



# EQUIPMENT CALIBRATION FORM

## - FIELD BOOM SPRAYER -

**Important:** To meet IPM standards, no less than three (3) calibrations must be completed on each piece of application equipment during the growing season. All application methods must be calibrated using the appropriate calibration worksheets.

Date of calibration: \_\_\_\_\_

Calibrated by (name): \_\_\_\_\_

If conducted by an outside service, please specify: \_\_\_\_\_

Note: During the on-site audit, the agent/employee will be asked to demonstrate this process.

Make and model of calibrated sprayer: \_\_\_\_\_

Nozzle information (size, type): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date of previous calibration: \_\_\_\_\_

# calibration of this season: \_\_\_\_\_

### The Calibration of a Field Boom Sprayer

Please complete the following 14 steps and provide comments on any observations made during the process. Reviewing these comments in the future will help identify any repetitive problems with this particular field boom sprayer.

1. You will need the following items to calibrate your sprayer:
  - Stop watch
  - Graduated cylinder
  - Enough buckets to catch the water from each nozzle
  - Measuring tape (long) or a measuring wheel
  - Calculator
  - Pen
  - Paper
  - Gloves, extra screens and extra tips, brush for cleaning nozzles
  - 2 people (one person to operate the sprayer while the other measures)
  
2. Fill the sprayer tank with clean water.
  
3. Run the Field Boom Sprayer and inspect all parts associated with spraying.
  - Check nozzles for drips
  - Check nozzles for clogs
  - Check for erratic spray patterns
  - Ensure that booms extend parallel to ground

Comments: \_\_\_\_\_

\_\_\_\_\_



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4. There are a number of settings on your field boom sprayer that influence calibration. Record these settings and remember that if you alter any of the settings, the calibration changes and you must recalibrate.

Pressure: \_\_\_\_\_ psi or kPa

Nozzles Used: \_\_\_\_\_ (e.g., 8004)

RPM of sprayer motor while driving and spraying (if applicable): \_\_\_\_\_

Gear setting (if applicable): \_\_\_\_\_

Comments: \_\_\_\_\_

5. Mark off a distance of approximately 60 metres or 100 feet using two stakes or other markers.

The distance used in this calibration is (**D**) = \_\_\_\_\_ meters or feet (circle unit used)

Area where this is located, for future reference: \_\_\_\_\_

6. Drive through the measured distance at your normal spraying speed, and record the travel time in seconds. Repeat this procedure and average the times.

Time 1 \_\_\_\_\_ seconds

Time 2 \_\_\_\_\_ seconds

Time 3 \_\_\_\_\_ seconds

Calculate the average driving time (**ADT**):

(Time 1 + Time 2 + Time 3) ÷ 3 = \_\_\_\_\_ seconds

7. Divide D by ADT to get your driving speed in m/sec or ft/sec.

**D** \_\_\_\_\_ ÷ **ADT** \_\_\_\_\_ = Driving speed \_\_\_\_\_ m/sec or ft/sec

Multiply m/sec by 3.6 to get km/hr. Multiply m/sec by 2.237 to get mph.

Multiply ft/sec by 0.682 to get mph.

Driving speed: \_\_\_\_\_ mph or \_\_\_\_\_ kph

Comments: \_\_\_\_\_

8. Count the number of nozzles

Number of Nozzles (**N**) = \_\_\_\_\_



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9. With the sprayer parked, run the sprayer at the same pressure level and catch the output from each nozzle in a measuring container for approximately 20 seconds (time each catch for accuracy). Make sure the boom is charged before you start to measure.

**Output from nozzle #:**

Comments:

Nozzle 1 \_\_\_\_\_ ml or fl oz  
 Nozzle 2 \_\_\_\_\_ ml or fl oz  
 Nozzle 3 \_\_\_\_\_ ml or fl oz  
 Nozzle 4 \_\_\_\_\_ ml or fl oz  
 Nozzle 5 \_\_\_\_\_ ml or fl oz  
 Nozzle 6 \_\_\_\_\_ ml or fl oz  
 Nozzle 7 \_\_\_\_\_ ml or fl oz  
 Nozzle 8 \_\_\_\_\_ ml or fl oz  
 Nozzle 9 \_\_\_\_\_ ml or fl oz  
 Nozzle 10 \_\_\_\_\_ ml or fl oz  
 Nozzle 11 \_\_\_\_\_ ml or fl oz  
 Nozzle 12 \_\_\_\_\_ ml or fl oz

**Sum Total** \_\_\_\_\_ ml or fl oz = Total Output from all nozzles (**TO**)

Catch time (**CT**) \_\_\_\_\_seconds

10. Check the accuracy of each nozzle. Calculate the average nozzle output by adding the individual nozzle outputs and then dividing by the number of nozzles tested.

