



PURDUE PESTICIDE PROGRAMS

Purdue University Cooperative Extension Service

LAWNCARE PESTICIDE APPLICATION EQUIPMENT A Guide to Selection and Calibration of Granular Spreaders

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TABLE OF CONTENTS

PAGE

INTRODUCTION	3
FOLLOWING RECOMMENDED CULTURAL PRACTICES	5
OWNER'S MANUAL AND INSTRUCTIONS	5
THREE BASIC STEPS TO PROPER CALIBRATION	6
APPLYING GRANULAR PRODUCTS	7
DROP SPREADERS	7
ROTARY SPREADERS	13
PRACTICAL TIPS FOR HANDLING LAWNCARE PRODUCTS	18
CONCLUSION	20
ACKNOWLEDGMENTS.....	22

INTRODUCTION

Your plan is to establish and maintain a beautiful lawn, and you decide to do it by the book. You follow the recommendations of university extension educators and garden center professionals closely. In the process, you

- change old and routine practices that are commonly accepted;
- avoid advice from well-meaning, but ill-informed friends;
- purchase quality grass seed suited to your location;
- make certain your lawn receives the correct amount of water at proper intervals;
- sharpen the blade of your lawn mower frequently so that it doesn't tear the grass blades and result in brown tips;
- raise the deck on your mower to a cutting height of three inches to prevent scalping the lawn and to discourage weeds from growing;
- mow frequently so that no more than one-third of the leaf blade is removed during each cutting, thereby preventing plant stress;
- apply a quality lawn fertilizer via several fall applications rather than the traditional, single application in the spring.

These steps take more time and money than you had originally planned, but the results are nothing short of spectacular. The lush green grass and newly planted shrubs and flowers completely transform the appearance of your home and increase the value of your property. But suddenly something goes wrong.

You notice that your lawn's appearance has changed. There are brown spots in the front yard. You tug at the green grass next to the dead

brown areas and find that the sod can be lifted up like a piece of carpet, and there are large white worms in the bare soil underneath. You take some of the worms to your county extension office for identification and information on what damage they might do to your lawn. Your

extension educator immediately identifies the insects as white grubs and tells you what you don't want to hear: The grubs can destroy what you have worked so hard to accomplish. Your infestation is serious and immediate action is needed.



T. Gibb



T. Gibb

The extension educator gives you a publication on white grubs and explains what can be done to control them. It requires the use of a granular insecticide that you can obtain from a garden center. Once there, your first step is to read the safety precautions on the product label. You decide to buy new chemical-resistant gloves to replace your old, torn, cloth gloves at home. Next, you determine how much of the product you will need. The label recommends a rate based on a 1,000-square-foot area. You compute the total area of your lawn that is infested and determine how much of the product you will need to treat it.

Returning home, you pour the granular insecticide into your spreader and wage your battle against the grubs. But, unfortunately, some of the best laid plans do fail. The spreader empties long before all of the grub-infested area is treated. You wonder how this can happen when you have done everything by the book!

The problem was caused by failure to calibrate the spreader before filling it. Calibration is essential to ensure that the insecticide will be applied at the correct rate. Otherwise, as in this example, the spreader may apply too much of the product to part of the area, running out before the entire area is treated. Sure, you can go back to the store and buy more insecticide; but that is an added expense, and it may be days

RECIPE

Roast Turkey
Cook the turkey 1 hour @ 350° for every 5 lbs.

Calibration
Heat x Time

Too Little	Undercooked & Dangerous
Just Right	Nutritious & Delicious
Too Much	Overcooked & Inedible

LABEL
Use Directions:
1 bag per 5,000 square feet

Calibration
Rate x Area

Too Little	Pest Survives: Time Wasted
Just Right	Pest Controlled: Beautiful Lawn
Too Much	Product Wasted: Money Lost

before you can treat the rest of the lawn; in the meantime, grubs will continue to damage the untreated portion of the lawn. (In an opposite scenario, product remaining in the spreader after the entire area has been covered indicates that too little product has been applied, rendering it ineffective against the grubs.)

Calibration is the process of metering the amount of granules released by the spreader over a specified area. Not calibrating is analogous to placing a meal in an oven and setting the temperature randomly. The result is predictable: too high, and the food is overcooked; too low, and it's undercooked. Either way, the result is bad news!

This is important to know: *It is against the law to apply a pesticide at a rate inconsistent with the label.* In other words, it is mandatory to apply the rate recommended on the product label—not more, not less. Remember that applying more product than is recommended on the label does *not* result in better control of the pest.

