermuda's exit from dormancy, extending the re-generation period by approximately 2 weeks. But still, the process succeeded. According to Reid, "The first day Coach walked back on the pitch he said, 'the field feels strong.' Now after 2 months of daily training, the field has been



- 1. THATCH/ORGANIC** build-up, June 2012
- 2. THATCH/ORGANIC** build-up, July 2013 (reduced by 1 inch)
- 3. FRAZE MOWING** Patriot bermudagrass
- 4. GREEN RHIZOMES** prepared to re-generate from Celebration bermuda
- 5. GREEN RHIZOMES** exposed from fraze mowing
- 6. THATCH BUILD-UP** removed from Celebration bermudagrass
- 7. EXPOSED RHIZOMES** following clean out via fraze mowing



lightly verticut one time to stay ahead of the thatch, and is showing little to no wear.”

Fraze mowing next used when Maryland SoccerPlex Grounds staff cleaned off three fields of Patriot bermudagrass in early June. Because the fields were sprigged only 18 months ago, the processes was intended to transition out the ryegrass and promote a quicker transition to full bermudagrass instead of cleaning out years of thatch and organic build up. The Patriot bermudagrass was 30% out of dormancy when cleaned off, but within 10 days all of the exposed rhizomes were green and responding. A lack of warm weather was again an obstacle for the SoccerPlex fields, but not to the extent of Dallas. See photos 7-9 for results.

The three SoccerPlex fields that were cleaned off were 100% bermudagrass immediately. The non-fraze mowed bermudagrass fields still were only 80% bermuda (rye being the other 25%) on July 1. Additionally, the removal of only a thin layer of organic build up on top of the native soil fields now allows water to be absorbed into the soil faster. Following heavy rains, the fraze mowed fields now soaking in rain much faster than before, allow the fields to be used more.

Also in June, a golf course fairway of Celebration bermudagrass in North Carolina was fraze mowed to demonstrate the process on active, fully growing bermudagrass. The Celebration had begun to build up a thick thatch layer that needed cleaned out (see photos 10-12).

Fraze mowing is a new process to the United States turfgrass market. Yet many intuitive sports turf managers have always

► **FIELD 12** following fraze mowing compared to 5 weeks later

used similar techniques such as scalping, shallow sod cutting, and even burning off to remove thatch build-ups. Now those are brought into one practice. The process is a vastly different approach to thatch management. It is a practice is not for the faint of heart and can leave a sports turf manager questioning whether they should have done it or not for the 1st week. But ultimately, the strong grass will prevail.

Albert Einstein said it best: “If you always do what you have always done, you will always get what you have always got.” Can fraze mowing bermudagrass become an accepted practice in a regular maintenance program to advance the durability of fields for them to sustain more traffic? That is now up to the industry to decide. For more on fraze mowing bermudagrass, see Jerad Minnick’s blog, <http://GrowingGreenGrass.Net>. ■

*Jerad Minnick is sports turf manager of the Maryland SoccerPlex at the Maryland Soccer Foundation, Boyds, MD. Allen Reed is stadium groundsman for FC Dallas.*



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# Dealing with grubs: latest recommendations

**Editor's note:** We asked two noted academicians, Dr. David Shetlar, professor of entomology at Ohio State, and Dr. Benjamin McGraw, associate professor, golf & plant sciences at the State University of New York-Delhi, to update us on treating grub problems:

**SportsTurf:** How will turf managers first recognize they have a grub problem?

**Dr. Shetlar:** Most professional managers will notice that the turf under their care is not performing well or is showing signs of drought stress at times when soil moistures are okay. However, inexperienced managers miss grub populations until the birds or digging animals “show” where the grubs are! Unfortunately, by this time, the grubs are often third instars and pretty difficult to control with inexpensive products. At this time, one may have to use Dylox or Arena and ensure that immediate irrigation follows the application.

**Dr. McGraw:** Probably more often than not, most turf managers recognize they have a problem once they have some serious damage signs. Vertebrates like skunks poking around, raccoons rolling back the turf or birds pecking at the turf are all good signs of grub activity. This is more likely to be late in the fall and when grubs are fairly large and capable of causing some damage on their own (i.e., feeding on the roots of the plant).

Astute turf managers would probably cue into a general wilted-or yellowing appearance to the turf in earlier in the fall, and follow this observation up with some sort of soil probing (taking a golf course cup cutter to a section of turf and looking for the actual culprits is in my opinion a easy way to confirm grub presence). Given the workload of sports turf managers, especially those that have many schedule games and activities on fields in late summer to early fall, proactively sampling large areas with a cup cutter is probably not feasible. Restrict-

ing sampling to where grubs have been a problem in the past and in high-valued areas is a more realistic approach.

**ST:** What steps do you recommend to eradicate the problem?

**Dr. McGraw:** Preventive insecticides are still the number one go to method of control. When neonicotinoids like imidacloprid (Merit) came on the market it revolutionized how we treat for grubs. Before, turf managers had to applied harsher chemicals curatively or after the infestation had been realized. With products like imidacloprid and newer classes like the anthranilic diamides (Acelepryn), applying preventively before egg hatch leads to greater levels of control, since you are delivering a toxin to a much smaller insect (1st instar larva vs. a 3rd instar). That being said, eradication is not really possible even with chemical controls. Adult beetles are capable of travelling great distances to find your adequately watered soils to lay their eggs in. Even with great control in Year 1, some adult beetles will wander in Year 2 from neighboring sites.

