

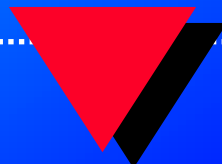


# Calibration of Pesticide Spray Equipment

**Using Formula Based On**

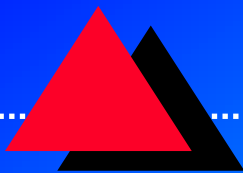
- 1. Nozzle Output**
- 2. Field Speed**
- 3. Nozzle Spacing**





# To Enhance Safety and Benefits and to Get the Most From Any Sprayer:

- ◆ Select the right equipment.
- ◆ Set it up correctly.
- ◆ Use proper operation procedures.
- ◆ Perform proper maintenance.





# Verifying Speed

Make a test strip to verify MPH

- $\frac{\text{Feet Traveled} \times 60}{\text{Seconds} \times 88^*}$
- Feet per second  $\times 0.682$

\* At 1 MPH, it takes 1 minute to travel 88 feet





# Speed

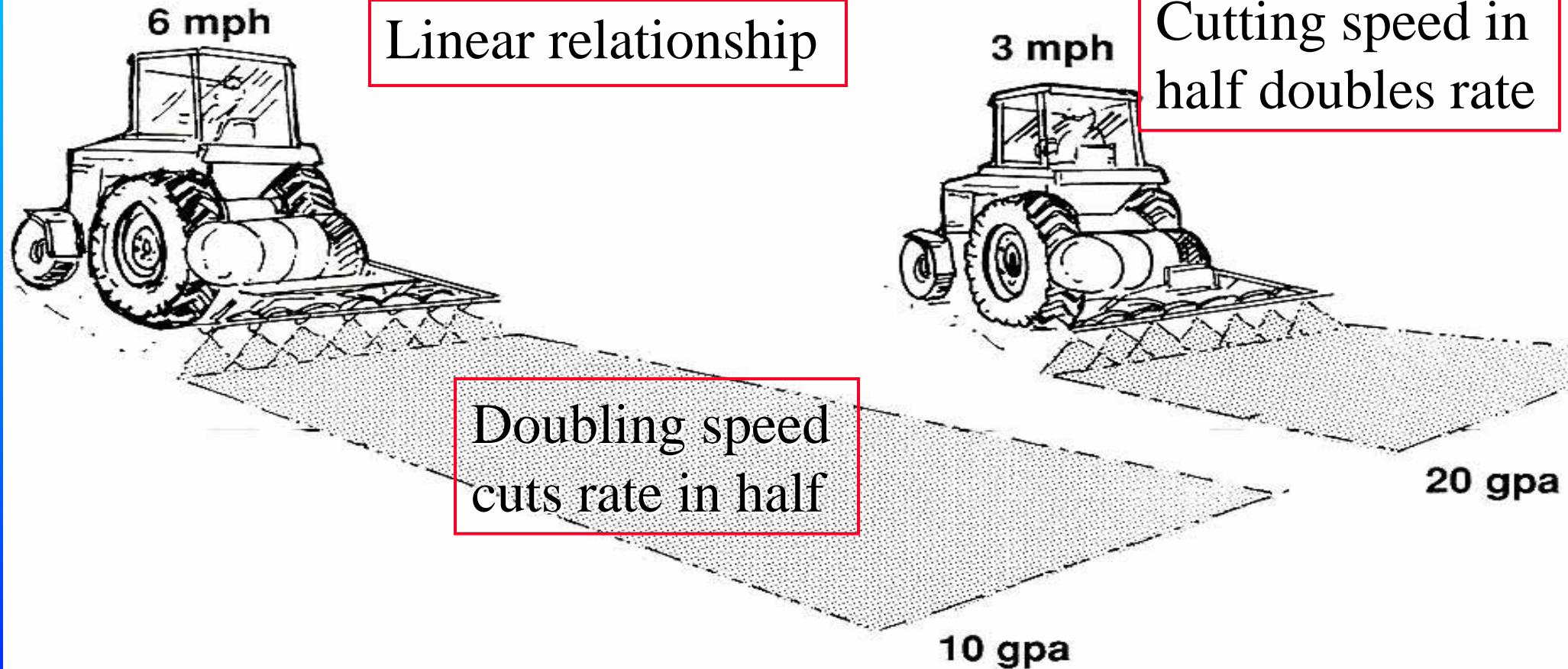
- ◆ **Test Strip Distance = 200 feet**
- ◆ **Seconds to travel strip = 27 seconds**

