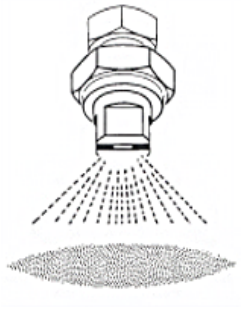
Pesticide Record Keeping Handbook & Calibration Guide For Private Applicators



Montana Pesticide Education Program
Montana State University Extension

Bozeman, Montana

MONTANA STATE UNIVERSITY | EXTENSION

Pesticide Record Keeping Handbook & Calibration Guide

Updated and edited by Cecil Tharp
(MSU Pesticide Education Specialist).
This publication was updated and edited from previous versions written and compiled by Reeves Petroff.

Emergency Phone Numbers

Rocky Mountain Poison Center:
1-800-332-3073; http://www.RMPDC.org

Chemtrec: Info on spills, leaks, fires & accidents involving hazardous chemicals. (24 hours)
1-800-424-3900

Non-emergency numbers

For more information regarding recordkeeping requirements or calibrating your sprayers contact your county Extension office or:

MSU Pesticide Education Program
PO Box 172900, Montana State University
Bozeman, MT 59717-2900
Phone: (406)994-5067
Email: ctharp@montana.edu
Website: http://www.pesticides.montana.edu

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Personal Information

***Name** _____

***Applicator ID No.** _____ **-11**

* Indicates Required Information

License Expiration Date: (valid thru) _____

Address:

Telephone:

Mobile:

Other Information:

Keeping Records of RUP Applications

The 1990 Farm Bill requires certified private pesticide applicators to keep records of all applications of federally restricted use pesticides. The USDA Agricultural Marketing Service carries out the provisions of this program. The objective of this booklet is to provide a simple method to meet the federal record keeping requirements. Keeping good records can save you money & improve farm management.

Guidelines in this booklet are not intended to meet the record keeping requirements for Montana Commercial & Governmental applicators. These professional applicators must record additional information beyond what is specified here. Tables are provided to record field location, crop, date of application, pesticide brand name, EPA registration number, acres treated, & total amount of undiluted product used. Pages are also provided if you choose to draw a map of treated locations.

Make sure that you fill in your name & applicator ID number. In Montana, applicator ID numbers are noted on your license and ends in –11.

Private Applicator Record Keeping Requirements

1. Applicator **name** & **applicator ID** number.
2. The **month, day & year** of the application.
3. The **location**. Can use many methods including description of county, township, range & section, maps, UTM grids,latitude/longitude, legal property descriptions, or google maps.

4. The **size** of the area treated. Use simple calibration formulas…

   $$\frac{\text{Gallons of mix used}}{\text{Sprayer GPA}} = \text{acres applied}$$

5. Total **amount of undiluted product** used, not the total mix. Do not note labeled rate. Use simple calibration formula.

   Amount = product rate (in acres) x acres applied

6. The **crop, commodity, stored product, or site** to which the pesticide was applied.
7. The **brand or product name** of the RUP.
8. The Environmental Protection Agency **(EPA) Registration Number.**

These records must be logged within 14 days of application & kept for 2 years following application.

Recording Spot Applications

Spot treatments are applications of RUPs made on the **same day** to a **sprayed area** of less than 1/10 (0.1) acre. It could be 0.1 acres of weeds scattered over 2 acres. In addition to conventional private applicator requirements, applicators conducting spot applications must record specific locations.

Example: Spot application along fence in field 6 (refer to map 3). Map 3 would further coarsely outline area.

Example: Spot application randomly within field 3 (refer to map 2). Map 2 would further coarsely outline area.

Example: Spot application east of machine shed.

Let's say you used 5 gallons of solution, and your sprayer was calibrated to deliver 50 gallons per acre. Using the following formula you would calculate that you covered 0.1 acres.

$$\frac{\text{Gallons of mix used}}{\text{Sprayer GPA}} = \text{acres applied}$$

NOTE (for spot apps > 0.1 acres): Example: If you covered 0.2 acres, simply record your spot applications as two 0.1 acre applications.