Hopefully, you are now convinced that calibration is important. But if you question whether you can calibrate your equipment accurately, remember that it doesn't have to be difficult and you don't have to be a mechanic. Learning how to calibrate application equipment is like learning how to use any new tool; it is a simple, step-by-step process. Although it takes time, at first, with practice and experience the process becomes faster and easier, and your results predictable. You will be able to apply the right amount of product to protect your lawn against pests.

FOLLOWING RECOMMENDED CULTURAL PRACTICES

A prerequisite for successful pest control is to follow recommended cultural practices to ensure that your lawn and landscape plants are as healthy as they can be. Good cultural practices, combined with patience and perseverance, can improve even a bad lawn. Reliable and accurate information on the proper care of lawn and landscape plants can be obtained from county Cooperative Extension Service personnel and garden center professionals. You should study and follow their recommendations carefully; and if you feel that you cannot make such a commitment, consider hiring a lawn care professional.

OWNER'S MANUAL AND INSTRUCTIONS

New pesticide application equipment comes with the manufacturer's instructions on how to use it properly. The instructions may be found in an owner's manual, on loose-leaf papers, or printed on the equipment itself. Instructions accompanying most new application equipment will provide

- a product registration card;
- the model number of the equipment, or a place to write down this important number;
- a phone number for the manufacturer's customer relations department;
- address where a new set of instructions or an owner's manual can be obtained;
- a diagram and corresponding numbered parts list;

- instructions on how to set up and use the equipment;
- routine maintenance procedures needed to extend the life of the equipment;
- the manufacturer's warranty and related disclaimers;
- charts with proper equipment settings.

Equipment instructions are sometimes misplaced or thrown away, which is unfortunate because you may not remember all there is to know about equipment that you use infrequently. Instructions should be kept for reference when cleaning, maintaining, and calibrating the equipment.

Keep instructions in a safe place where they can be accessed easily and quickly. An example would be to maintain a reference file box for these and other home appliance and tool manuals. If instructions are printed directly on the equipment, copy them onto a piece of paper and store it in the box. These references are just as important for refreshing the memory of an experienced user as they are in getting the beginner started.

THREE BASIC STEPS TO PROPER CALIBRATION

Step 1.

Select the Proper Pesticide Product and Application Equipment

Common pesticides used to control home landscape pests include *insecticides* to control insects, *herbicides* to control weeds, and *fungicides* to control plant diseases. Fertilizer is not a pesticide because it is not used to control pests; its function is to provide essential nutrients for healthy plant growth. Sometimes one or more pesticides are mixed with fertilizer to form a combination product. This saves time and work, but *combination products must be handled as pesticides*.

Step 2.

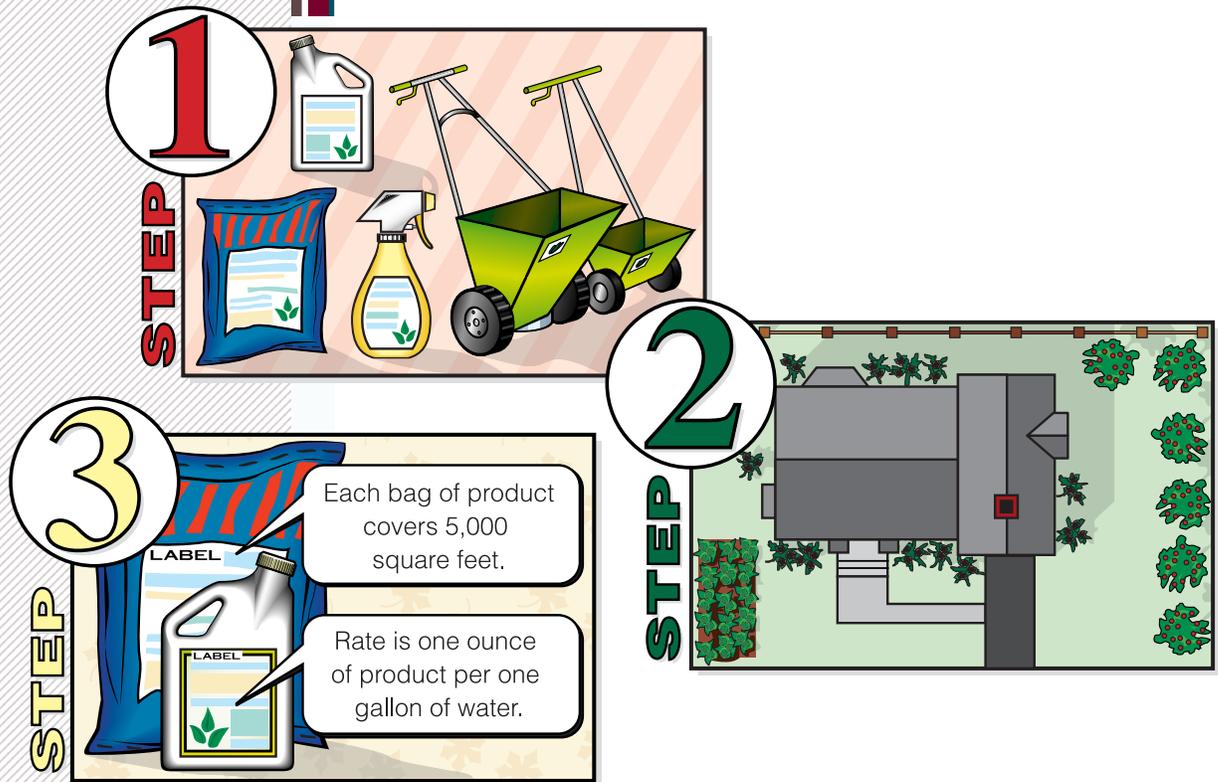
Determine the Size of the Treatment Area

