

WHO CALIBRATES YOUR SPRAYER?

Last summer, researchers visited 53 of the 60 golf courses of the Nebraska golf Course Superintendent's Association (NGCSA) and found that only one of the six were accurately applying pesticides.

Their calibration accuracy study showed that only 17 percent of the courses applied pesticide carrier volumes within five percent of their intended amount (though this number may be conservative because possible tank mixing errors were excluded [Spray equipment not delivering within five percent of the desired pesticide carrier volume should be adjusted and recalibrated according to the **Guide for Private and Commercial Applicators.**])

How bad was it?

The average applicator error was 26 percent. However, the magnitude of errors ranged from a mere 0.1 percent to an alarming 177 percent over application.

Cooperators who over-applied did so by an average of 19 percent. For a quick estimation of over applied costs, assume an average preventive rate of Daconil 2787 at 4 oz. per 1,000 square feet was used (Daconil 2787 was the most frequently used pesticide among the study's cooperators at an average of \$37 a gallon).

Correctly applied, the cost of Daconil would be \$1.16 per 1,000 sq. ft. However, using the average over-application error of 19 percent the cost of application would be an additional \$0.21 per 1,000 sq. ft. These costs escalate when considering the total treated area with multiple treatments throughout the season.

In many turf programs, pesticides are key elements in management programs, but are useful only if applied according to label directions. If not properly used, pesticides may become our worst nightmare rather than a proven management tool as we begin the 1990's.

Over application may also cause turf damage, excessive pesticide residue, increased potential human exposure and water contamination through surface run-off and percolation - Another costly venture.

Golf courses are unique in the fact that they are often positioned near residential areas with a body of water nearby, and are designed to attract people for entertainment. This makes awareness and accuracy of pesticide application even more important.

Those who under applied pesticides did so by an average of 34 percent. This can be just as costly as over application. Under application may require additional applications, which increase pesticide, fuel and labor costs.

In addition to quantity of pesticide applied, sprayer performance was evaluated on the quality of pesticide application. Quality of application refers to the consistency of nozzle discharge across the boom. This was determined by measuring discharge measurements from each nozzle along the boom.

Eight-four percent of the cooperators were within guidelines. This suggest that cooperators are maintaining nozzles appropriately. If two or more nozzles were discharging more than 10 percent above the discharge average, operators were advised to replace them all.

Frequency of calibration was closely, associated with application accuracy. Two-thirds of the applicators who calibrated before each spray operation were within the 5 percent application error criteria. Comparatively, only five percent of those who calibrated less than once per year were within 5 percent. More than one-third of the cooperators calibrated less than once a year.

CALIBRATION METHODS

The "known area" calibration procedure was the most common procedure used on golf course. However, only 14 percent of the superintendents employing this procedure were considered accurate applicators.

The most accurate cooperators were those who used spray monitor and controller systems. Sixty-seven percent of these applicators were accurate.

The most common application equipment used on Nebraska golf courses were Cushman Trucksters equipped with Broyhill sprayers, centrifugal pumps and fan nozzle tips. A common problem among sprayers in the study involved pressure gauges showing a system pressure different than the actual nozzle pressure.

Random inspections of pressure consistency among sprayer systems found difference as large as 30 psi. The most probable cause for most of these pressure differences were faulty gauges. Many gauges showed signs of corrosion, had broken crystals, or had a measuring range too large to accurately measure typical operating pressure.

NOZZLE PROBLEMS

Restrictive plumbing systems, which included excessive lengths, inadequately sized and kinked hoses, improper screen sizing and anti-drip devises, were other faults leading to reduced pressure at nozzles.

Educational programs focusing on pesticide application accuracy should continue to address safety concerns for both the applicator and the environment. These programs need to educate applicators to calibrate their equipment and explain why calibration should be mandatory for any individual who deals with pesticide applicators. Applicators need to be certified for their own safety, the safety of their clientele, the general public and the environment.

Applicators should learn to use one or two calibration procedures consistently to assure regular pesticide application accuracy. Procedures should include measuring and adjusting system pressure, ground speed and nozzle discharge. These procedures should be used before each spray operation. Equipment failure and changing sprayer operations warrant this routine.

Sprayer discharge capacities and pressure gauges should be tested for adequacy and accuracy. Pressure gauges should either be replaced or tested at least once per year.

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