

Pesticide Mixing and Calibration

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Why Calibrate?

- Maximize results
- Decrease risk of environmental or safety concerns
- Reduce waste and costs
 - Especially important with today's herbicides that are effective at very low rates of application (e.g. metsulfuron methyl used at rates as low as $\frac{1}{4}$ ounce/acre)

Calibration Goals

- Deliver the prescribed amount of active ingredient to the target
- Obtain uniform coverage
- Minimize the amount of off target drift
 - Labels all have precautions for reducing drift
 - Utilize correct nozzles and pressures

Achieving Calibration Goals (for liquids)

- Select the right tools (high volume vs low volume)
- Operate with appropriate nozzles and pressures
- Keep pressures constant
- Speed or rate of travel must be constant



Maximum Labeled Application Rates

- Read the label to determine maximum application rate allowed - EVEN IF YOU ARE MIXING on a Volume/Volume basis
- Some labels specifically mention allowable maximum product rates per acre

Examples of Label Language

- **Arsenal ®** “DO NOT exceed recommended dosage rate/acre.”
- **Arsenal ® PowerLine ™** “DO NOT apply more than 6 pints of Arsenal PowerLine per acre.”
- **Garlon ® 4** “Garlon 4 may be used at rates of up to 8 qt (8 lb a.e. triclopyr) per acre per year on non-crop.....”
- **Milestone ®VM** “High volume foliar treatments may be applied at rates equivalent to broadcast up to a maximum of 7 fl oz per acre per annual growing season.”

Milestone VM Concentration	FL OZ of Milestone VM applied per acre by spray volume (GPA) for various mixture concentrations									
	5	7.5	10	15	20	30	40	50	75	100
0.06%	0.5	0.5	1	1	2	2	3	4	6	8
0.10%	0.5	1	1	2	3	4	5	6	10	13
0.13%	1	1	2	2	3	5	6	8	12	
0.15%	1	1	2	3	4	6	8	10	14	
0.20%	1	2	3	4	5	8	10	13		
0.25%	2	2	3	5	6	10	13			
0.33%	2	3	4	6	8	13	17			
0.50%	3	5	6	10	13					
0.75%	5	7	10	14						
1.00%	6	10	13							
1.50%	10	14								

within broadcast application labeled rate (3-7 fl oz/ac)
within spot application labeled rate (less than 14 fl oz/ac)
above spot application labeled rate (greater than 14 fl oz/ac)

Slide courtesy Travis Rogers,



Calibration Steps

- If broadcast spraying – Check nozzles to ensure uniform volume delivery. More than 5% deviation requires new nozzle or cleaning.



Utilizing the 1/128 Method for Hand Sprayers and Hand Guns

1. Measure an area = $1/128^{\text{th}}$ Acre (18.5 ft x 18.5 ft)
2. Measure time to spray test area w/water (repeat several times and average)
3. Spray into a container for the same amount of time it took to spray the test area. Measure water collected in fl. oz. This number = gal./acre delivered.

Because a gallon = 128 ounces and the test area is 1/128th acre; oz/a = gal/a

Field Exercise – Step 1

Measure Test Area



Test Area Should Located in Operational Spray Conditions

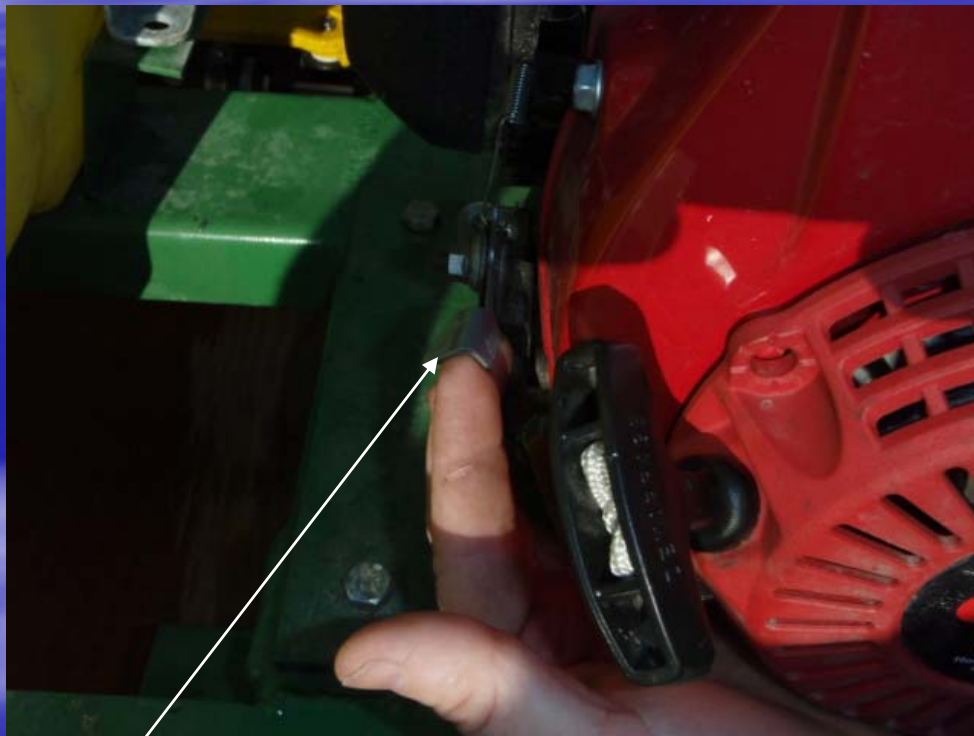


Turf – easy going

Brushy – not so easy



Step 2 - Set pump speed for consistent pressure and set hand gun for consistent pattern and volume



Motor Accelerator Lever

Handle Locking Screw



Step 3 – Measure the time it takes to spray area w/water



Step 4 – Spray into a container for time it took to spray test area



Step 5 – Measure the volume of water collected, in ounces.



Volume collected in ounces = gallons/acre

EXAMPLE

- Time to spray 340 sq. ft. area = 55 seconds
- Amount of water collected in 55 seconds = 80 ounces
- Gallons/acre = 80

Calculating the Amount of Pesticide to Add to Spray Tank

- Determine rate from the label
- Divide size (in gallons) of spray tank by gallons per acre calculated in the calibration. (i.e. 80 in our example) This equals the number of acres sprayed per tank. For Example: 5 gallon backpack $5/80 = .0625$ acres/tank.
- Multiply number of acres per tank times pesticide rate. For example: 1 qt 2,4-D/acre X 0.625 acres/tank = 32 fl.oz X 0.625 = 2 fl.oz./tank or $29.57 \text{ ml/fl.oz} \times 2 \text{ fl.oz/tank} = 59.14 \text{ ml per tank}$.

Mixing Considerations

- Follow label instructions on mixing order
- Example Fusilade® DX:
 - Fill tank with $\frac{1}{2}$ of required water volume and begin agitation. Add dry pesticide formulations.
 - Add Fusilade DX
 - Add liquid pesticide formulations
 - Add spray adjuvant and fertilizer (if used)
 - Add the remaining water and maintain agitation during spraying

Thank You for Your Attention



Sagebrush stops a train!



Don't let this happen to you.

Searching regulated articles for noxious weeds