The second step is to determine the total size of the area to be treated. This is a simple calculation when the shape of the area is a square or rectangle and the area does not contain objects such as a sidewalk, driveway, or plant bed: Simply multiply length times width to determine the total area to be treated.

$$\text{TOTAL AREA TO BE TREATED} = \text{LENGTH} \times \text{WIDTH}$$

But many application sites contain objects that occupy space and do not require treatment: the house, a garden shed, flowers, shrubs, ground cover, mulched areas, trees, patios, fountains, pools, sidewalks,

driveways, etc. The total space occupied by all such objects must be subtracted from the total area of the property to determine the area that actually will be treated.



Step 3.

Determine the Amount of Product Needed

The final step in calibration is to determine the application rate. The product label will state how much to apply; but it will vary, depending on product formulation and application site. In the case of a dry pesticide product for lawn application, the label usually will tell you how much of the product to apply per 100 or 1,000 square feet.

APPLYING GRANULAR PRODUCTS

Granular formulations are dry materials for distribution via a piece of equipment commonly called a spreader. There are two types: the drop spreader and the rotary spreader.

Drop Spreaders

Drop spreaders are popular with do-it-yourself applicators for applying dry fertilizers, weed and feed products, and granular insecticides to turf. The product is poured into a hopper mounted between two wheels. At the bottom of the hopper is a rotating agitator bar, driven by the movement of the wheels, which stirs the product and keeps it flowing freely and uniformly.

Drop spreaders are aptly named because the granules drop straight down between the wheels through a set of adjustable openings, collectively called the gate, in the bottom of the hopper. The amount of product that falls through the gate is governed by adjusting the openings according to the settings or numbers on the hopper's scale. Higher numerical settings correspond to larger openings and will result in more of the product being dropped.

The size of individual granules affects the rate at which they can fall through the gate openings. Switching to a new product that contains smaller or larger granules, without changing gate openings set previously for another product, can result in significantly more or less of the new product being applied.

Combination products consisting of large fertilizer granules mixed with small pesticide granules affect the delivery rate of a drop spreader significantly. Always consult the product label to determine approximate settings for calibrating your equipment.



A. Blessing



A. Blessing



Good News About Drop Spreaders

- **Drop spreaders are accurate and easy to use.** The applicator usually can see the wheel tracks from the previous pass across the area and use them as a guide, overlapping slightly to ensure uniform coverage. Sometimes it is also possible to see the product on the ground after it is dropped.
- **Precise placement is easy to achieve.** The product drops down between the wheels, preventing granules from moving off target or falling onto an area such as a sidewalk, driveway, dog kennel, goldfish pond, flower bed, street, storm sewer, pool, sand box, etc., where it isn't intended.
- **Drop spreaders are efficient in small areas.** They are easy to operate and very accurate on small lawns and narrow strips of grass in a side yard or between the street and sidewalk.

Bad News About Drop Spreaders



- **Drop spreaders leave little room for error.** There is no forgiveness when passes are not overlapped correctly. Failure to ensure that the wheel tracks overlap slightly means that some turf will remain un-

treated, and pests living in untreated strips may not be controlled. In this photograph, untreated strips lag behind the treated turf in growth, and the sweet clover thrives!



