Equipment Calibration – Boom Sprayer

Importance of Calibration

- Properly calibrated equipment affords applicators significant value including:
  - Effective product performance
  - Reduced potential for plant injury
  - Reduction in callback/cancellations
  - Enhanced reputation
  - Environmental stewardship
  - Regulatory compliance
  - Reduction in legal vulnerability
  - Economic efficiency

Importance of Calibration

- Case Study #1
  - 23.5 gallons of Dimension® 2EW covers 125 acres
    - Cost of product at correct rate $6,110
  - Over apply product by 15% (**)
    - 2 GPM = 38 oz/M
    - New rate of 27 gallons (3.5 gal more)
    - Cost for product is now $7,020
      - $910 excess cost

(**) – A 15% over/under application rate is not unreasonable considering that there can be a ¼ - ¾ GPM variation depending on age of sprayer, application speed, etc.

Importance of Calibration

- Case Study #2
  - 23.5 gallons of Dimension® 2EW covers 125 acres
    - Cost of product at correct rate $6,110
  - Under apply product by 15% (**)
    - 2 GPM = 38 oz/M
    - New Rate of 20 gallons (3.5 gal less)
    - Cost for product is now $5,200
      - Savings of $910

(**) – A 15% over/under application rate is not unreasonable considering that there can be a ¼ - ¾ GPM variation depending on age of sprayer, application speed, etc.

Importance of Calibration

- Case Study #2 (cont.)
  - Excessive crabgrass breakthrough
    - 37-½ acres (30% of total acreage)
    - Apply LESCO® Momentum Q™ (¥)
      - 8 pints/acre
      - Example: Cost of $5,250
  - Total cost is now $10,450
    - $5,200 + $5,250
    - Excess cost of $4,340 (over correct rate)
      - Doesn't include additional labor & vehicle expenses

(¥) – LESCO® Momentum Q™ controls over 200 broadleaf weeds including dandelions and clover plus grassy weeds like crabgrass and foxtail all with one application.

Tools Needed for Calibration

- Calibrated 5 gallon bucket (gallon increments)
- Calibrated 1 gal. pitcher (ounce increments)
- Stop Watch
- Turf marking paint or marking flags
- Measuring wheel
- Calculator

Boom Sprayer Calibration

- Step #1a – Determine Effective Spray Swath
  - Fill spray tank with 50 gallons of water (no chemicals)
  - On a paved surface spray in a line
  - Measure the effective spray swath

Boom Sprayer Calibration

- Step #1b – Determine Travel Distance
  - Divide 1,000 sq. ft. by spray swath (from 1a)
  - Result is travel distance
    - Example: 1,000 ÷ 10 = 100 ft.
  - Mark a start and finish lines of this distance with cones, turf paint, or marking flags

Boom Sprayer Calibration

- Step #2a – Determine Application Time
  - Make an application of water in this marked off area with stop watch
    - Ensure the speed you plan to use during applications is used
      - If vehicle travels slower or faster calibration will not be accurate
    - Start 20’ before starting line to ensure full application speed is achieved

Boom Sprayer Calibration

- Step #3 – Collect Output
  - Using time determined from above, use 1 gallon calibrated pitcher to catch water sprayed out by nozzles
    - You will need to do this for each nozzle
    - This will determine the amount of water being applied per 1,000 sq. ft.
  - Add up amount collected from each nozzle
    - Each of the 4 nozzles spray .25 gallons
    - 32 + 32 + 32 + 32 = 128 oz (1 Gallon per 1,000 sq. ft.)

Boom Sprayer Calibration

- This is a good time to check for nozzle issues
  - Take the total amount of water and divide by number of nozzles (result is average output per nozzle)
    - Example: 128 ÷ 4 = 32 oz.
  - If nozzle variance is 10% or more (up or down) than the average output check nozzles & screens for debris and replace as needed
  - You will need to rerun Step 3

Boom Sprayer Calibration

- Step #4 – Tank Coverage
  - Divide the total tank capacity in gallons of the spray tank by the amount of water sprayed per 1,000 sq. ft.
    - Example: 200 ÷ 1 = 200
      - One tank would cover 200,000 sq. ft.

Boom Sprayer Calibration

- Step #5 – Determine Chemical Amount
  - Refer to product label for correct rate per 1,000 sq. ft.
  - Multiply Coverage x Rate = Amount of Chemical to Use in Sprayer
    - I.E. LESCO® Three-Way™ has application rate of 1.5 oz. per 1,000 sq. ft.
      - 200 x 1.5 oz. = 300 oz.
      - You would use 300 oz. of LESCO® Three-Way™ in your 200 gallon spray tank

Why Is This Important?

- An increase in vehicles speed during application or over estimated coverage:
  - Actual rate might be only 1 oz. per 1,000 sq. ft.
    - This rate may not kill targeted weeds
    - May need to go back and retreat
      - Additional costs for product, labor, and tarnished reputation

Why Is This Important?

- A decrease in vehicles speed during application or under estimated coverage
  - Actual rate might be 3 oz. per 1,000 sq. ft.
    - This rate will kill the targeted weed, but might also kill desirable grass
      - May have to go back to customer and reseed lawn
        - » Additional cost for seed, fertilizer, labor, & tarnished reputation
        - » Could be subject to fines and cease & desist orders if a complaint is filed with local Department of Agriculture office

Achieving the Correct Application Rate

- Many factors can influence rate including:
  - Application speed, Weather conditions, Age & condition of sprayer & boom
- Maintain the same application speed that was used during calibration
- Try not to overlap or under-lap too much
  - Use LESCO® Tracker Green® (also available in blue) to know where you have sprayed

Common Problems with Boom Sprayers

- Under-lapping
- Excessive over-lapping
- Clogged screen of the in-line filter
- Gun &/or nozzle worn out
- Nozzle clogged with debris
- Diaphragms wear out on pump affecting pressure
- Application speed varies

Boom Sprayer Maintenance Tips

- Empty & rinse sprayer after end of each round
  - Properly disposing of mixed chemical as per local regulations
  - Make sure pump, in-line filter, hoses, etc. are rinsed out
- Calibrate boom sprayer a minimum of once a month
  - Many factors can alter the application rate in a short period of time

Boom Sprayer Maintenance Tips

- When storing sprayer for winter, make sure there is RV Anti-freeze in pump, hoses, booms, etc.
- Change Oil, O-Rings, Diaphragms, etc. once a year
  - Frequency of use and chemical used by require changing these more often