NOVA SCOTIA ENVIRONMENTAL FARM PLAN

fact sheet

Applying PRONONE® 10G With an Earthway Ev-N-Spred® Crank Spreader

Introduction

PRONONE® 10G is a granular form of hexazinone, used for the selective control of woody and herbaceous weeds in lowbush blueberries and woodland management areas. It can be an effective tool in situations with many obstacles, rough terrain or in fields where early traffic is an issue.

PRONONE® 10G can be applied with a tractor mounted fertilizer spreader, a crank spreader, or a backpack air-blast. The amount applied and distribution is critical due to the low application rates, while uniform distribution on rough terrain is difficult providing challenges for tractor mounted equipment. Crank spreaders or backpack air-blast equipment can be used in obtaining the necessary coverage in these cases.

This fact sheet describes the use of a flow control plate to modify a model 3100 Earthway Ev-N-Spred® Crank Spreader to regulate PRONONE® 10G application rates. The spreader typically produces a 3.7 m (12 ft) swath when maintaining a hand cranking speed of 1 revolution per second. Faster cranking speeds will increase swath width and flow rates. A walking speed of 2.2 km/h (2 ft/sec) is comfortable in rough terrain, resulting in coverage of 0.8 ha (2 acres) per productive hour. Faster walking speeds may be used where suitable, however application rate should be recalculated.

Flow Control Plate Construction

Material: 6 inch square or circular rust resistant sheet metal (20-24 gauge) or sheet plastic, Template Guide (Figure 4).

Tools: drill bits, centre punch, shears, file

Method:

1. Tape template guide to sheet material.
2. Mark hole location with centre punch.
3. Select flow hole sizes to meet desired application rates from Figure 2.
4. Plate should be clamped and carefully drill holes in pairs as indicated on guide.
5. Cut out flow plate and file off burrs.
6. Label hole sizes on bottom of plate.
7. Install according to directions in Flow Control Plate Installation (Fig. 1).

Flow Control Plate Installation

The Flow Control Plate is secured to the bottom of the hopper to regulate flow (Figure 1).

1. From Figure 1, select hole size according to desired application rate.
2. Remove agitation wire from the post in the hopper.
3. Position the flow control plate in the bottom of the hopper so that the two matching hole sizes are over the leading (oval shaped) and rear (tear dropped shaped) flow slots in the spreader. Make sure the flow plate is right side up, otherwise alignment will be incorrect.
4. Secure Flow Control Plate in place with one half inch screw positioned through the screw hole in the right front corner of the flow control.
5. Replace agitation wire in bottom hole on post. This is essential for proper flow.
6. Flow rates are adjusted by selecting new hole sizes from Flow Control Plate.

