

What's with Your Nozzle?



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When developing a disease management program, a lot of time is given to fungicide selection. Likewise in setting up a sprayer an effort is made to make sure that it is calibrated correctly and everything is functioning properly. You probably even spend time making sure if any nozzles are clogged. But, how much time is spent in evaluating different nozzles on the efficacy of control? Over the past couple of years we have evaluated five different nozzles for their efficacy on dollar spot control. What we found out might shock you or please you, based on your current selection of nozzles.

The current trend in the industry is to switch to larger droplet, less drift style nozzles. But is this what is best for turfgrass disease control? You have to consider what the nozzles were developed for. Most nozzles in the turf industry have come to us from the agricultural market. In the agricultural market a majority of the applications are made for weed control. In the turf market there is very little applications of herbicides; a majority of the applications are for fungicides. Even comparing nozzles in a TeeJet® catalog you find that there are very few nozzles that provide excellent control for contact fungicides; however most of the commonly used nozzles provide excellent control with systemic fungicides. Our research will put forward some discrepancies.

The Study

In the summer of 2001 and 2002 studies were conducted comparing five different nozzles: XR TeeJet®, TwinJet®, Turbo TeeJet®, Turbo FloodJet® (Spraying Systems Co.®, Wheaton, IL 60189) and the RA Raindrop® (Delavan Spray

Technologies, Widnes, UK WA8 0RJ). Each nozzle was evaluated using six different fungicides (two different chemicals from each of the three topical modes of action for fungicides) for the control of dollar spot. The contact fungicides used were Daconil Ultrex and Spotrete. Chipco 26 GT and Curalan were used for the local penetrant mode of action. Bayleton and Banner Maxx were evaluated as the acropetal systemics. All treatments were applied

to a 'Penncross' green maintained at 0.156" prior to disease development. Percent damage caused by dollar spot was evaluated several times annually.

The Results

In both years of the study no statistical differences were observed for the contact mode of action fungicides. This was a surprise as the hypothesis of the study was that contact fungicides would be most



Figure 1. Comparison of nozzle spray pattern using water sensitive paper. The yellow is the original color of the paper and the blue is where the spray pattern landed on the paper.

affected by nozzle type, or more specifically, droplet size.

The local penetrants did show significant differences during the summer of 2001, but only trends were observed in 2002. With these fungicides the finer droplet size nozzles tended to perform the best. While the FloodJet® and RA Raindrop® nozzles which produce larger droplet sizes tended to provide less control of dollar spot.

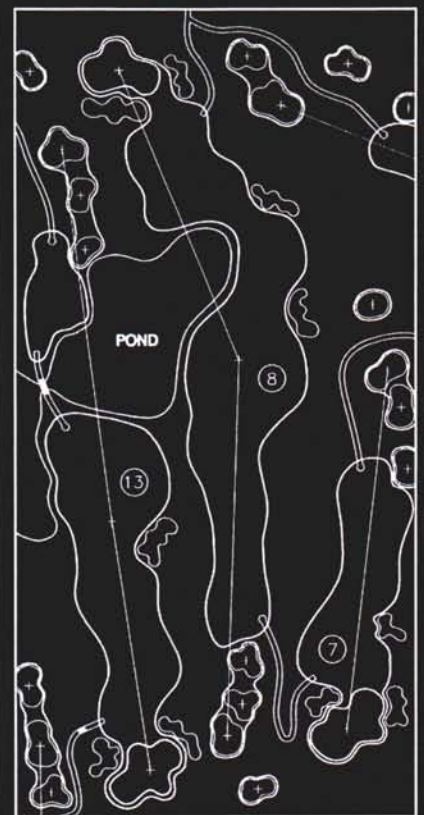
The chemicals that were most affected by nozzle type were the acropetal systemics. Similar to the local penetrants droplet size seemed to be the most influential. In general the nozzles were separated in two groups, with all the Spraying Systems nozzles having better performance than the RA Raindrop® nozzle. This is evident in figure 1 where the spray pattern of all of the nozzles has been com-

pared using water sensitive paper.

Summary

When selecting nozzles for disease control in turf it is best to select nozzles based on spray droplet size. Many nozzle catalogs will provide comparison charts or nozzle droplet size produced by nozzles that they produce. Most of the nozzles used in the study produced medium to coarse sized droplets. The FloodJet and the RA Raindrop have an extremely coarse droplet size and probably are not ideal for turf disease control. While drift should always be a consideration, fungicides would have reduced consequences in comparison to herbicides if some drift occurs. Nozzles that have medium to coarse droplet size should provide excellent disease control and limit drift. ☘

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Table 1. Mean number of dollar spot infection centers per plot ratings.

	8-6-01	8-17-01	8-1-02	8-17-02	9-5-02
Contact Fungicides					
XR TeeJet	138.8	45.5	4.3	6.3	7.1
TwinJet	89	30	4.3	5.9	5.9
Turbo TeeJet	151.1	44.6	5.3	5.8	6.3
Turbo FloodJet	121.9	45.1	3.9	5.4	6.5
RA Raindrop	92.9	46.8	5.6	10.3	9.9
LSD (P=0.05)*	NS	NS	NS	NS	NS
Local Penetrant Fungicides					
XR TeeJet	12.9	23.9	0.3	0.5	1.4
TwinJet	16.3	26.9	0.1	0	0.5
Turbo TeeJet	17.1	28.4	0.3	0	0.8
Turbo FloodJet	23.9	40.6	0.3	0.8	1
RA Raindrop	57.1	67.6	1.5	1.8	2
LSD (P=0.05)*	15.0	16.6	NS	NS	NS
Acropetal Systemic Fungicides					
XR TeeJet	21.4	4.9	0.1	0.3	0.4
TwinJet	43.6	4.5	0.1	0.5	0
Turbo TeeJet	39.8	4.9	0.4	0.8	0
Turbo FloodJet	45.5	9.6	0.3	0.5	0.3
RA Raindrop	75	12.5	1	2	0.4
LSD (P=0.05)*	21.4	6.2	0.6	1.0	NS

*NS = No significant difference amongst treatments