Agricultural Employers

In addition to private applicator requirements agricultural employers need to follow WPS requirements by recording:

- Time of application
- Active ingredients
- Restricted Entry Interval

Who Has Access to Your Records

RUP records can be inspected at any time by authorized representatives of the USDA & the Montana Department of Agriculture. In addition, a licensed health care professional or someone working under a professional's supervision, can request the record information.

Commercially Applied Pesticides

Federal recordkeeping regulations require that professional applicators furnish a copy of the required information to the customer within 30 days of the restricted-use pesticides application. The customer then retains those records for 2 years following the application. Use the tables in this booklet to make note of and reference to custom-application information.

How To Use This Booklet

1. Enter your name and Applicator ID number on the inside cover. Your Applicator ID number ends in –11.
2. Tables are set up so that you can enter multiple dates for the same location.
3. Use blank pages to draw maps and location descriptions. Just make reference to the map page in the tables. Example. If you have a hand drawn map and location description, you can note the following under Field Name and Location: “See page 12 for map.”
4. Make sure that tables are complete. Failure to note any one requirement may result in an incomplete record and possible fine.
5. **Do not** write in “labeled rate” for **Amount** or the farm address for **Location.**
6. Remember! You are required to record RUP application information within 14 days of application and you must retain these records for 2 years following the application.

Guidelines in this booklet are not intended to meet the Montana record keeping requirements for commercial and governmental applicators.

Example

Individual Field Pesticide Use Record

Field Name and Location: Lower Pasture. SW, SW, T2S, R5E. See Farm Map for details (Kelly Canyon Quadrangle, USGS 7.5 minute map)

Site/Crop: Rangeland

Date	Brand Name	EPA Reg No.	Size	Amount
5/20/12	Kaboom	34-345-345	25 acres	25 pints
6/15/12	Kaboom	34-345-345	25 acres	25 pints
8/20/12	Kaboom	34-345-345	5 acres	2 ounces

Size (acres) = Gallons used ÷ GPA Amount = acres x product rate

Notes:

Size: 500 gallons ÷ 20 GPA = 25 Acres

Amount: 25 acres x 1 pt/acre = 25 pints

10 gallons ÷ 80 GPA (backpack) = 0.125 Acres

0.125 acres x 1 pt/acre = 0.125 pints x 16 oz. per pint = 2 ounces

Treatment on 8/20/12 was a spot treatment over entire 25 acre pasture.

Individual Field Pesticide Use Record

Field Name and Location:				
Site/Crop:				
Date	**Brand Name**	**EPA Reg No.**	**Size**	**Amount**

Size (acres) = Gallons used ÷ GPA Amount = acres x product rate

Notes:

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Date	**Brand Name**	**EPA Reg No.**	**Size**	**Amount**

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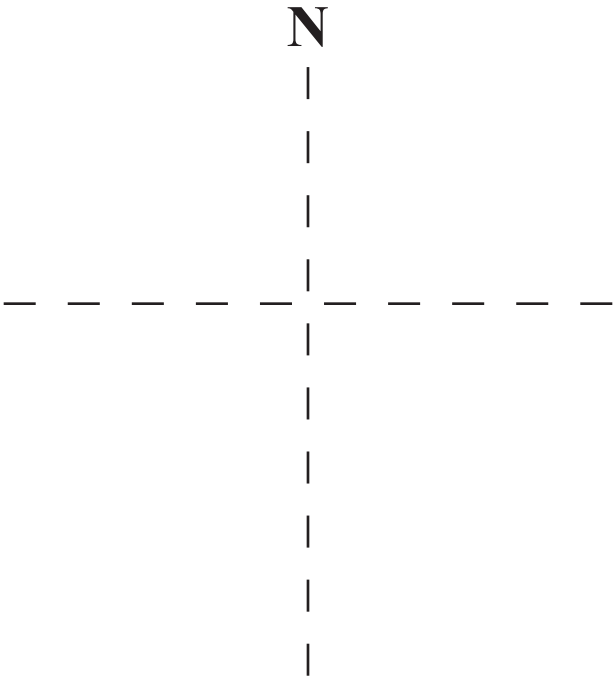

