

# Sprayer Calibration

By LUKE DANT  
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In many cases we spend hours and days evaluating the cost and performance of products that protect our turf, but lack the same time commitment in their application. A precise application can mean the difference between a product working or failing, or obtaining 17 days versus 21 days of control. Here are six aspects of spraying that are often overlooked and can sometimes reduce the effectiveness of the products you use.

## Sprayer Calibration

This is redundant, but worth repeating. All sprayers should be calibrated at least once per year. Now, before any applications are made, is the best time to do so. This is also a good time to identify any leaks or mechanical issues that your sprayer may have prior to your first application.

It has become very common in the last 15 years or so for sprayers to come equipped with electronic spray controllers or monitors. These are great tools, but do not take the place of a regular sprayer calibration and a well-trained applicator.



Calibrating your controller or monitor is also an opportunity for you or the individual that operates the sprayer take out the instruction manual and become better acquainted with all of its features. I find that, in most cases, we do not use all of the tools these devices have to offer.

Know the product you are spraying and where you want its final resting place to be.


This discussion can pertain to all products we apply through a sprayer, but most notably applies to fungicides.

Fungicides are often divided into four categories based on their topical mode of action. These categories are contact, local penetrant, acropetal penetrant (xylem-mobile), systemic (phloem-mobile). The key is to understand which category the fungicide or fungicides you are spraying fit into and make appropriate changes to your nozzles and carrier volume to maximize performance. Simply put, contact and local penetrant fungicides require excellent plant coverage to perform at the highest level. Therefore, nozzle selection is very important, with water volume being less of a concern. In contrast, acropetal penetrant and systemic fungicides perform the best when applied near the crown of the plant where uptake is the greatest. With these fungicides, nozzles affect performance to a lesser degree, but a higher water volume is required to insure that spray droplets penetrate the turf canopy.

The final location of the spray solution is controlled by three factors: nozzle pattern, nozzle pressure and water volume. Of these factors, water volume is the one that has the greatest impact. Turf pathologists have found that higher water volumes (4 gallons per 1000 sq. ft.) improve fungicide performance when applied to control root pathogens such as take-all patch or summer patch. In contrast, fungicides applied for the control of foliar disease perform best at 1-2 gallons per 1,000 sq. ft. Evaluate the

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GROUP 3 12 M FUNGICIDES PULL HERE TO OPEN ▶

  
**Instrata™**

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**Active Ingredient:**

Chlorothalonil (tetrachloroisophthalonitrile) (CAS No. 1897-45-6) .....	29.9%
Propiconazole (CAS No. 60207-90-1) .....	4.7%
Fludioxonil (CAS No. 131341-86-1) .....	1.2%

**Other Ingredients:** 64.2%

**Total:** 100.0%

Contains 0.121 pounds fludioxonil per gallon (14.52 grams per liter)  
Contains 0.47 pounds propiconazole per gallon (56.87 grams per liter)  
Contains 3.0 pounds chlorothalonil per gallon (361.79 grams per liter)

**KEEP OUT OF REACH OF CHILDREN.  
CAUTION**

See additional precautionary statements and directions for use inside booklet.

EPA Reg. No. 100-1231  
EPA Est. No. 100-NE-001  
SCP 1231A-L1A 1105

**2.5 gallons**  
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water volume you are using and see if it is practical to make any changes to some targeted applications that you make. We often use overhead irrigation to move fungicides to their location of activity. This is often the case when preventing fairy ring, take-all patch and summer patch. The effect of post-application irrigation on the performances of fungicides is not well understood. Consider that 0.1 inches of overhead irrigation is equal to 62.3 gallons of water per 1000 sq. ft.! The question then becomes to what degree are we watering-in fungicides in? To further complicate the issue, some individuals will recommend wetting the leaf blade before the application and watering-in the fungicide immediately after application, while others will suggest to water-in the application the same night as the application. My best advice is to discuss this with the product manufacture.

### Conducting a pre-mixing sprayer evaluation

This consists of filling the tank half-full with clean water and running the sprayer as if you were spraying with an individual behind the sprayer to evaluate its performance. Listed below are reasons why this is worth the effort:

- 1) Identify nozzles that are clogged or that need replacing.
- 2) Fix misaligned nozzles or incorrectly spaced nozzles.
- 3) Determine if you have a leak somewhere in the spray system.
- 4) Identify mechanical issues before you put a product in your spray tank.

Of these four, the last one is the most important. Remember that depending on what products you are mixing and for how large of an area, you may have upwards of \$1,500 in products in an individual spray tank. Transferring a mixed spray solution out of a faulty sprayer and hoping that everything remains in suspension is not a great situation for anyone to be in.

### Tank-mixing products to avoid compatibility issues and performance issues

In our industry, it is very common to mix up some fantastic "brews", often containing five or more products. Although formulations have become better with time, there still is the need to follow proper procedure to avoid incompatibility. The acronym often used to remember the correct order-of-mixing is W-A-L-E. I have described each step below:

W - water soluble packets (WSP), wettable powder (WP), water-dispersible granular (WDG), dry flowable (DF)

A - agitate while mixing, allowing each product to mix before adding a new one

L - liquid (L), flowable (F), suspension concentrate (SC)

E - emulsifiable concentrate (EC), microemulsion concentrate (MEC)

If you are mixing products that you do not have prior experience with, a jar test is always a good idea. Jar tests are less frustrating and much less costly than a full spray tank of material that cannot be

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sprayed! Your distributor and manufacturer representative can be a great source for information about tank-mix compatibility.

In many cases physical compatibility is not an issue with tank-mixes, but one product can negatively affect the performance of another. For example, Daconil and Meridian (a white grub insecticide) are physically compatible, however; the WeatherStik found in Daconil will "stick" the active ingredient found in Meridian to the leaf surface and render it inactive.

There are also certain products that when used alone have a good turf safety, but when applied together can become phytotoxic. Once again, your distributor and manufacturer representative can be a great source of information to help you avoid any potential issues

### Recordkeeping

We, maybe better than any other agricultural industry, keep great records. However, we often miss a couple of key pieces of information that can be useful.

First, nearly all products that we apply have a lot or batch number printed on the container. These should be recorded with each application for each product. Why? In the case that there is an issue with how the product performs, most manufacturers will ask you for this information and often

*"Use this spring to take a look at your current practices and see if there is a way you can make some applications perform better this year."*

the manufacturer will store a small amount of each batch so that it can be tested for integrity should there be a performance issue.

Second, record which green, tee or fairway was sprayed first with each tank, and which fairway was sprayed last with each tank. The order of how areas were sprayed is important in evaluating product performance or non-performance. It allows you to estimate about what time a given area was sprayed in reference to weather events such as high temperature

or a surprise rainfall. It may also help you remedy a situation in which one spray tank was improperly mixed and a product was over- or under-applied. Lastly, it may assist in evaluating a sprayer mechanical problem or an issue with the applicator(s).

### Before you make your first pass

One of the most common mistakes that even veteran applicators make is to begin their first pass on the surface that they are intending to protect. As you may know, for the first 5-10 seconds each application, the sprayer is cleaning out rinsate from the last spray or blowing out air that might be in the lines. Remind yourself and your applicators to make a short pass in an inconspicuous area to move the spray solution from the back into the nozzles. Nothing is worse than to have made an otherwise perfect application, only to find out a couple weeks later that nothing was sprayed for the first 20 feet of your first pass!

Use this spring to take a look at your current practices and see if there is a way you can make some applications perform better this year.

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