J. Becovitz

Too much overlap is even worse. Overlapping too far can burn or kill grass plants because twice the required amount of product is applied. Over-application of a product constitutes wasted product and, thus, wasted money; and you

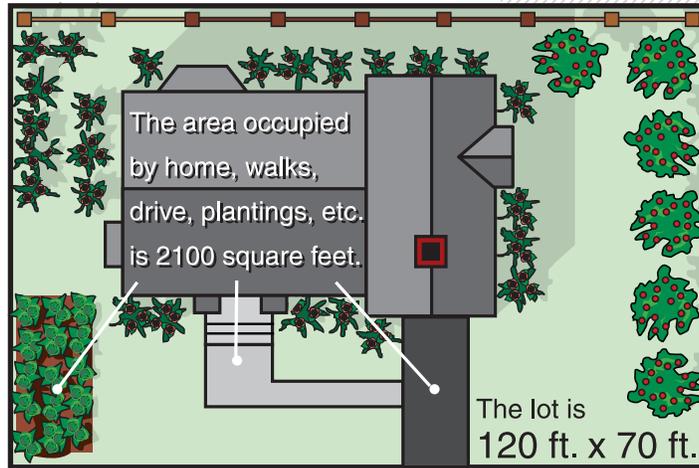
may run out of product before treating the entire area, necessitating an additional purchase.

- **Calibration is required for each different product used.** A drop spreader must be recalibrated each time a different product is used in it because granules differ in size, weight, and shape. Carrier materials in granules also can affect their flow through the spreader.
- **Corrosion can occur.** Drop spreaders must be thoroughly cleaned with water and dried properly after each use, especially when a fertilizer is used. Fertilizer products can rust metal hoppers and may render the adjustable gate openings or wheel inoperative. Lubricate all moving parts with a light oil after cleaning.
- **There is no automatic shutoff.** Granules continue to drop after the spreader stops moving. The gate openings must be closed manually—and quickly—each time the spreader is stopped. In the photograph above, note the untreated ends of strips where shutoff was premature.
- **Clogging can occur.** The gate openings can become clogged with product when the bottom of the hopper brushes against tall wet grass. Some pesticides must be applied to wet turf so that the granules will stick to the grass blades (in the case of fungicides) or to the weeds (in the case of herbicides).

Calibrating a Drop Spreader

Suppose that you want to use a drop spreader to apply a granular fertilizer to a 6,300-square-foot lawn. How much granular product will you need to do the job?

The label indicates that one 20-pound bag of fertilizer will treat 5,000 square feet of turf when the gate for your type of spreader is set at $5\frac{3}{4}$. Review the sample problem for this scenario. Then, complete the right-hand column with information on your yard and the product that you actually will use.



Option 1. Calibrating a Drop Spreader by the Multiple Pass Method

Calibration Steps	Sample Problem	Calculations
1. Measure the length and width and calculate the total square footage of the area to be treated.	120 ft x 70 ft = 8400 ft ²	
2. Calculate the total area occupied by the house, sidewalks, driveway, plantings, etc., and subtract from the total area determined in the first step.	If the total occupied area is 2100 ft ² :	$\begin{array}{r} 8400 \text{ ft}^2 \\ -2100 \text{ ft}^2 \\ \hline 6300 \text{ ft}^2 \text{ to be treated} \end{array}$
3. Read the label to determine how many square feet one bag of product will cover.	5000 ft ²	
4. Divide the number in Step 2 by the number in Step 3 to determine how many bags would be needed to treat the entire area.	6300 ÷ 5000 = 1.26 bags (about 1 1/4 bags)	
5. Set the gate lower than the 5 3/4 recommended setting given by the product label or the owner's manual for the spreader.	Set the gate at 2 1/2	
6. Place about a half of bag of product into the hopper.		
7. Push the drop spreader back and forth across the lawn until the product is gone. Fill the hopper with another half bag and repeat the treatment at right angles to the first application. Continue until 1 1/4 bags are completely used.	Make sure that the wheel tracks of each pass slightly overlap the tracks from the previous pass.	

Another approach for calibrating a drop spreader is presented as Option 2 (p. 12).