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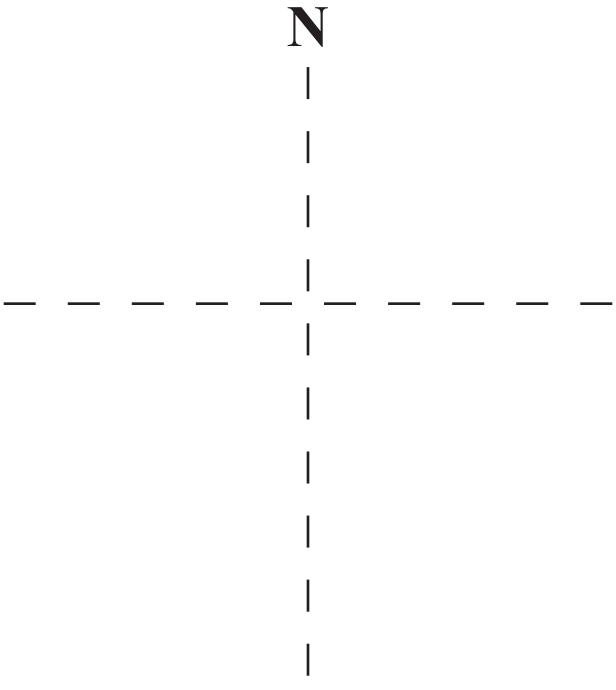

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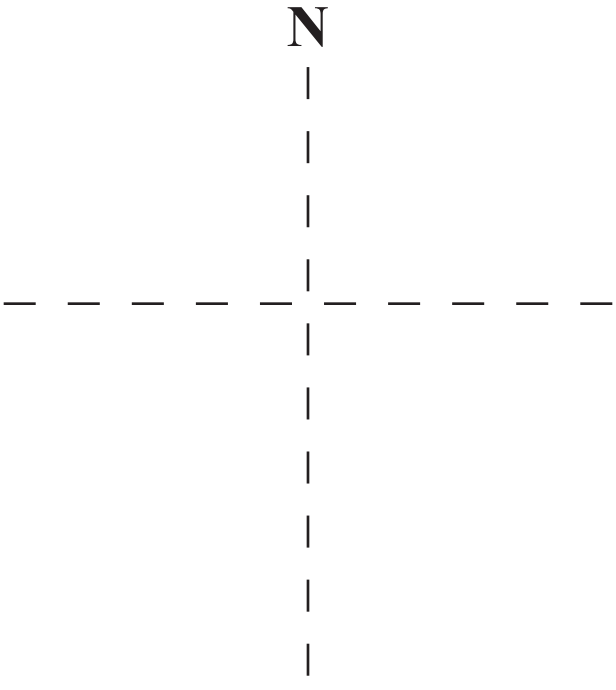

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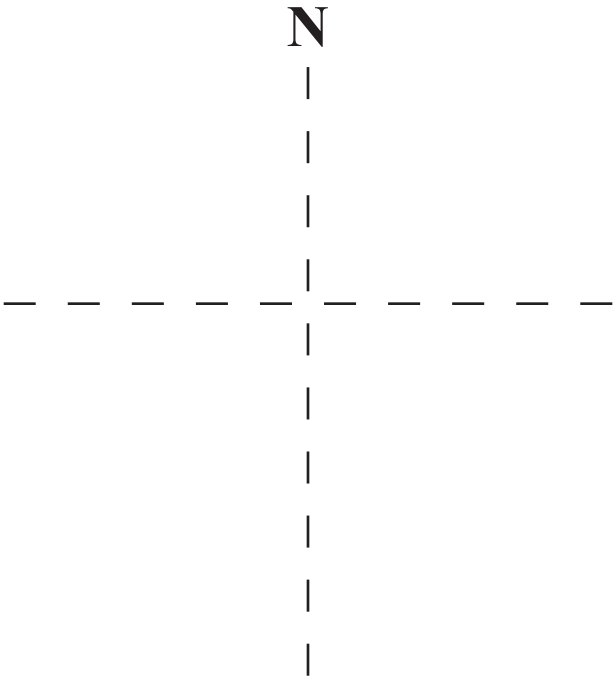

