

# Sprayer Calibration

**How to assemble and calibrate a backpack  
sprayer?**

Rodrigo Werle

# Sprayer Calibration Introduction

## Why bother calibrating?

To maximize pesticide value

To minimize crop injury

To insure use of legal label rates

# Sprayer Calibration Introduction

We calibrate  
to make sure  
that this



Matches this



## SPECIAL USE TANK MIXES FOR SPRING AND FALL SEEDED WHEAT (See Footnotes for Applicable Uses)

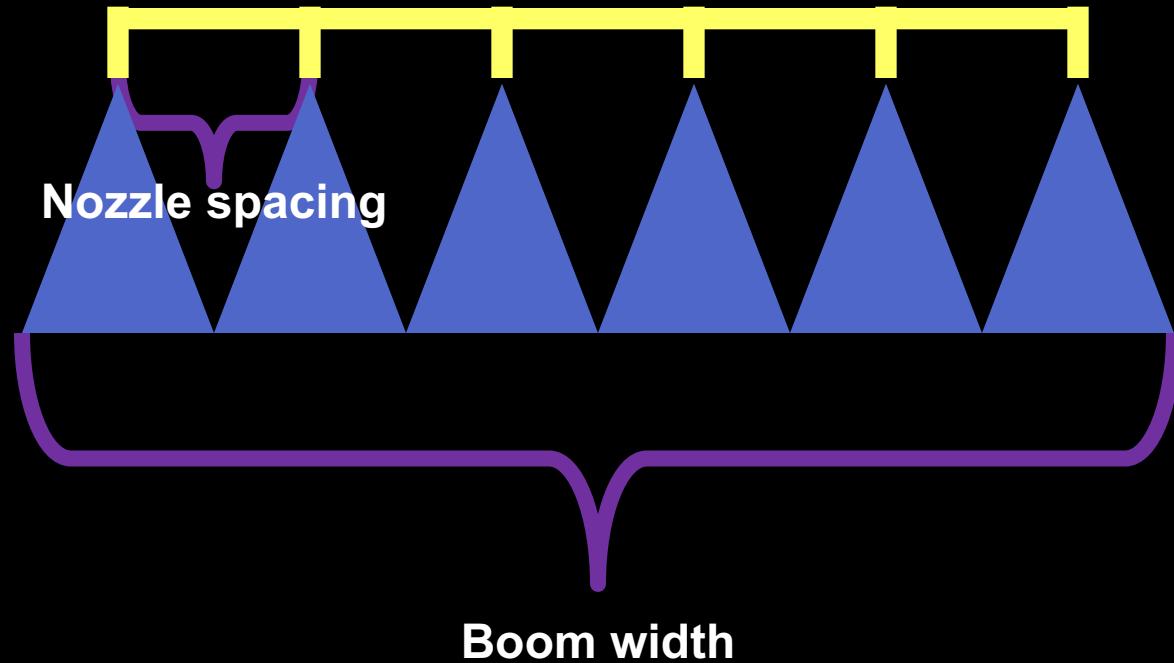
### BROADCAST RATE PER TREATED ACRE:

Apply 3-4(1) fluid ounces BANVEL with:

Product (2)	Active Ingredient	Formulation	Amount of Product Per Acre
2,4-D or MCPA Amine	2,4-D or MCPA	4 lb/gal	1 - 2 pts (3) (.5 - 1.0 lb a.i./A) (4)
2,4-D or MCPA Ester	2,4-D or MCPA	4 lb/gal	1 - 1.5 pts (3) (.5 - .75 lb a.i./A) (4)
Ally®	metsulfuron-methyl	60% DF	1/20 - 1/10 oz
Amber®	triasulfuron	75% DF	0.14 - 0.28 oz

# Sprayer Calibration Introduction

## Important Terms



# Sprayer Calibration Introduction

A sprayer has 6 nozzles  
which are spaced 20 inches apart.

What is the total boom width?

# Sprayer Calibration Introduction

## Abbreviations

### Abbreviations for dry formulations:

Abbr.	Meaning	Example
W, WP	Wettable Powder	Aatrex 80W
DF, WG	Dry Flowable	Bladex 90DF
G	Granular	Eptam 10G
P	Pellet	Spike 20P