$$\frac{\text{200 feet traveled}}{\text{27 seconds}} \times 0.682 =$$

**5 MPH**



# Ground Speed





# Determine Nozzle Output





# Calibration Equation

$$\text{GPA} = \frac{\text{GPM} \times 5940}{\text{MPH} \times W}$$

**GPA = gallons per acre**

**GPM = gallons per minute**

**MPH = miles per hour**

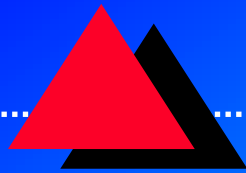
**W = width of spray in inches**





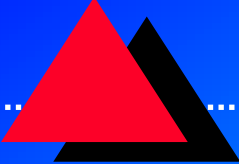
# Suggested Calibration Tools

- ◆ Measuring tape(s) - 100 ft tape and yardstick
- ◆ A watch capable of measuring seconds
  - stopwatch works best
- ◆ Measuring container marked in ounces
  - one quart works for most applications



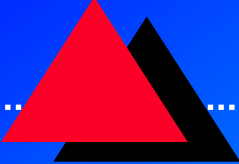


## To Increase Rate:

- ◆ Slow down
  - ◆ Use larger nozzle
  - ◆ Decrease nozzle spacing
  - ◆ Increase pressure
- 

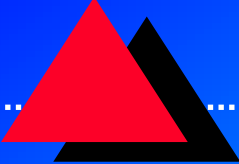


## To Decrease Rate:

- ◆ Speed up
  - ◆ Use smaller nozzle
  - ◆ Increase nozzle spacing
  - ◆ Decrease pressure
- 



# Useful Stuff

- ◆ Gallons = ounces/128
  - ◆ MPH = feet per second x 0.682
  - ◆ 1 Gal. = 4 quarts = 128 ounces
  - ◆ 1 Qt. = 2 pints = 32 ounces
  - ◆ 1 Acre = 43,560 sq.ft.
- 



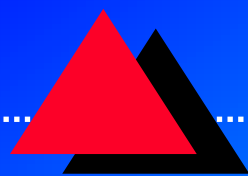
## Example 1.

Broadcast sprayer:  $W = 20$  inches,  
Discharge = 33oz/min., Speed = 440 ft/min

$$\text{GPM} = 33/128 = 0.26$$

$$\text{MPH} = 440/88 = 5$$

$$\text{GPA} = \frac{(0.26) \times (5,940)}{(5) \times (20)} = 15.4$$



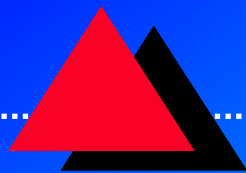


## Example 2.

Broadcast-Cluster Nozzle:  $W = 50$  ft. or  
 $(50)(12) = 600$  inches, Discharge = 7.4  
gallons per min., Speed = 352 ft/min

$$\text{MPH} = 352/88 = 4$$

$$\text{GPA} = \frac{(7.4) \times (5,490)}{(4) \times (600)} = 18.3$$





### Example 3.

Tank Mixing: 500 gallon tank, GPA = 20  
Recommendation calls for 2lb. Product/Ac.

$$500/20 = 25 \text{ acres per tankful}$$

$$(25)(2) = 50 \text{ lbs of Product per tankful}$$




## Example 4.

Tank Mixing: 15 gpa, 2-150 gal. tanks,  
3/4 pint Product/acre

Acres/Refill = Refill Capacity/GPA

Empty tanks:  $300/15 = 20$  acres

Second filling:  $280/15 = 18.67$  acres

**How many pints?**

$(20 \text{ acre mix})(3/4 \text{ pint/ac}) = 15 \text{ pints}$

$(18.67 \text{ acre mix})(3/4 \text{ pint/ac}) = 14 \text{ pints}$





## Example 5.

Purchasing Product: Recommendation is for 2 lb ai/acre, 300 acres of crop

Options: 80 WP or 4EC

Amnt. needed:  $(300\text{ac})(2\text{lb ai/ac}) = 600\text{ lb ai}$

$$600/0.80 = 750\text{ lbs of Product}$$

$(\text{Gallons needed})(4) = 600\text{ lb ai}$

$$600/4 = 150\text{ gallons of Product}$$