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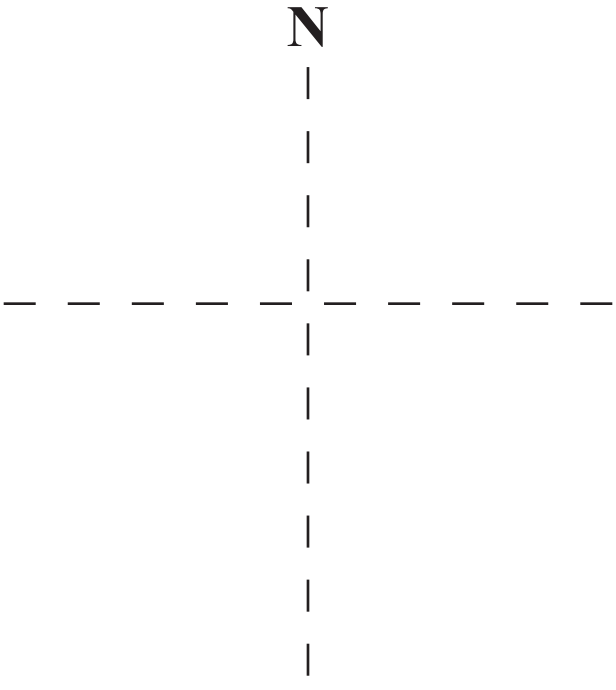

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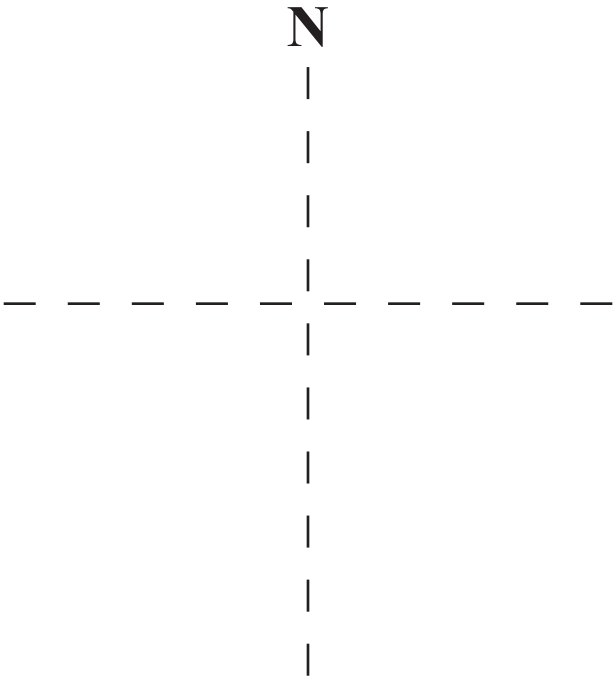

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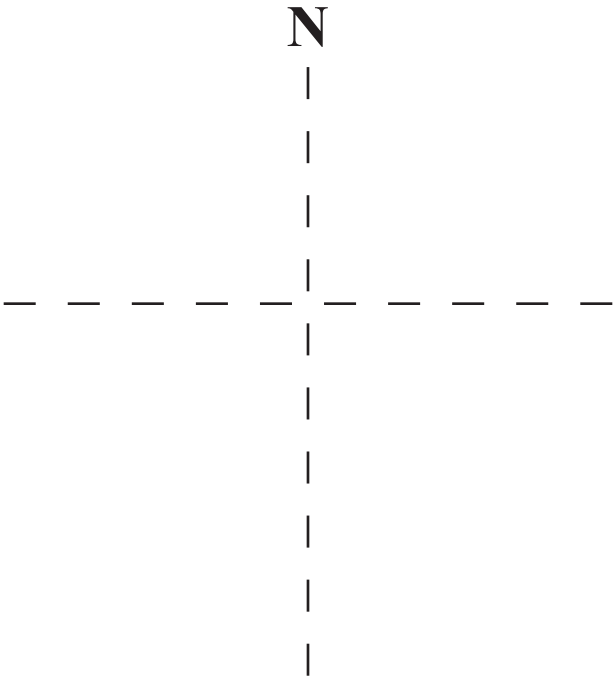

