

Moss on The Bear
Grand Traverse Resort & Spa
Acme, Mi.
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History of Moss on The Bear

- ◆ First moss was seen on the greens on The Bear in 1989
- ◆ 18 green was the first green that had it
- ◆ #2 and #5 greens had moss on them by early 1990's

Greens are Penneagle bent and poa mix
80/20 Sand and Peat soil, USGA specs
Golf course opened in 1985

Moss first appeared in common hand water areas, (humps)

- ◆ Height of cut was at 5/32, (.156") in the 1980's
- ◆ Height of cut has been at .141" or below since the early 1990's
- ◆ Last mercury-based fungicide was applied in 1993. Calo-Clor

First treatments to control moss started in 1998 with various Dawn dish soap products
Dawn dish soap had minimal effect for up to two weeks then would come back

Moss treatments with the Dawn seemed futile, so no treatments were made in 2001

The moss persisted and became more prevalent

- ◆ Heavy infested areas were removed in the fall of 2001 then sodded.
- ◆ About 1,200 sq. ft. was sodded, on 3 different greens in October of 2001 in high-density areas.
- ◆ Another 3,000 to 4,000 two and three inch plugs were also done in the late fall of 2001
- ◆ Sodding out the moss was effective, but we did not have enough sod and could not keep up with the increasing moss population.
- ◆ Deciding where the outline of the patch should be became quite a chore.

Terracyte treatments began in the spring of 2002

- ◆ First application of Terracyte was in late April of 2002
- ◆ 10 lbs./m² on a 1,000 sq. ft. plot on the chipping green
- ◆ Four days in a row at the 10 lb./m² rate
- ◆ Follow up treatments with Zeritol at ?m² 10 days later and every 30 days after that.
- ◆ There was no moss in that first plot for the entire year of 2002
- ◆ The question is, how much was there before we treated it?

Another plot was treated on the chipping green in July of 2002. This time we treated a spot with quite a bit of moss.

- ◆ Terracyte treatments were at 12 lbs./m²
- ◆ Three days in succession at this rate
- ◆ Zeritol treatments at? 10 days after last application and twice more at 30 day intervals
- ◆ Positive results controlling most moss but not quite all of it.

In June of 2002, five individual moss spots were treated with straight baking soda.

- ◆ Dump a little bit on and smear it with your finger so the entire moss spot is covered
- ◆ This killed the moss within two days on all five treated spots
- ◆ After about four weeks the spot decayed and left a hole about _“ deep
- ◆ These spots never came back

As the moss infestation worsened on the regulation greens, we took the Terracyte treatments to the golf course.

- ◆ Late August of 2002, a total of 7,000 sq. ft. on four different greens were treated.
- ◆ 8 lbs. Terracyte per 1,000 sq. ft.
- ◆ After the second day of treatment, moss was showing signs of discoloration. Unfortunately, so was the turf.
- ◆ As day three and day four went on, the moss became quite affected by the Terracyte treatments and so did the bentgrass.
- ◆ The worse of the bentgrass discoloration was from the fourth day of Terracyte applications until about 8-10 days after the last application.
- ◆ 14 days after the last application, the bentgrass retained its color and the moss was showing extreme discomfort.
- ◆ Once again, most moss was affected while a small percentage of it was not.

In late September of 2002, we treated another section of the same greens with more Terracyte at the 8 lb/m² rate and a smaller section on one of the greens for a fifth consecutive day.

- ◆ Similar results as the August application
- ◆ Except this time the Poa seemed to be discolored more than the bent.
- ◆ Especially in the area that was treated a fifth consecutive day.

In September of 2002, two whole greens not treated with Terracyte were treated with Thiram at?/m²., three consecutive weeks at 7 day intervals.

- ◆ This treatment showed very little effect on the moss
- ◆ In May of 2003, the bentgrass on these greens did show symptoms of phytotoxicity?
- ◆ The greens treated the previous fall with Thiram, were the only two greens showing these symptoms of the entire 54 holes on property.

Other treatments experimented with in 2002

- ◆ Straight table salt had no effect on the moss
- ◆ Straight table sugar had no effect on the moss
- ◆ Timsen at ?m² had some effect but not enough
- ◆ Burning the moss with a propane torch worked but is pretty labor intensive.
- ◆ Spot treatment with Roundup left moss unaffected but killed surrounding bentgrass.

Four different treatment types were done in 2003.

- ◆ Terracyte was used at the 8-lb./m² rates on many different greens on all three courses.
- ◆ Some treatments were done two days in a row and repeated ten days later. These seemed to work quite well
- ◆ Other treatments were done three days in succession and not repeated. These were also quite successful
- ◆ Terracyte treatments were done in May, July, August, September and October
- ◆ July and August treatments were most successful
- ◆ Treated the entire green so turf discoloration was not as noticeable to guests.

Baking soda treatments were either spot applications with a shaker or dilution in a spray tank.

- ◆ All spray dilutions were in two gallons of water to treat 1,000 sq. ft.
- ◆ In August 2003, four different rate of baking soda were sprayed
- ◆ 6 oz., 8 oz., 10 oz., 12 oz.
- ◆ Three treatments were made at each of these rates in a heavily moss infested area, at 7 day intervals
- ◆ The 10 oz., and 12 oz., had some effect on the moss but not enough to be happy about.
- ◆ After the second application, the 12 oz., rate, showed better but also discolored the bentgrass.

Straight Mancozeb at 6 oz./m² was used for algae and also showed to affect the moss.

- ◆ Discolored moss slightly
- ◆ Moss returned in same areas after extremely wet fall

Chlorothalanyl, Mancozeb and Thiram combination

- ◆ 4 oz., of each product in one gallon of water per 1,000 sq. ft.
- ◆ Treated two different practice greens
- ◆ Applied 2X rate on one half of each green
- ◆ Two applications at 7 day intervals in late August
- ◆ Moss was effected, but not to desirable levels
- ◆ Treated on same green as Baking soda was sprayed.
- ◆ The combination seemed to work well, especially where the 12 oz. Rate of baking soda had been applied.
- ◆ Extremely wet fall helped moss to return.

Moss on The Bear Summary

- ◆ Sodding removes the moss and leaves you with good turf, except seems and minor areas that are not level
- ◆ Baking soda works the best to kill the moss but leaves dead area where moss was.
- ◆ Too much baking soda will also kill the grass.
- ◆ Terracyte at different rates and different times of year has various effects on the moss and the grass. Once again, there is a dead spot where the moss was. Discoloration of the turf with Terracyte is hard to swallow but will come back in two weeks time.
- ◆ Terracyte in the warmer months, (July & August), seemed to work the best.

Of all our treated areas with Terracyte, we now only have about 20%-30% of the moss we once had.

After about one season, many of the dead moss areas have filled in.

Other thoughts:

- ◆ Surface water, moss started in the hand water areas then spread.
- ◆ Are you getting the amount of time you want from your irrigation heads?
- ◆ Do too many heads hit the same areas? I noticed a few other greens on our property and other property where this is probably the case.
- ◆ Will wetting agents help wick water away from the surface?
- ◆ Running multiple heads at one time have flooded one area that has quite a bit of moss on the front center of one of our greens
- ◆ Will more frequent iron applications help control moss?
- ◆ We have reduced the wetting agents and iron, and the moss has increased

If you have moss on your greens you must do something about it. The moss will not go away by itself. Experiment with care, and let your boss and customers know what is going on.