**TO** \_\_\_\_\_ ÷ **N** \_\_\_\_\_ = average nozzle output (**ANO**) \_\_\_\_\_ ml or fl oz

If an individual nozzle sample is more than 10 percent higher or lower than the average nozzle output, check for clogs and clean the tip or replace the nozzle. You only need to test the worst nozzle output on the high and low of the range.

Output from Nozzle \_\_\_\_\_ ÷ **ANO** \_\_\_\_\_ X 100% = \_\_\_\_\_% (between 90 and 110%)

Repeat steps 9 and 10 until the variation in discharge rate for all nozzles is within 10 percent of the average.

11. Calculate the total amount of water discharged per second, or the flow rate (**FR**).

(**ANO** \_\_\_\_\_ X **N** \_\_\_\_\_) ÷ **CT** \_\_\_\_\_ = Flow Rate (**FR**) \_\_\_\_\_ ml/sec or fl oz/sec



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12. Calculate the boom width (**W**)

Measure the distance in metres or feet between the nozzles.

Nozzle Spacing (**NS**) = \_\_\_\_\_ meters or feet

**NS** \_\_\_\_\_ X **N** \_\_\_\_\_ = boom width (**W**) \_\_\_\_\_ m or ft.

*Note: you must keep these as metres or feet so the units are correct during the area calculation. If measured in cm divide by 100; if measured in inches, divide by 12 (do not use fractions).*

13. Now, you have all the information you need to calculate the water volume, if you drive at the same speed as before.

Spray output (**SO**) = **ADT** \_\_\_\_\_ X **FR** \_\_\_\_\_ = \_\_\_\_\_

Area sprayed (**AS**) = **W** \_\_\_\_\_ X **D** \_\_\_\_\_ = \_\_\_\_\_

**SO** (ml or fl. oz) \_\_\_\_\_ ÷ **AS** (m<sup>2</sup> or ft<sup>2</sup>) \_\_\_\_\_ = water volume (**WV**) \_\_\_\_\_ quantity/area

Convert ml/m<sup>2</sup> to L/ m<sup>2</sup> by multiplying by 0.001 = \_\_\_\_\_

Convert ml/m<sup>2</sup> to L/100 m<sup>2</sup> by multiplying by 0.1 = \_\_\_\_\_

Convert to ml/m<sup>2</sup> to L/ha by multiplying by 10 = \_\_\_\_\_

Convert fl oz/ft<sup>2</sup> to gal/1000 ft<sup>2</sup> by multiplying by 7.8125 = \_\_\_\_\_

Convert fl oz/ft<sup>2</sup> to gal/A by multiplying by 344.163= \_\_\_\_\_

Convert ml/m<sup>2</sup> to gal/A by multiplying by 1.069 = \_\_\_\_\_

*Note: There are 1000mL in a litre and 128 fl. oz in a Gallon*

14. Check your calculations against the nozzle specifications to make sure you didn't make any errors.



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### Taking it to the Course

Please complete the following 3 steps. You now know the water volume you'll be applying to your spray area. Next is to mix up the tank of product and spray at the proper rate.

1. Measure the area you wish to spray (A) \_\_\_\_\_ m<sup>2</sup> or ft<sup>2</sup> then multiply by the water volume (WV) and that will tell you how much water you need to put in the tank.

$$A \text{ _____ m}^2 \text{ or ft}^2 \times WV \text{ _____ L/ m}^2 \text{ or gal/ ft}^2 = \text{ _____ L or gal in tank}$$

*You can "back-calculate" if you want to mix a full tank and then figure out how much area the full tank will cover. Divide the amount of water in the tank by the WV calculated, and that will give you the area that you can spray with one tank load.*

2. To calculate the amount of chemical to use, read the label. Multiply the label rate by the area you wish to spray and that is how much product you need to add to the tank.

$$A \text{ _____ m}^2 \text{ or ft}^2 \times \text{ _____ ml, oz, gm (from label rate)} \div \text{ _____ m}^2 \text{ or ft}^2 \text{ (from label rate)}$$

$$= \text{ _____ ml, oz, gm of product to add to tank}$$

*If you decide to mix up a full tank load, then you have to make sure you add enough product for the area that the tank load will cover, not the area you originally set out to spray.*

3. If you find that you are requiring different water volumes (this is usually stipulated on the product labels) you can change the pressure, driving speed, and most commonly, the nozzle tips. When you make these changes, you will have to recalibrate.

*Note: This form was prepared using information gathered from Engage Agro.  
For information, please contact: Engage Agro Corporation [www.engageagro.com](http://www.engageagro.com)*

*As the person calibrating the sprayer listed, I attest that the above information is correct and that the process was completed thoroughly.*

Licensed Exterminator Signature: \_\_\_\_\_

Date: \_\_\_\_\_

*Return form to IPM Agent once job is complete. IPM Agent must sign in confidence.*

IPM Agent Signature: \_\_\_\_\_

Date: \_\_\_\_\_