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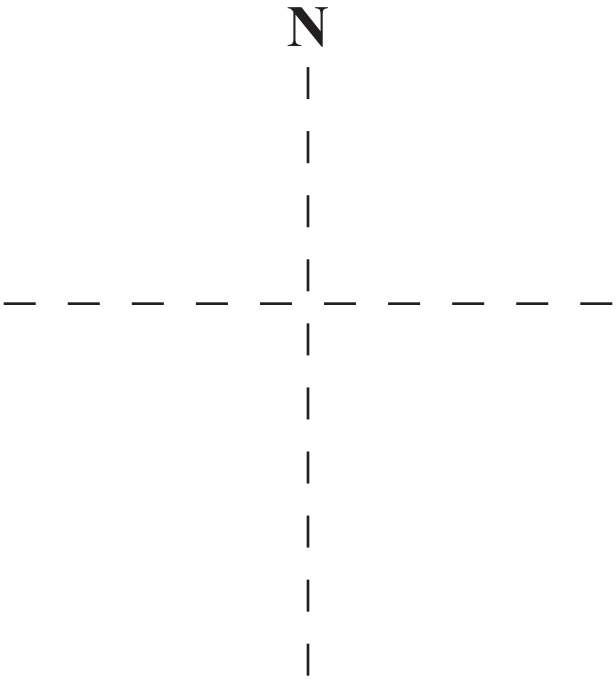

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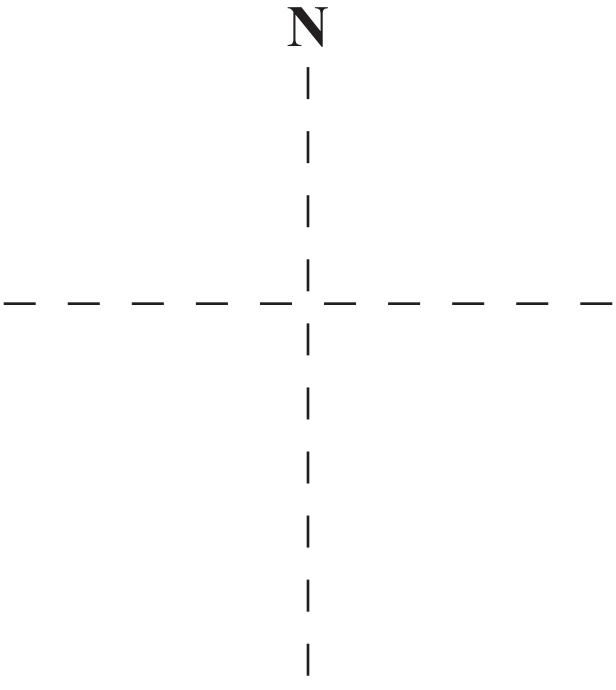

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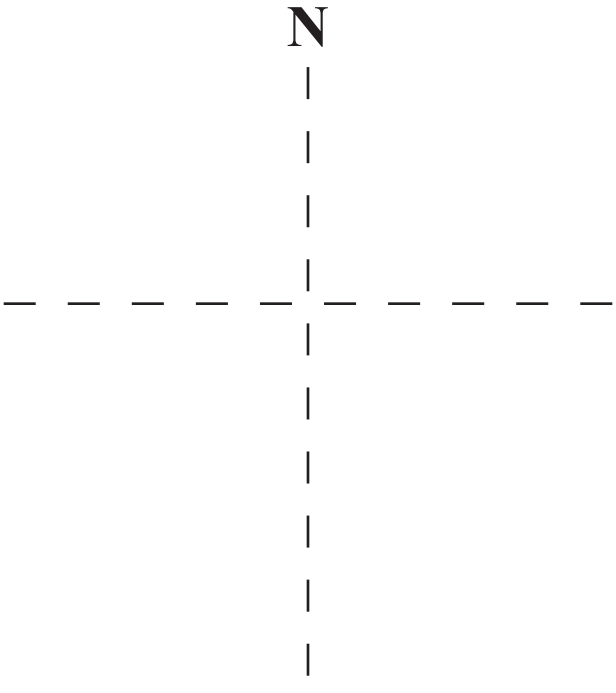

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Sprayer Calibration

Cost-effective pesticide use depends on the accuracy of application equipment & consistent delivery of a pesticide mix. This is based on how many gallons per acre (GPA) that a sprayer can apply. Without knowing GPA, you cannot accurately measure how much pesticide is needed or how much to add to a tank. There are a number of ways to calibrate spray application equipment. The procedure described here can be done with a few common tools & basic arithmetic.