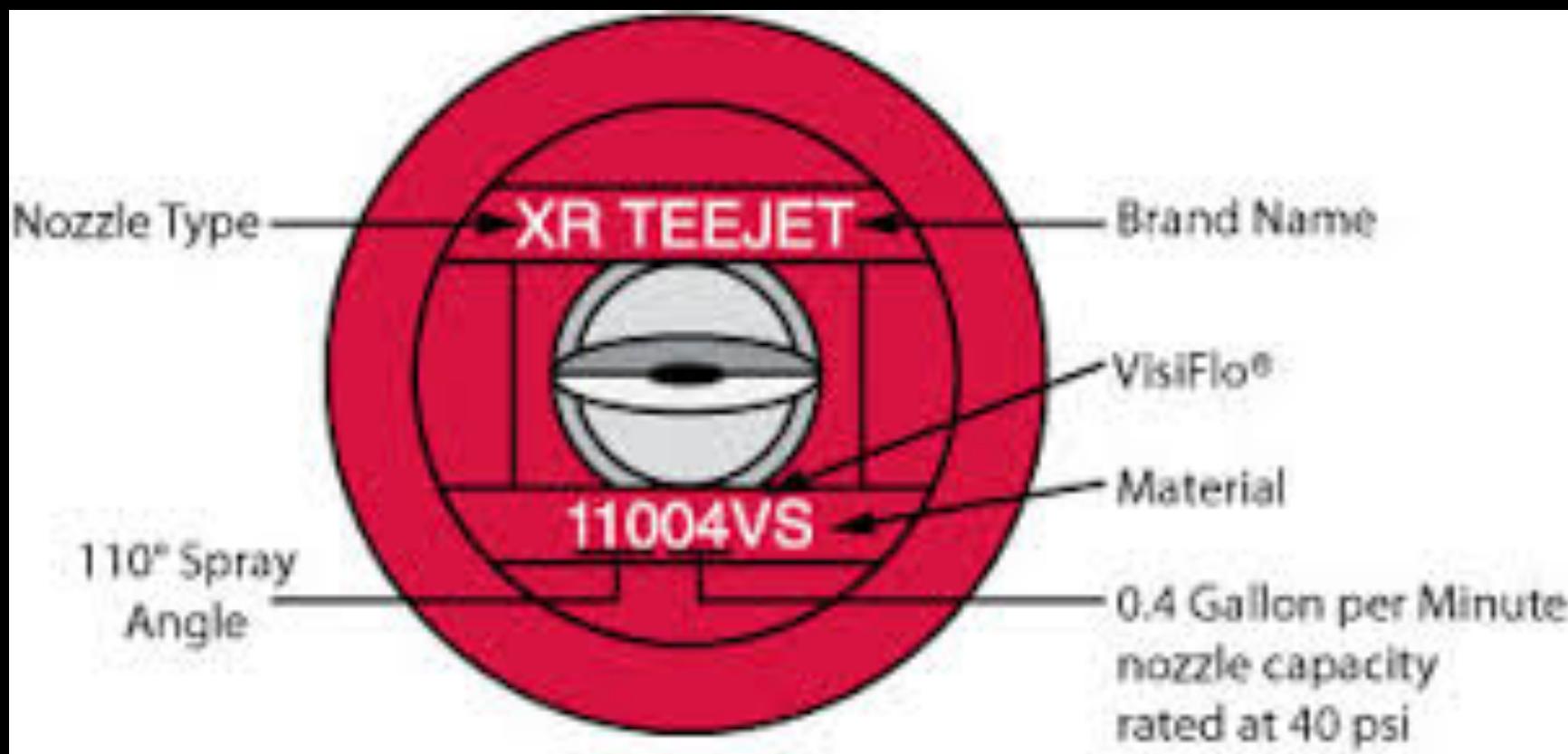


### Abbreviations for liquid formulations:

Abbr.	Meaning	Example
L, LF	Liquid Flowable	Aatrex 4L
SC	Soluble Concentrate	Authority Assist 4SC
E, EC	Emulsifiable Concentrate	Command 4EC



# Sprayer Calibration Introduction



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# Sprayer Calibration Overview

## The Timed Flow Method

1. Select nozzle type based on:
  - Method of application
  - Field conditions
  - Pesticide product
  - Sprayer pressure
2. Select nozzle tip (size) based on:
  - Target gallons per minute (GPM)
  - GPM based on: gpa, mph, nozzle spacing



# Sprayer Calibration Calculations

If we know the...

- Rate we want to apply ( $\frac{\text{gallons}}{\text{acre}}$ , GPA)
- Speed that we want to drive the sprayer ( $\frac{\text{miles}}{\text{hour}}$ , MPH)
- Spacing between the nozzles (inches, WIDTH)

Then how can we calculate the gallons that need to be delivered by each nozzle per minute ( $\frac{\text{gallons}}{\text{minute}}$ , GPM)?

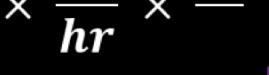
# Sprayer Calibration Calculations

$$GPM = \frac{GPA \times MPH \times WIDTH}{5940}$$

Where does the value 5940 come from?

# Sprayer Calibration Calculations

$$\frac{gal}{ac} \times \frac{mi}{hr} \times \frac{in}{\text{---}} \times \frac{1 \text{ hr} \cdot ac \cdot ft \cdot ft}{5940 min \cdot ft^2 \cdot mi \cdot in} = \frac{gal}{min}$$