Option 2. Calibrating a Drop Spreader by the Single Pass Method

Calibration Steps	Sample Problem
1. Set the gate openings on your spreader using the product label directions; or set them so that they are slightly larger than the granules. Read the label recommended rate of application.	Gate setting = $5 \frac{3}{4}$ Label rate = 20 lb / 5,000 ft ² Or... Label rate = 4 lb / 1,000 ft ²
2. Measure the width of the bottom of the hopper between the wheels.	Length = 24 in
3. Convert the inches in Step 2 to feet by dividing by 12.	Length = 2 ft
4. Measure and mark a convenient distance on clean pavement such as a driveway; fifty feet is suggested. Ten passes back and forth along this distance will result in the release of enough product to calibrate the equipment accurately.	50 ft x 10 passes = 500 ft
5. Compute the area covered by multiplying the length of the hopper (Step 3) times the length of the area (Step 4).	2 ft x 500 ft = 1,000 ft ²
6. Weigh the amount of product that you use to fill the hopper. Turn the spreader on and push it over the test strip ten times, using a consistent walking speed. Be sure to turn the spreader off, immediately, when you reach the end of the test strip.	Put 5 lb of product into the hopper.
7. Weigh the amount of product that is left in the hopper.	1 lb left in the hopper
8. Compute the amount of product that was used to cover the test area by subtracting the leftover amount (Step 7) from the amount put into the hopper (Step 6). The result represents the amount of product applied to the 1,000-square-foot test area.	5 lb – 1 lb = 4 lb / 1,000 ft ²
9. If the amount of the product used (Step 8) is within 10 percent (high or low) of the label-recommended rate (Step 1), the spreader is calibrated correctly. If the amount of product is not between 90 and 110 percent of the labeled rate, (that is, if it is not within ± 10 percent), reset the gate openings and repeat the process.	In this case, 4 lb per 1,000 ft ² equals the label rate of 20 lb per 5,000 ft ² . So no additional adjustments are necessary.
10. Determine the area to be treated by multiplying its length times its width and subtracting the square footage of areas that will not be treated.	From Option 1, the total area to be treated = 6,300 ft ²
11. Apply the product according to label directions, using the gate setting determined in calibrating the spreader.	$6,300 \text{ ft}^2 \div 5,000 \text{ ft}^2 \text{ per bag}$ = 1.26 bags

Rotary Spreaders

Push-type rotary spreaders are gaining popularity among homeowners who treat larger yards or irregular or hilly landscapes.

Gravity causes granules to drop through an adjustable gate opening (or openings) in the bottom of the hopper onto a spinning plate activated by the turning wheel axle as the spreader is pushed across the treatment area. The spinning plate slings the granules 8–12 feet out in front of the equipment in a semicircular arc.



A. Blessing



A. Blessing



A. Blessing

Smaller, hand held rotary spreaders are available for use in smaller areas; they have a crank that is turned by hand to throw the granules outward.

As with the drop spreader, the openings on rotary equipment can be set by selecting the appropriate number (or letter). Read the product label or your equipment manual to determine the initial settings to use in calibrating the spreader.

Rotary spreaders do not distribute granules uniformly because of the tapered, fan-shaped pattern created by the spinning plate. More of the product is distributed in the center of the arc than on either side. This uneven distribution requires that you overlap each pass by 30–50 percent as you move back and forth across the site, thus throwing additional granules onto the outer edge of the previous pass.

It is important to read the product label, or the spreader instruction manual, for instructions on how to determine the amount of overlap required. If that information is not provided, space the passes far enough apart so that the outside edge of the distribution arc just touches the wheel tracks made during the previous pass. Overlapping each pass in this manner will ensure uniform, complete coverage.



Good News About Rotary Spreaders

- **Rotary spreaders save time.** They dispense the product over a wider swath, per pass, than drop spreaders, allowing quicker treatment of the total area.
- **Low maintenance is required.** Most rotary spreaders are manufactured primarily from plastic parts, which eliminates rust problems. They are easy to clean with a hose after each use. Be sure to lubricate any metal parts with a light oil, after cleaning.
- **Rotary spreaders are compatible with many products.** They permit the use of many different products, including some that have large granules.

