

SPEED SPRAYER™

AIRBOOM TURF SPRAYER SYSTEM

Patent Pending

2016 DMI Speed Sprayer Report

Michigan State University

Thomas A. Nikolai, Ph.D. and Aaron Hathaway

This report summarizes the 2016 DMI vs. Toro Sprayers trial performed at the Hancock Turfgrass Research Center at MSU.

MATERIALS AND METHODS

The DMI Speed Sprayer and the Toro Multipro 1250 outfitted with TeeJet AIC (air induction) 11010 nozzles. The Speed Sprayer delivered a spray volume application rate of 28 GPA (gallons per acre) and the Toro Multipro was used delivering a typical 50 GPA. Only a portion of each sprayer was used so plots would be made smaller. Speed Sprayer plots were 10 x 13 feet and Toro plots were 10 x 6 feet. The trial area was a 80% creeping bentgrass and 20% annual bluegrass putting green. On the application date (September 6, 2016), there was small amounts of dollar spot legions in the trial area. Weather was becoming conducive for dollar spot infection growth during this period and to make sure plenty of dollar spot would infect the turf in the trial area, a 3-foot width strip across the entire trial area was inoculated with the dollar spot pathogen leaving. So, on September 6, 2016, a 3-foot width of every plot was inoculated with the dollar spot pathogen, which left a 7-foot width of each plot, length-wise, that was left un-inoculated. Three hours after inoculation, on the same day, treatments were applied with the two different sprayers. The treatments consisted of a full rate (3 fl oz/M) and a 1/3-rate (1 fl oz/M) of Daconil Weatherstik. Uniform and complete coverage is of chief importance with a protectant fungicide like Daconil Weatherstik, which was a good fit in this trial. Daconil Weatherstik will not kill the dollar spot infection, but will protect the plant from being infected by the pathogen as long as it is present on the plant and as long as the entire turf stand of leaves and stems are covered uniformly. The treatment list is presented in Table 1.

Dollar spot disease was measured on a scale from 1-9, where 1= no disease and 9= 100% covered by dollar spot legions. The inoculated portions of each plot were measured separately from the un-inoculated portions on most evaluations and, periodically, the dollar spot pressure was evaluated in the entire plots at once.

RESULTS

Where inoculated, dollar spot legions covered almost the entire plot on October 4 in all treatments except for the Speed Spray + Daconil Full. The area that was not inoculated with the pathogen did not develop too much more dollar spot infection than that which was already present on September 6. So, discussion of the results will focus on the treatment effects in the inoculated areas only. The 1/3 rate of Daconil Weatherstik only provided significantly less dollar spot incidence early, on September 21 (15 days after treatment [DAT]), when dollar spot pressure was relatively low, but it was only achieved when applied with the Speed Sprayer (Table 2). After this date, dollar spot was statistically significantly decreased by only one treatment on the other two evaluation dates: with the Speed Sprayer applying the full rate of Daconil Weatherstik. On these same dates, the Toro Multipro, even

while applying a higher water volume which should increase plant coverage on its own (although the nozzles were also different which could certainly affect spray coverage as well), applying a full rate of Daconil Weatherstik, did not provide any dollar spot control relative to the untreated plots.

CONCLUSIONS

This trial compared the Speed Sprayer technology to the commonly used Toro Multipro sprayer (on golf course greens). However, the nozzles on the Toro sprayer could have been improved to provide better spray coverage. It would also be worthwhile to try to match the spray volume application rates or look specifically at differing spray volume application rates with each sprayer. Even so, it is evident that the Speed Sprayer provided superior control of dollar spot in the inoculated plots. The inoculated plots were almost completely covered in dollar spot lesions by October, which showcased the Speed Sprayer ability to provide at least some control even when dollar spot pressure is unnaturally high. It is certainly worth looking further into the potential benefits of using the Speed Sprayer in golf course settings and especially for application of fungicides that depend on uniform and complete coverage of the turf stand for adequate disease control.

It has been a pleasure working with DMI in 2016. We look forward to any opportunities to cooperate with you in the future. Your support of the MSU Turfgrass program is greatly appreciated. Please feel free to contact us if we can be of any assistance.

Table 1: Treatment List

Treatment*	
1	Speed Sprayer Daconil Full**
2	Speed Sprayer Daconil 1/3
3	Toro Multipro Daconil Full
4	Toro Multipro Daconil 1/3
5	Untreated

* Speed Sprayer: applied a water volume of 28 gallons per acre; Toro: applied a water volume of 50 gallons per acre.

** Full and 1/3 rates of Daconil Weatherstik were 3 and 1 fl oz/M, respectively

Table 2: Dollar Spot Incidence

Treatment	September 14 8 DAT entire plot	September 26 20 DAT un-inoculated	October 4 28 DAT	September 21 15 DAT	September 26 20 DAT inoculated	October 4 28 DAT	
dollar spot incidence (1-9)							
1	Speed Sprayer Daconil Full	2.2	2.8	3.2	2.2 c [†]	4.3 b	6.0 b
2	Speed Sprayer Daconil 1/3	2.2	2.8	2.8	3.7 b	7.7 a	7.7 a
3	Toro Multipro Daconil Full	1.7	2.3	2.8	3.3 b	7.3 a	7.7 a
4	Toro Multipro Daconil 1/3	1.8	2.3	2.7	4.5 a	7.8 a	8.0 a
5	Untreated	2.5	2.8	3.3	4.7 a	7.7 a	8.0 a
LSD ($p \leq 0.05$)		NS	NS	NS	0.82	0.68	0.73

† Mean in the same column with the same letters do not significantly differ ($p \leq 0.05$, LSD).

NS indicates not significant.