Clean the Sprayer Before Calibrating

1. Remove nozzles, screens, & in-line filters. Clean them with soapy water & a soft brush. Never use a knife or wire brushes to clean nozzles. Use soft, non-metallic objects, a stream of water or compressed air.
2. Away from any wells or water supplies, partially fill the spray tank with water.
3. Start the sprayer & flush hoses & boom with plenty of water. Either collect water or redirect back into spray tank. Repeat as necessary
4. Turn sprayer off & replace nozzles. All nozzles should be the same size & type of material.
5. Restart sprayer, adjust pressure for proper field application & inspect nozzles for proper spray pattern. Replace as necessary.
6. Apply water in the tank over a site that is listed on the label just as you would when spraying for a pest.

Calibrating a Backpack or Hand Sprayer

1. Use water when calibrating.
2. Measure an 18 ½ by 18 ½ foot area.
3. Spray area with water & time how long this takes. Take note of any pressure settings & strive to make your technique consistent.
4. Spray water into a container for the same amount of time as in step # 3. Make sure that the pressure is also the same as in step # 3.
5. Measure the amount you sprayed in ounces
6. Ounces = Gallons Per Acre (GPA) applied.

Or;

1. Measure out a known area.
2. Divide known area into 43,560, (sq. ft in an acre).
3. Spray the known area and time yourself.
4. Spray into bucket for amount of time in step # 3.
5. Measure amount sprayed & convert to gallons.
6. Multiply number found in step # 5 times the number found in Step # 2.

Example: Known area is 66 by 66 feet (4356 sq. ft.) 43,560 ÷ 4356 = 10. You sprayed the area and it took you 2 minutes. You spray into a bucket for 2 minutes using same pressure. You collect 4 gallons.
4 gallons x 10 = 40 gallons per acre (GPA)

Check Nozzles for Uniform Output

1. Catch & measure the output from each nozzle for one minute. Write this information down. For example, see table below.
2. After collecting the spray from all the nozzles, add the amounts caught & divide by the number of nozzles to get the average output per nozzle.
3. If the output from any nozzle is more than 10% above or below the average, clean or replace that nozzle & recheck its output.
4. After replacing or cleaning nozzles, calculate a new average & recheck nozzles.

Nozzle Output Check - Example	
Nozzle	**Oz. collected after 60 sec.**
1	**19**
2	**20**
3	**22**
4	**23**
5	**16**
Total =	**100 ÷ 5 = 20 oz. average**

10% of 20 oz. is 2 oz. Any nozzle with output greater than 22 oz. (20 + 2) or less than 18 oz. (20 – 2) should be cleaned or replaced. In this case, nozzle 4 should probably be replaced & nozzle 5 maybe needs to be cleaned.

Calibrate a Boom Sprayer

1. Use water when calibrating & make sure nozzles are spaced according to manufacturer specifications.
2. Make sure nozzle output is roughly the same (10% error, or less, around the average)
3. Refer to the following table for the length of a calibration strip. Mark the course with flags.

Nozzle Spacing (inches)	**Course Length (feet)***
18	227
20	204
30	136
40	102
*** 340 ÷ spacing in <u>feet</u>** . Course length for a 19" spacing (1.583 feet). Example: 340 ÷ 1.583 = 215 foot course length.	

4. Drive the course in the gear and rpm you will use when actually spraying. Record time required to drive the course. Conduct this test two or three times and take the average. Accuracy and consistency are key for good calibration.
5. Park & turn on sprayer, adjust sprayer pressure & collect liquid from one nozzle equal to the time required to drive the course. Make note of this pressure & use the same pressure when spraying.
6. **Ounces** of liquid collected = Gallons Per Acre (**GPA**)

Calibrate a Broadjet Sprayer

1. Use water when calibrating.
2. Measure the width of the spray pattern (swath width of the nozzle).
3. Based on the swath width, determine the length of the calibration course using the following table.

