

MULTIPLE NOZZLES OVER THE ROW BAND SPRAYING APPLICATION - GPA FORMULAS

Do not confuse band applications with cutting recommended gallon per acre rates. The rate applied on a Banding basis is normally the same rate recommended for broadcast applications. Banding of agricultural chemicals allows for increased acreage to be covered with the same tank volume by reducing the area being treated. Multiple nozzles over the row applications are calculated similar to a single nozzle banding except the flow calculated by the formula should then be divided by the quantity of nozzles producing the band.

FORMULA (1) - To determine the gallons per minute (GPM) capacity required for each spray tip to band agrichemicals in a multiple nozzle application.

$$\text{GPM (Per Nozzle)} = \left(\frac{\text{GPA} \times \text{MPH} \times \text{W}}{5940} \right) \div \text{N}$$

Where: GPA = Gallons Per Acre (Application) Rate
 MPH = Actual field speed in Miles Per Hour
 W = Band width inches
 N = Number of nozzles producing the Band

FORMULA (2) - To determine the gallons per Acre (GPA) on treated spray band:

$$\text{GPA (Treated Band)} = \frac{(\text{GPM} \times \text{N}) \times 5940}{\text{MPH} \times \text{W}}$$

Where: GPA = Gallons Per Acre (Application) Rate
 MPH = Actual field speed in Miles Per Hour
 W = Band width inches
 N = Number of nozzles producing the Band

FORMULA (3) - To determine the gallons of solution used over the actual Field Acre:

$$\text{GPA (Field Acre)} = \text{GPA (Treated Band)} \times \frac{\text{Band Width}}{\text{Row Spacing}}$$

EXAMPLES

If a farmer wants to find the correct capacity spray tip to use for "multiple nozzle banding" pesticide, he should know the chemical manufacturer's suggested application rate (GPA), actual field speed, and the quantity of nozzles per row. For example:

The farmer decides to use a recommended rate of 20 GPA, travel at 4 MPH, and spray a 15" wide band over the crop using 3 ConeJet tips. The correct capacity spray tip to use would be:

FORMULA (1): $\text{GPM (Per Nozzle)} = \left(\frac{20 \times 4 \times 15}{5940} \right) \div 3 = 0.067 \text{ GPM (Per Nozzle)}$

Using a TXSS-4 ConeJet Spray Tip at 40 PSI, we calibrate the equipment and note that the capacity is 0.067 GPM. If we are spraying a 15" band on 30" row spacing at 4 MPH, the GPA on the "Treated Band" would be:

FORMULA (2): $\text{GPA (Treated Band)} = \frac{(0.067 \times 3) \times 5940}{4 \times 15} = 20 \text{ GPA (Treated Band)}$

If we are spraying a 15" band on 30" row spacing at 4 MPH, the GPA on the "Treated Band" would be:

FORMULA (3): $\text{GPA (Field Acre)} = 20 \times \frac{15}{30} = 10 \text{ GPA (Field Acre)}$

It can be seen that applying agrichemicals in a narrow band as opposed to a broadcast application of 20 GPA increases the actual acres (field acres) covered with a tank solution. Figuring the farmer used a 100 gallon spray tank:

Banding:	10 Acres	=	$\frac{100 \text{ Gallon Tank}}{10 \text{ GPA (Field Acre)}}$
Broadcast:	5 Acres	=	$\frac{100 \text{ Gallon Tank}}{20 \text{ GPA (Field Acre)}}$

DESCRIPTION:
 CALCULATING GALLONS PER ACRE
 IN BAND SPRAYING APPLICATIONS
 USING MULTIPLE NOZZLES
 OVER THE ROW



Spraying Systems Co.®
 Spray Nozzles and Accessories
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