**Dr. Shetlar:** Late season grub issues fall into what I call “rescue treatments.” This is an extreme form of curative treatment because the large grubs can be 30 to 40 times the body weight of the grub that hatched out of the egg! Another issue is that the grubs often stop feeding once they have achieved their maximum size for the season.

I often talk to Dan Potter in Kentucky in September and he points out that his Japanese beetle and masked chafer grubs have turned a yellow white color which in-

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— Dr. McGraw





dicates that they have made all the fat that they are going to make for the season and they've stopped feeding. During this same time, the grubs in Central Ohio are still very white and still feeding! Why is this important? While many insecticides have contact activity (absorbed through the exoskeletons), the primary mode of getting insecticides into the insects is by ingestion! In short, the closer you get to the transition zones, the earlier that annual white grubs may stop feeding for the summer/fall season.

At present, products containing trichlorfon (=Dylox) or clothianidin (=Arena and Aloft) seem to have the best chance of killing large, third-instar grubs—if they are feeding! Both products tend to kill the grubs within 3 to 5 days which will also stop any animal digging. In our field tests, the other neonicotinoids, imidacloprid (=Merit) and thiamethoxam (=Meridian) will kill third instar grubs, but they often take 10 to 14 days. I also commonly recommend spreading Milorganite fertilizer (made from human sewage sludge which no longer contains any heavy metal contaminations) over the area where animals are digging as this will chase them away for a week or so while the insecticide is doing its thing.

**ST:** What are your recommendations for preventing a future reoccurrence of grubs in the same turf?

**Dr. Shetlar:** Most of the registered grub control products (other than Duocide which contains carbaryl and bifenthrin) can be used as preventives. This generally means to apply them before egg hatch of the annual white grubs. In most of the cool-season zones, this would be applied by mid-July. In my grub efficacy chart, imidacloprid, thiamethoxam, clothianidin (the neonics) all give 90% or better control if applied in June, July into mid-August. If you move into May, imidacloprid and thiamethoxam seem to run out of effective residuals.

Of course, the new insecticide is chlorantraniliprole (=Acelepryn) which can be applied in April through early August and get excellent grub control! For sport field managers, this should be a product of choice as it also has the most benign environmental footprint. It is also the “least toxic” of the insecticides to mammals which is a plus in sport field situations!

Whether to treat or not can often be answered by the research that was done by Mike Villani when he was at Cornell (unfortunately he passed away while still a relatively young turfgrass entomologist). He surveyed lots of golf courses and lawns in New York over several years. He found out that if an area of turf had a damaging population of grubs, it was in the 80% risk level of repeating a damaging population the following year. In short, treat areas where grub damage has been previously noted.

**Dr. McGraw:** I think that, especially on sports fields, we can minimize the effects of white grub damage substantially by developing a healthy turf stand: all the things you learn in Turf 101: adequate (not excessive) nutrients and water, minimize compaction, improve drainage as much as possible, and most importantly, develop a deep and extensive root system.

A healthy stand will definitely tolerate more white grubs without showing signs of damage than a stressed stand. Also, spend a day or two scouting out and mapping infestations. Take a golf course cup cutter, regularly sample (in certain grid like patterns), break apart the core in 1/4s and visually assess whether grubs are present. Try to identify what species of grub it is by looking at the raster pattern (row of spines on their butts). But most of all: keep good records. Grubs tend to appear in the same areas year after year. Find out what it is about that area that causes them to return: adult food sources, under-watered, over-watered, shaded, full sun, turf species?

**ST:** Do you recommend using nematodes to combat grubs? Why or why not?

**Dr. McGraw:** Nematodes may provide both short and long term suppression of white grubs and definitely have a place in grub management. You need to become educated in their proper use and application though. These are living organisms and need to be handled with care. There are some major hurdles in their adoption in many areas, namely their price and the product supply chain. However, as is the case in many states like NY where we have a ban of chemical pesticides on primary school grounds and daycares, this may be one of the handful of options that a sports field manager has in controlling white grubs. I hope that their adoption is greater in the future because it is an environmentally responsible approach. However, it is a case of economics right now. There needs to be a greater interest or demand from turf managers before the market can respond to the supply issues. Only then will the price come down.

**Dr. Shetlar:** I only recommend the insect parasitic nematodes for organic lawn care and for homeowners who wish to use non-pesticide techniques. They are still relatively expensive to use and you need to arrange with the supplier to ship the nematodes at the time you are going to apply them. In short, you have to use fresh nematodes! And, when you get them, they have to be applied quickly, with lots of pre-irrigation and post-irrigation. Even with the best of applications, it has been my experience that they will fail about 25 to 40% of the time. However, when they work, they often work very well! Bottom line, they are expensive, difficult to use and the risk of failure is relatively high. ■