Many North Carolina Fraser fir Christmas tree growers are using Roundup® Original or an identical formulation at reduced rates to suppress weed growth between rows of trees (middles). This fact sheet describes a method for calibrating backpack sprayers for this “chemical mowing” process.

**EQUIPMENT RECOMMENDED FOR CHEMICAL MOWING**
- Single nozzle backpack sprayer
- 150 degree (wide-angle) nozzle, Tee Jet brand: TK or TQ series.
- 50 mesh nozzle screen
- Yellow pressure regulator (14 psi.) (Available from Solo Company)
- Stop watch or watch with second hand
- 2-quart measuring cup
- Graduated cylinder or any device capable of fine measurement

**BACKPACK SPRAYER PREP**
1. Clean the nozzle and screen in soapy water with a soft brush. (Never use a knife or wire to clean nozzles. It will ruin them.)
2. In a place away from any wells or water supplies, rinse the spray tank thoroughly and partially fill it with clean water.
3. Reinstall the nozzle and screen.
4. Pressureize the sprayer and check output for even pattern on a dry surface. If the pattern is uneven, replace or clean nozzle. Inspect the sprayer for leaks.

**BACKPACK SPRAYER CALIBRATION**
1. Always calibrate in the field you are planning to treat.
2. Add 1-2 gallons of clean water to the backpack. Walking at a steady pace, practice spraying down the center of the rows while keeping the 150 degree nozzle knee high. The goal is to cover the middles, 5-6 feet across, without waging the nozzle back and forth. Foliage at the base of trees will be hit without damage as long as the recommended rates and date windows (see table on the next page) are followed accurately.
3. Divide 340 by the measured spray width to determine the length of the calibration course. The result will give a calibration course area of 340 square feet (340 square feet = 1/120th of an acre).
4. Tag a tree down the row that comes closest to the specified distance.
5. Using a consistent, comfortable pace, record the number of seconds it takes to spray the calibration course. Take an average of at least two trips, once in each direction. Always use the pressure regulator.

**CALIBRATING A BACKPACK SPRAYER FOR CHEMICAL MOWING**

**TIPS ON WORKING SAFELY WITH PESTICIDES IN NORTH CAROLINA**

*Published by North Carolina Environmental Stewardship Project of CropLife Foundation
1156 15th Street, NW, Suite 400, Washington, DC 20005, 202.296.1585*
BACKPACK SPRAYER CALIBRATION CONTINUED

1. Determining the area to be treated. Calculate the number of acres in the field or orchard by dividing the total field width (in feet) by the nozzle spray width. For example, 500 feet divided by 4 feet = 125 acres.

2. Determining the output of your sprayer. The output of a sprayer is the amount of water applied per acre. It is measured in gallons per acre (GPA). To determine the GPA, you will need to calibrate your sprayer. You can do this by:
   - Filling a graduated cylinder with 3 gallons of water.
   - Spraying the water into the graduated cylinder for 17 seconds.
   - Recording the amount of water collected in ounces.
   - Calculating the GPA for the sprayer.

3. Determining the rate of Roundup® needed. To determine the rate of Roundup® needed, you will need to:
   - Decide on the number of acres to be treated.
   - Determine the output of your sprayer in GPA.
   - Calculate the number of gallons needed per acre.
   - Mix Roundup® and water to the desired concentration.

4. Recipes for Roundup®. The following recipes are designed to help you accurately apply Roundup® to your field. Each recipe is based on a 3-gallon load of water.

5. Determining the rate of Roundup®. The rate of Roundup® can be determined by:
   - Deciding on the number of acres to be treated.
   - Determining the output of your sprayer in GPA.
   - Calculating the number of gallons needed per acre.
   - Mixing Roundup® and water to the desired concentration.

6. Key to success. When applying Roundup®, it is important to:
   - Follow the recommended rates.
   - Limit the treatment to the area of interest.
   - Use the correct spray equipment.
   - Apply the Roundup® evenly.

7. Conclusion. The use of Roundup® is an effective way to control weeds in orchards and fields. However, it is important to follow the recommended rates and use the proper equipment to ensure the best results.