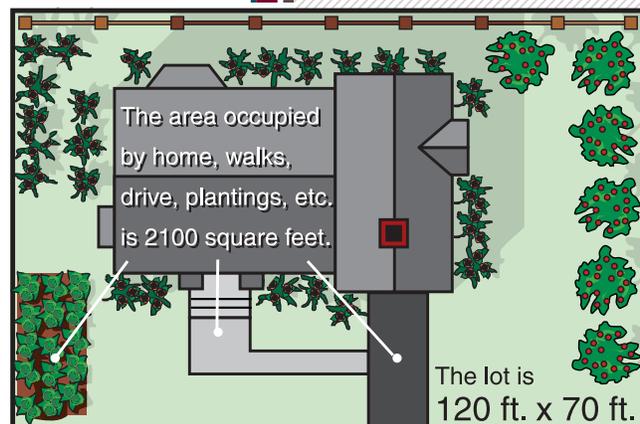


Bad News About Rotary Spreaders

- **Uneven distribution is a problem with combination products.** Small, light particles tend to fall to the ground close to the spreader, while larger, heavier ones are thrown farther out. Products that contain a mixture of large fertilizer granules and small pesticide granules, for instance, may be difficult to disperse evenly.
- **Uniform coverage may be more difficult to achieve than with drop spreaders.** Proper overlap is essential. It is important to overlap the right amount on each pass, and to do so consistently.
- **Off-target placement can be a problem.** When operating a rotary spreader, you must prevent the product from being thrown onto areas where it should not be applied: sidewalks, driveways, patios, play areas, sensitive landscape plants, gardens, etc. In addition to managing the swath pattern, you must be aware of cross winds that could possibly blow granules off-target.

Calibrating a Rotary Spreader

Suppose that you are using a rotary spreader to apply a granular fertilizer to a 6,300-square-foot lawn. The label indicates that one 20-pound bag will cover 3,500 square feet of turf when the gate for your rotary spreader is set at 5. Review the sample problem for this scenario. Then, complete the shaded column with information on your yard and the product you actually will use.



Option 1. Calibrating a Rotary Spreader Using the Multiple Pass Method

Calibration Steps	Sample Problem	Calculations
1. Multiply the length and width of the area to be treated to determine the total square footage.	120 ft x 70 ft = 8400 ft ²	
2. Calculate the total area occupied by the house, sidewalks, driveway, plantings, etc., and subtract from the total area determined in Step 1.	$\begin{array}{r} 8400 \text{ ft}^2 \\ - 2100 \text{ ft}^2 \\ \hline 6300 \text{ ft}^2 \end{array}$	
3. Determine how many square feet one bag of product will cover, as stated on the label.	3500 ft ²	
4. Divide the number in Step 2 by the number in Step 3 to determine how many bags will be needed to treat the entire area.	$6300 \div 3500 = 1.8$ (about 1 3/4 bags)	
5. Use a gate setting that is smaller than the setting recommended by the product label or the owner's guide.	Set the gate at 3.	
6. Place half a bag of product into the hopper.		
7. Push the rotary spreader back and forth across the lawn until the product is gone. Fill the hopper with another half bag and repeat the treatment at right angles to the first application. Repeat the process until 1 3/4 bags are completely used.	Make sure that the edge of the distribution pattern touches the wheel tracks from the previous pass to ensure proper coverage.	

Another approach for calibrating a rotary spreader is presented as Option 2 (pp. 16–17).

Option 2. Calibrating a Rotary Spreader Using the Single Pass Method

Calibration Steps	Sample Problem	Calculations
<p>1. Consult the equipment manual to determine the swath width. Read the product label for the application rate and gate setting.</p>	<p>Swath width = 10 ft Rate = 20 lb per 3,500 ft² Gate setting = 5</p>	
<p>2. Measure and mark a convenient distance on clean pavement for a test strip. Suggestion: Use 100 feet or another distance that can be divided easily into 1,000 square feet.</p>	<p>Test strip = 100 ft</p>	
<p>3. Multiply the swath width (Step 1) by the length of the test strip (Step 2) to determine the area that will be covered in the test run.</p>	<p>10 ft x 100 ft = 1,000 ft²</p>	
<p>4. Weight the amount of product that you put in the hopper. Turn the spreader on and push it down the test strip, using a consistent walking speed. Be sure to turn the spreader off immediately at the end of the test strip.</p>	<p>Weight of product put in the hopper = 8 lb</p>	
<p>5. Weigh the amount of product left in the hopper after treating the test area.</p>	<p>2 lb left in the hopper</p>	
<p>6. Subtract the amount left in the hopper (Step 5) from the amount put into the hopper (Step 4) to determine the amount used over the test area.</p>	<p>8 lb – 2 lb = 6 lb to cover 1,000 ft²</p>	

(continued)

Calibration Steps**Sample Problem****Calculations**

7. If the amount of the product that is used (Step 6) is within 10 percent (plus or minus) of the recommended rate on the product's label, the spreader is calibrated correctly. If the amount of product is greater or less than 10 percent of the recommended rate, repeat the steps above to recalibrate the spreader.
8. Calculate the total area to be treated by multiplying length times width. Calculate the square footage of areas occupied by the house, sidewalks, driveway, plantings, etc., and subtract from the total area.
9. Compute the square footage that one bag of the product will cover, using the rate on the label.
10. Compute the number of bags that will be needed.
11. Sweep up the granules from the test area and put them in the hopper.
12. Apply the product according to label directions, using the gate setting determined in calibrating the spreader.