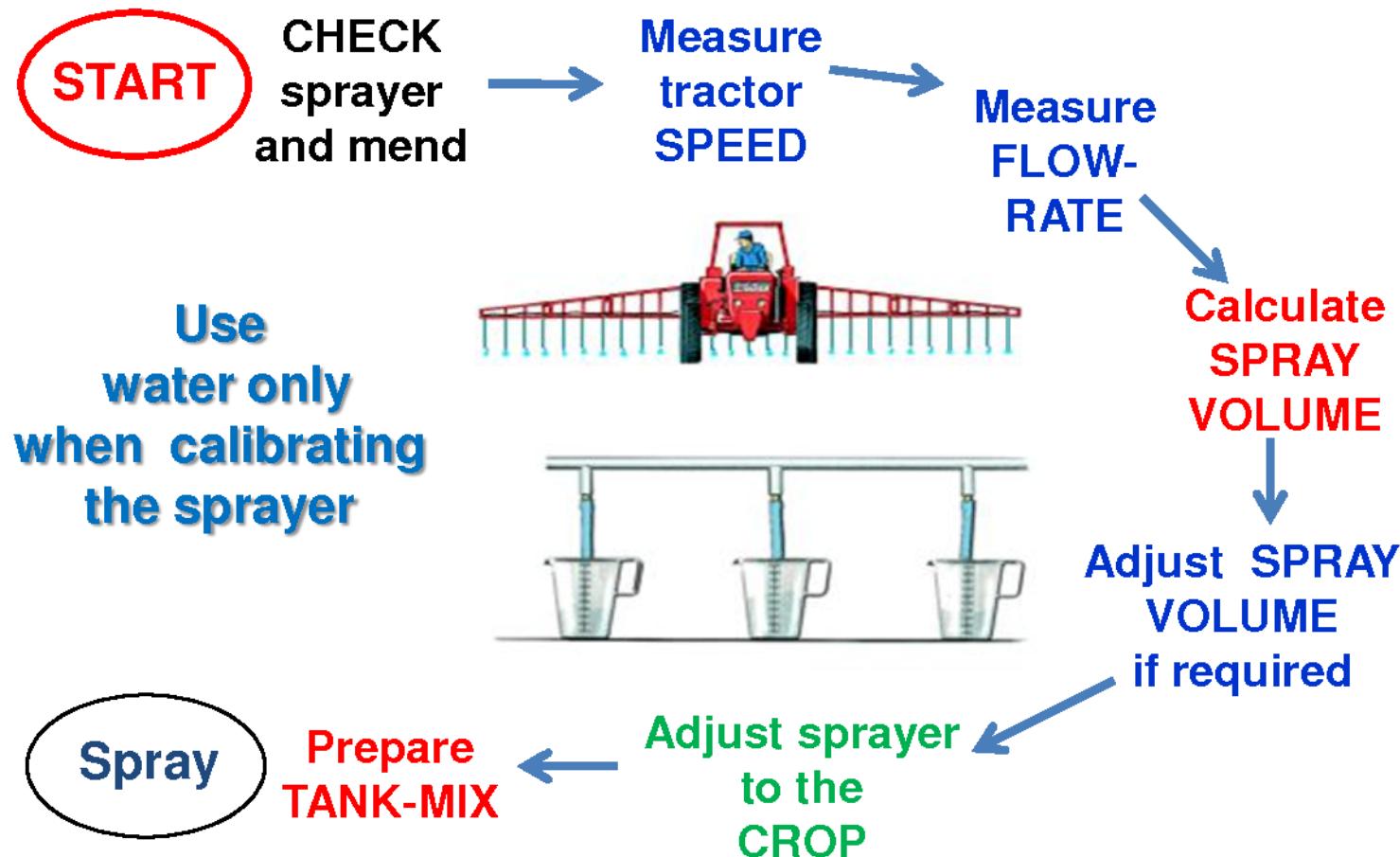
Starting units      New conversion      End units

# Volume/Pressure Ratio

$$V_1/V_2 = \sqrt{P_1} / \sqrt{P_2}$$

# Safe Use Initiative

## Boom sprayer calibration



What is the difference between a  
backpack sprayer and this self propelled  
crop sprayer?



# Sprayer Calibration Calculations

## Practice Problem

A low pressure field sprayer is equipped with 16 nozzles spaced on 20-inch centers. The desired delivery volume is 10 gpa. The sprayer is clocked at 5 mph over a 300 foot calibration pass.

*What is the boom delivery in gallons/min?*

# Sprayer Calibration Calculations

**Step 1. Find out GPM of each nozzle.**

$$GPM = \frac{GPA \times MPH \times WIDTH}{5940}$$

$$GPM = (10 \times 5 \times 20) / 5940$$

$$GPM = 0.168 \text{ GPM/nozzle}$$

# Sprayer Calibration Calculations

**Step 2. Find out the boom delivery (gal/min).**

$$\text{Boom delivery} = \frac{\text{GPM}}{\text{nozzle}} \times \frac{\text{nozzles}}{\text{boom}}$$

Boom delivery = 0.168 GPM/nozzle \* 16 nozzles/boom

Boom delivery = 2.69 GPM/boom

N  
Agronomy and Horticulture  
Greenhouse 2  
INSTITUTE OF AGRICULTURE  
AND NATURAL RESOURCES



# Sprayer Calibration Calculations

## Helpful Conversions

Volume:      1 gal = 4 qts = 3785 mL = 128 fl. oz.

1 qt = 2 pts

Area:            1 ac = 43,560 ft<sup>2</sup> = .40 ha

Weight:          1 lb = 16 oz. = 0.4554 kg

1 oz. = 28.35 g

Speed:           1 mph = 88 ft/min