Swath Width in Feet	Course Length (feet) *
35	156
40	136
45	121
50	109
* 5,460 ÷ by the swath width in feet. Course length for a 32 foot swath. 5460 ÷ 32 = 171 foot course length	

4. Drive the course in the gear and rpm you will use when actually spraying. Record the time required to drive this course. Conduct this test two or three times & take the average.
5. Park & turn on sprayer, adjust sprayer pressure & collect liquid from the nozzle equal to time required to drive course. Make note of this pressure & use the same pressure when spraying.
6. **Pints** of liquid collected = Gallons Per Acre (**GPA**)

Mixing the Spray Tank when Area to be Sprayed is Known

1. How many acres will you spray?

$$\frac{\text{Volume in tank}}{\text{GPA}} = \text{Acres}$$

Example: $\frac{\text{300 gallons in tank}}{\text{30 GPA}} = 10 \text{ acres}$

2. How much solution will you add to tank?

Total Solution = Acres Sprayed x GPA

Example: You want to spray 10 acres & your sprayer is calibrated at 30 GPA.

10 acres x 30 GPA = 300 gallons

3. How much pesticide will you add to the tank?

Labeled rate X acres = amount to add to tank

Example: 1 pint/acre x 10 acres = 10 pints to add to spray tank.

Determining Product to Add to Tank when Area to be Sprayed is Unknown

$$\text{Amount of Pesticide Product to add per Gallon of Solution} = \frac{\text{Product Label Recommendation (per acre)}}{\text{GPA (Gallons Per Acre)}}$$

***Example: A pesticide label calls for a rate of 1 ounce/acre. The 5 gallon backpack sprayer is calibrated at 15 GPA. You plan on using 4 gallons of solution for this application. How much pesticide product do you add to the tank?*

Step 1: 1 oz per acre / 15 GPA = **0.06 oz per gal of solution**
Step 2: 0.06 oz x 4 gal of solution = **0.24 oz total product**

Other Useful Formulas:

1. What size (flow rate) nozzles should you purchase to achieve a desired GPA?

$$GPM = \frac{GPA \times MPH \times W}{5940}$$

GPM = gallons per minute for one nozzle
W = nozzle spacing (in.) or broadjet width (in.)
MPH = field speed in miles per hour

2. What speed should you drive to achieve a particular GPA?

$$MPH = \frac{GPM \times 5940}{GPA \times W}$$

Conversions

Multiply	By	To Get
Acres	43,560	Square Feet
Cups	8	Ounces (liquid)
Cups	16	Tablespoons
Gallons	3.785	Liters
Gallons	128	Ounces
Gallons	8	Pints
Gallons	4	Quarts
Gallons	8.345	Pounds of Water
GPA	9.354	Liters Per Hectare
Miles	5,280	Feet
Miles Per Hour	88	Feet Per Minute
Ounces (dry)	0.063	Pounds
Ounces (liquid)	0.063	Pints (liquid)
Ounces (liquid)	0.031	Quarts (liquid)
Ounces (liquid)	29.573	Milliliters (ml)
Ounces (liquid)	0.02957	Liters
Ounces	2	Tablespoons
Ounces	6	Teaspoons
Pints	0.473	Liters
Pints (liquid)	16	Ounces (liquid)
Quarts	2	Pints
Quarts	0.25	Gallons
Quarts	0.946	Liters
Quarts (liquid)	32	Ounces (liquid)
Quarts (liquid)	2	Pints (liquid)
Tablespoons	3	Teaspoons
Tablespoons	0.5	Ounces (liquid)
Teaspoons	60	Drops
Teaspoons	0.33	Tablespoons
Teaspoons	0.1666	Ounces (liquid)

Montana Pesticide Education Program

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Email: ctharp@montana.edu
Web: http://www.pesticides.montana.edu

USDA Record Keeping Branch

http://www.ams.usda.gov:80/science/sdpr.htm

Montana Department of Agriculture

Phone: (406) 444-5400
Web: http://agr.mt.gov/agr/Programs/Pesticides/

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