In this case, 5 3/4 pounds per 1,000 square feet would equal the label rate of 20 pounds per 3,500 square feet. 6 pounds of product was applied per 1,000 square feet in the calibration run. This is within 10% of the recommended rate. No additional adjustments are necessary.

$$\begin{array}{r} 8400 \text{ ft}^2 \\ - 2100 \text{ ft}^2 \\ \hline 6300 \text{ ft}^2 \end{array}$$

$$\begin{array}{l} 6 \text{ lb will cover } 1,000 \text{ ft}^2 \\ \text{One bag} = 20 \text{ pounds} \\ 20 \div 6 = 3.333 \\ 3.333 \times 1,000 = 3333 \text{ ft}^2/\text{bag} \end{array}$$

$$\begin{array}{l} 6,300 \text{ ft}^2 \div 3333 \text{ ft}^2 / \text{bag} = \\ 1.89 \\ \text{(about } 1 \frac{3}{4} \text{ bags)} \end{array}$$

PRACTICAL TIPS FOR HANDLING LAWCARE PRODUCTS

- Always clean equipment and clothing after measuring, mixing, and applying pesticides: the spreader; all containers used in measuring or calibrating; personal clothing; protective clothing such as gloves and pesticide-resistant pants. Maintain and store application equipment according to the manufacturer's instructions. Generally, equipment should be washed and dried, then stored in a dirt- and dust-free location, out of sunlight. The storage area should not be subject to extreme temperatures.
- Rinse equipment over the area treated or a similar labeled site. Never rinse over concrete or pavement because runoff from these surfaces might result in pesticide residues entering drains or sewers.
- You can measure an area quickly and easily if you know the length of your normal stride. Walk in a straight line and count the number of steps you take. Measure the length of the distance you walked, and divide it by the number of steps you took. The result is the length of your stride.

Example: You take 25 steps and cover 75 feet.

$$75 \text{ ft} \div 25 \text{ steps} = 3 \text{ ft}$$

So the length of your stride is 3 feet.

Next, walk the length and width of the area to be treated, counting the number of steps each way. Multiply the number of steps by the length of your stride.

Example: You take 37 steps walking the length of the area; you walk 22 steps on the width.

$$37 \text{ ft} \times 3 \text{ ft} = 111 \text{ ft (length)}$$

$$22 \text{ ft} \times 3 \text{ ft} = 66 \text{ ft (width)}$$

Multiply length times width to get the total area:

$$111 \text{ ft} \times 66 \text{ ft} = 7,326 \text{ ft}^2$$

- Always wear the right kind of protective gloves (see product label) when handling a pesticide or a combination product that contains fertilizer *and* pesticide.

- Before calibrating a spreader on a hard surface such as concrete or pavement, sweep the surface to remove debris such as sand and gravel. *Use a broom that is used outdoors only.* After applying the product in the test run, sweep up the granules with the outdoor broom and include them as part of the mixture that goes into the hopper.
- Granular fertilizers and pesticides (and products containing both) absorb moisture from the air and form clumps that are difficult to break up; this makes storage of leftover granules for use at a later time very important.

Following application, put leftover granules back into their original bag. Fold over the cut end of the bag a few times and tape it closed. Place the entire bag inside a plastic bag and close it with a twist tie. If the outer bag is opaque, label the outside of the plastic bag with the brand name of the product and approximately how much is in the bag. If you have an empty bag with the name of the product on it, cut the name out and attach it to the plastic bag.

- Keep accurate records. After calibrating equipment for a specific product and area, record gate settings, name of product, amount of product, etc., for future reference; place the record in a file box along with the equipment manual.
 - Common sense is good sense—and gardeners need lots of it! Never, never, never over-apply a pesticide product!
 - If you are unsure about applying pesticides, or if you lack the time and equipment to do it properly, consider hiring a professional applicator.
-

CONCLUSION

We take great pride in beautiful landscapes that compliment our homes and increase the value of our property. A lush green lawn, large shade trees, thriving shrubs, and beautiful flowers enhance our quality of life.

Landscape plants and turf must be cared for properly to maintain their beauty and to protect our investment. As homeowners, we must become knowledgeable of the needs of turf and ornamental plants and implement cultural practices to keep them healthy.

