What is soil drenching and injection?
- Application of systemic pesticides to trees, hedges, shrubs, or clumped groups of plants
- Pesticides are absorbed by plant roots and move to growing points in trees and bushes

Tree injection and implants
- Capsules with a pre-measured amount of pesticide
  - Number of capsules to use depends on diameter at breast height (DBH)
  - Slow-release capsules remain in holes that you drill in the tree trunk
- Tree injection
  - Drill holes
  - Inject measured amount of pesticide with high-pressure gun

Soil drenching: Calculating application rate using DBH for individual trees or shrubs

Read the label to find the rate of application (usually stated by the amount needed per inch of plant height or per inch of trunk DBH)

1. Wrap a tape measure or string around the trunk at chest height.
   Diameter = circumference X 0.32

2. Calculate the application rate.

Example:
Label rate = 1.2 tsp per inch of trunk diameter
Tree DBH = 15-inch
Application rate = DBH X labeled rate

   15 inches X 1.2 tsp/inch = 18 tsp

3. Convert to liquid ounces.
   18 tsp ÷ 6 tsp/oz = 3 oz

4. For more than one tree, multiply the application rate by the number of trees you have.

5. Determine how much water to mix by reading the label. Mix the pesticide in a bucket containing the measured amount of water.
Soil drenching: Calculating application rate for grouped plantings of trees or shrubs

1. Determine the height of each tree or shrub, and add all the heights together.

2. Determine the amount of pesticide to apply by dividing the cumulative height by the label rate.

Example:
Site = Bed of 6 shrubs
Label rate = 1 ounce/20 cumulative feet
Height = 30 cumulative feet

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30 \text{ ft} \div 20 \text{ ft/oz} = 1.5 \text{ oz}
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3. Determine how much to dilute it before application.

Example:
Label = dilute in 10 gallons water/1000 sq ft treated surface
Site = 4 ft by 25 ft soil bed = 100 sq ft

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10 \text{ gal/1000 sq ft} = 0.01 \text{ gallons/sq ft} \\
100 \text{ sq ft} \times 0.01 \text{ gallon/sq ft} = 1 \text{ gallon of water needed for the treatment area}
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Dilute 1.5 fl oz pesticide in a minimum of 1 gallon of water
Calibrating powered soil injection equipment

1. Fill tank with water
2. Place the end of the injection probe into a calibrated container
3. Turn on the equipment
4. Measure the output delivered in 1 minute
5. Repeat several times to get an average

Example:
Apply 128 fl oz (4 quarts) of diluted pesticide to the soil
Use 4 injection sites – 1 qt in each hole
Output = 5 qts/min

How long will it take to deliver 1 qt?
1 qt ÷ 5 qts/min = 0.20 minutes
0.20 min X 60 sec/min = 12 seconds

It will take 12 seconds to inject 1 qt of mixture into 1 hole

Calibrating hand held injectors

1. Measure the output.

   Example: Label tells you to set injector to the 5 ml setting to deliver 1/6 fl oz per stroke
   (to apply 1 fl oz, you need 6 strikes)

2. Set the injector and fill with water.

3. Place a firm object in the bottom of a container, rest the probe on the object and make 12 strikes.

4. Measure the water captured in the container.

5. Repeat the process to get an average.

Example:
At the 5 ml setting, 12 strikes release 2 fl oz
Label rate = inject 20 fl oz around each tree
You use 5 soil injection holes

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20 \text{ fl oz} \div 5 \text{ holes} = 4 \text{ fl oz/hole}
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If 12 strikes release 2 oz, then you need to make 24 strikes into each hole to release 4 fl oz