



Extension Pesticide Applicator Training Series—#3 Treatment Area Measurements

Guide A-612

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IN THIS SERIES:

1. Pest Identification
2. Pest Management Practices
- 3. Treatment Area Measurements**
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5. Calculating Pesticide Amounts of Broadcast Applications

WHY KNOW SURFACE MEASUREMENT OF THE TARGET AREA?

All pesticides that are labeled by U.S. Environmental Protection Agency have a specified range of the rate of pesticide that can be legally applied to a unit area of land. In order to apply the recommended or required amount of a pesticide, the surface area must be known. If more or less than the specified range is used, the use is not in compliance with the label and would be a violation of federal law.

Whether the amount of pesticide is a requirement or a recommendation, it is best management to know **how much** is being applied. Even with products that are not labeled, such as soil amendments, surfactants or liquid fertilizers, it is good management to know the economic and environmental effectiveness and efficiency of the application.

FIELD MEASUREMENT NOTES

Recorded measurements and simple field drawings are useful when determining surface area. Basic sketches of the area will help to show the sides being measured, obstacles not targeted for application, insert transverse lines for area calculations (described below), and other considerations. Once the area is accurately measured, field notes can be kept for future reference or revision.

Surface area measurements need to be made only once, providing the plot size does not change. Area measurement records should be kept along with field pesticide history records.

MEASUREMENT TOOLS

For most jobs, a **100-foot measuring tape** is adequate. Vinyl or plastic tapes are easier to move around the field and resist abrasion better than metal tapes. However, any measuring tape of 25 feet or more can be used.

When measuring lengths greater than the tape measure, it is handy to have a set (6-10) of metal stakes or pins that can be put in the ground to determine where the measurement stopped and where to begin again. Determine the sum of the measurements for the total length of a side.

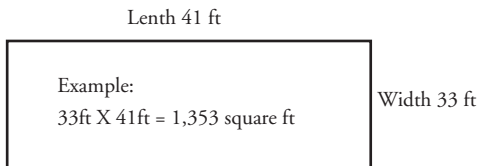
An inexpensive chain or cord marked in 5- or 10-foot intervals may be useful when measuring areas on a frequent basis. With paint or indelible marker, measured intervals can be spaced on the cord. Different colors can be used to mark different lengths for easier counting, e.g. black every 5 feet and red every 25 feet. The cord can be made as long as necessary for the type work being done.

If measuring tools are not available, determining the length of a side can be estimated by pacing. It is best to have previously measured the average pace of the person who is doing the walking. Fairly accurate estimates can be made if the pacer knows beforehand the length of 10 paces. Be aware that certain terrains will change the length of a person's pace. A consistent pace is important when using this method.

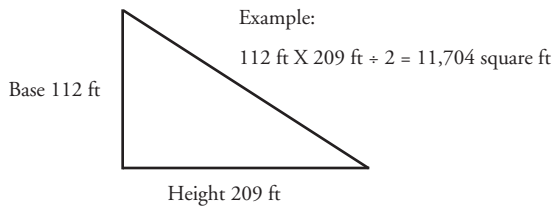
BASIC GEOMETRY FOR DETERMINING SURFACE AREA

A few basic geometry formulas are essential for calculating surface area. With the known lengths of sides and establishing 'imaginary' transverse lines at strategic points, nearly any area measurement of a field can be made. When plugging measurements into the formulas, be certain to keep all the units the same - usually in feet.

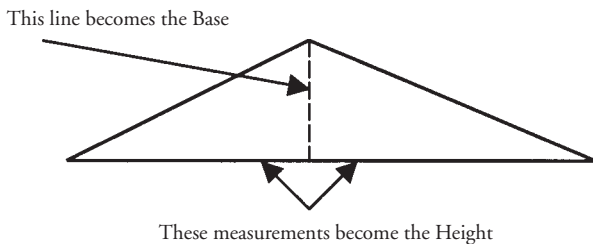
Square-and Rectangular-Shaped Fields – Length (L) X Width (W) = Area



Fields with Right Triangles – Base X Height ÷ 2 = Area



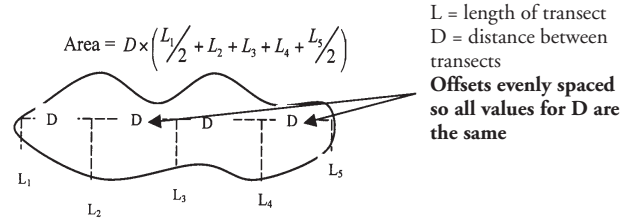
Triangle Shapes with No Square Corners – Create right angles by choosing a transverse line and measuring the length of the new side. Include the new lines in your field drawing.



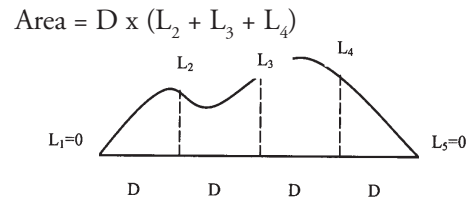
Other Straight-Sided Irregular Shapes – As in the example above, divide irregular fields into squares, rectangles and triangles by using strategically placed transverse lines.



Measuring Irregular-Shaped Edges – Area measurements of curve-sided fields require more transverse lines but are still fairly simple to calculate.



When the curved boundary crosses a straight base line:



GPS AREA MEASUREMENT

Most handheld Global Positioning System (GPS) units purchased today feature an area surface measurement function. The GPS area calculator function will determine the total surface area within a mapped perimeter. This requires that the entire perimeter of the area to be measured is walked (or driven). Accuracy is contingent upon the number and angle of satellite links received by the unit. With the margin of error involved using GPS, they are best used for larger areas where physical measurement is impractical.

Other Useful Information for Determining Surface Area

Area of a circle = Radius² X 3.14
1 Acre = 43,560 square feet
Square feet ÷ 43,560 = total acreage

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