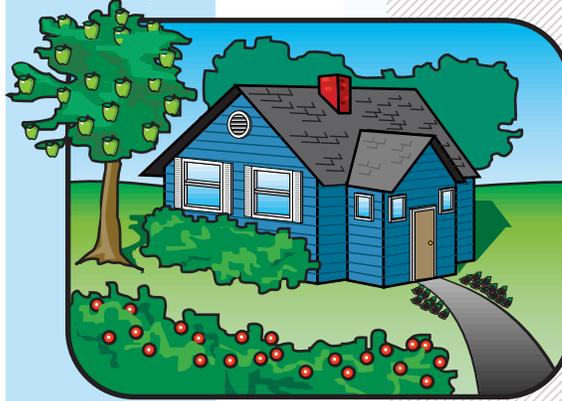
Some of us have an inherent desire to interact with the plants in our landscape and strive to learn all we can about them. We enjoy reading about them and applying what we learn, and we maintain them ourselves. We derive great pleasure and satisfaction from gardening.

Other homeowners are not interested in gardening but are very much interested in surrounding themselves with the beauty of a manicured landscape. They hire professional service firms to install and maintain their plantings, and they derive the same pleasure and satisfaction from the beauty of their property as the do-it-yourselfers.

Prevention is always the best approach to pest control, and sound cultural practices can go a long way in maintaining a beautiful, pest-free landscape. But sometimes our best laid plans just aren't enough, and pests manage to get the upper hand. If they present an immediate threat or have the potential to permanently damage or kill valuable plantings, it may be necessary to use chemical control.

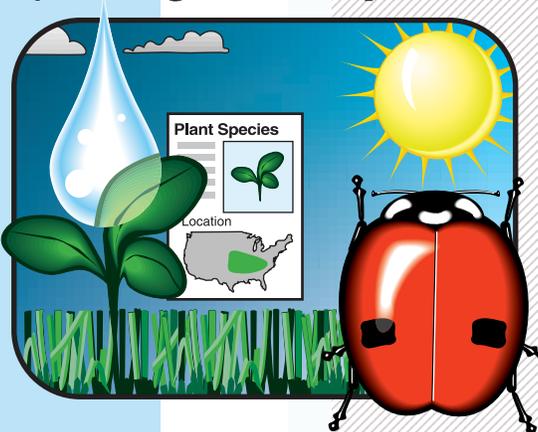
GOAL

A healthy and attractive landscape



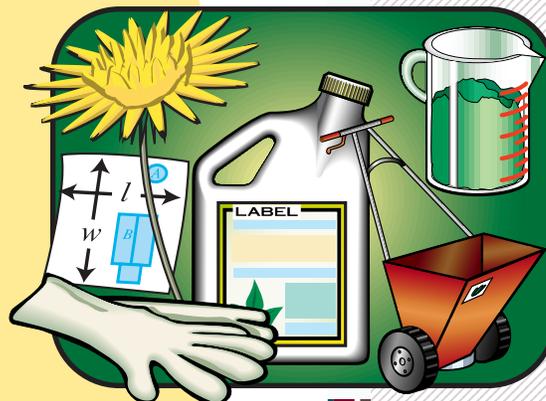
FIRST

Always follow good cultural practices



THEN

If needed, apply pesticides accurately



Remember that the responsible use of pesticides requires commitment: to yourself, to your neighbors, and to the environment. Perform these important steps when determining just what is necessary to control the pest:

1. Be sure that the pest has been positively identified.
2. Select a product labeled for control of the pest on the site where it is a problem.
3. Buy only the amount required for the application so that you will not have to store leftover product.
4. Read the label carefully and understand how to mix and apply the product safely and effectively.
5. Obtain and wear required safety clothing.
6. Select the proper application equipment for the job, and calibrate it accurately.
7. Prepare just enough pesticide to complete the job.
8. Apply the pesticide product in the safest manner possible.
9. Clean, store, and maintain application equipment according to the manufacturer's instructions.

These steps may appear complicated to the first-time pesticide user. However, they are straightforward and easy to master with a little study and experience. There is no simple recipe for safe pest control.

Calibration of pesticide application equipment is an important step in pest control. Other publications in this series discuss safe and effective pest control for the home landscape. Consult these web sites for additional information: www.btny.purdue.edu/PPP/ and www.agry.purdue.edu/agronomy/turf/turf.html.

Pesticides (and fertilizers) must be applied in a safe manner to minimize risk to the user, the environment, and the landscape; and it is equally important that they be applied accurately to maximize benefits and minimize cost. The proper calibration of application equipment is a critical component of responsible pesticide application.

The term 'calibrate' simply means to figure out how much product to put in your application equipment in order to apply a prescribed amount of pesticide—no more, no less—over a premeasured area. Learning to use and adjust pesticide application equipment is worth the time and effort required. Your reward is a beautiful, healthy landscape—and the good feeling that comes with acting responsibly.

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