USEFUL FORMULAS

1. To determine the size of pump needed to apply a given number of gallons/acre.
   Pump Capacity =
   $$\frac{\text{gallons/acre desired x boom width (feet) x mph}}{495}$$

2. To determine the nozzle capacity in gallons per minute at a given rate/acre and miles/hour.
   Nozzle Capacity =
   $$\frac{\text{gallons/acre x nozzle spacing (inches) x mph}}{5940}$$

3. To determine the acres per hour sprayed.
   Acres per hour = $\dfrac{\text{swath width (inches) x mph}}{100}$

4. To determine the rate of speed in miles per hour.
   1. Measure off a distance of 300 to 500 ft.
   2. Measure in seconds the time it takes the tractor to go to the marked off distance.
   3. Multiply .682 times the distance traveled in feet and divide product by the number of seconds.
      MPH = $\dfrac{.682 \text{ x distance}}{\text{seconds}}$

5. To determine the nozzle flow rate.
   Time the seconds necessary to fill a pint jar from a nozzle. Divide the number of seconds into 7.5
   gallons/minute/nozzle = $\dfrac{7.5}{\text{seconds}}$

6. To determine the gallons per minute per boom.
   Figure out the gallons/minute nozzle and multiply by the number of nozzles.

7. To determine the gallons per acre delivered.
   $$\frac{5940 \text{ x gallons/minute/nozzle}}{\text{nozzle spacing (inches) x mph}} = gpa$$

8. To determine the acreage sprayed per hour.
   acres sprayed/hour = $\dfrac{\text{boom width (feet) x mph}}{12}$
   This allows 30% of time for filling, turning, etc.

9. Sprayer Tank Capacity
   Calculate as follows:
   1. Cylindrical Tanks:
   Multiply the length in inches times the square of the diameter in inches and multiply the product by .0034
   length x diameter squared x .0034 = # of gallons.
   2. Elliptical Tanks:
   Multiply the length in inches times the short diameter in inches times the long diameter in inches times .0034
   length x short diameter x long diameter x .0034 = number of gallons.
   3. Rectangular Tanks:
   Multiply the length times the width times the depth in inches and multiply the product by .004329
   length x width x depth x .004329 = # of gallons.

10. To determine the acres in a given area.
    Multiply the length in feet times the width in feet times 23. Move the decimal point 6 places to the left to give the actual acres.

MISCELLANEOUS EQUIVALENTS

9 in. equal 1 span.
6 ft equal 1 fathom.
6,080 ft. equal 1 nautical mile.
1 board ft. equals 144 cu. in.
1 cylindrical ft. contains 5&7/8 gals.
1 cu. ft. equals .8 bushel.
12 dozen (doz.) equal 1 gross (gr.)
1 gal. water weighs about 8&1/3 lbs.
1 gal. milk weighs about 8.6 lbs.
1 gal. cream weights about 8.4 lbs.
46 ½ qts. of milk weighs 100 lbs.
1 cu. ft. water weighs 62 ½ lbs., contains 7&½ gals.
1 gal. kerosene weighs about 6&½ lbs.
1 bbl. cement contains 3.8 cu. ft.
1 bbl. oil contains 42 gals.
1 standard bale cotton weighs 480 lbs.
1 keg of nails weighs 100 lbs.
4 in. equal 1 hand in measuring horses.

WIDTH OF AREA TO ACRES PER MILE TRAVELED

Width of Strip (feet)	Acres/Mile
6	.72
10	1.21
12	1.45
16	1.93
18	2.18
20	2.42
25	3.02
30	3.63
50	6.04
75	9.06
100	12.10
150	18.14
200	24.20
300	36.30

MPH CONVERTED TO FEET PER MINUTE

MPH	fpm
1	88
2	176
3	264
4	252

If you have any questions, concerns or would like to share something that you have found helpful in your spraying practices e-mail to: pbm@pbmsprayers.com. Spray tips offered by PBM are from our experiences, some are from input we have received from our customers and other spray equipment operators who wish to share successes they have had. We hope these tips help you, but cannot accept liability for any damage to property or individuals should you choose to use them in your spraying practices.