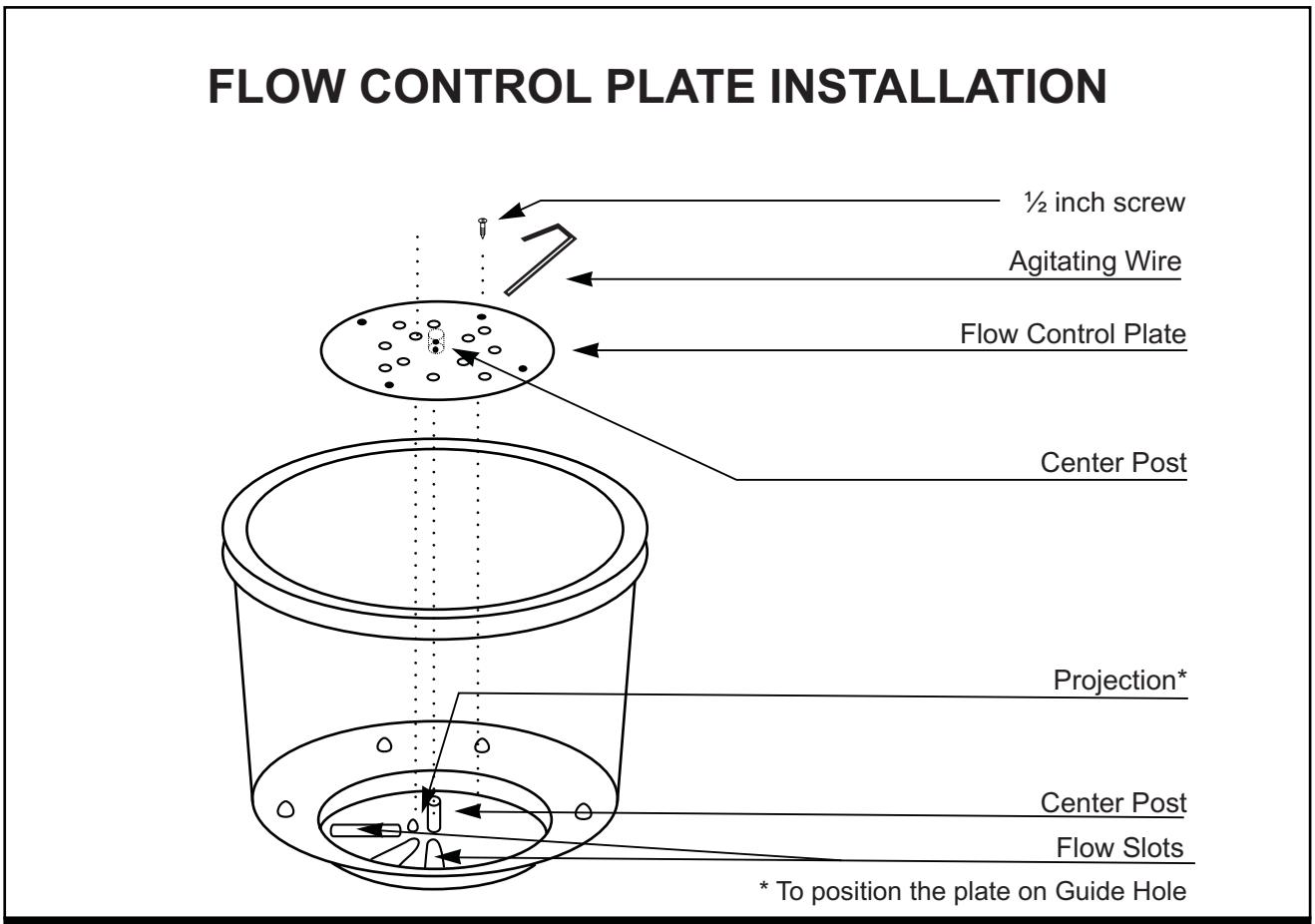


Figure 1. Exploded diagram illustrating installation of flow control plate.

Application Technique

At the 2 ft/s walking speed, the 3.7 m (12 ft) swath width will cover 0.8 ha (2 acres) per productive hour. Practice application technique with blanks and make swath width measurements at the same time.

1. Loading: Fill the hopper up to half full. Overfilling may make cranking difficult.
2. Machine Setting: Fully open the leading (oval shaped) and the rear (tear drop shaped) flow slots.
3. Walking Speed: Select a flow control plate hole size corresponding to desired application rate. A pace of 1 step per second synchronizes with crank speed. Adjust travel speed by increasing or decreasing stride length.
4. Cranking Speed: Turn crank 1 revolution/sec.
5. Swath Width: Swath width is typically 3.7 m (12 ft) at 1 revolution/sec. This may vary for different operators and should be measured as described in Swath Width Calculation section.
6. Swath Marking: Range poles should be used to mark the end of a pass. These should match the swath width, enabling them to measure the distance to the next pass.
7. Practice: Practice the 1 second operating rhythm to achieve consistent results.

Application Rate Calibration

Application rates are regulated by paired holes on the flow control plates. Figure 2 can be used as a guideline to select a flow control plate hole size, but should not substitute calibration. The rate calculations are based on a 3.7 m swath; therefore, adjust the application rate using the calculation in step 5 if swath widths vary.

Important: Flow rates may vary with different spreaders and operators. They are also very sensitive to slight variations in hole diameters in the flow control plate. To obtain precise application rates individual calibrations should be made at several settings using the following method:

1. Load hopper half full with PRONONE® 10G. Do not use blanks, they yield different flow rates.
2. At 1 revolution/sec crank speed, apply chemical into collection bag for 30 seconds. Do not obstruct impeller.
3. Weigh output in grams (or imp. fl. oz.), divide by 30 to determine the flow rate. Repeat 3 times for average.
4. Calculate application rate using the following:
   a. kg/ha=grams/sec x 4.5; or
   b. lbs/ac= imp. fl. oz./sec x 110
5. These calculations apply to a 3.7 m (12 ft) swath. If the swath width differs:

<u>Adjusted Application Rate</u>
Application Rate x 3.7 m / measured swath (m)

Although less accurate, measuring cups may be more convenient than weigh scales. Assuming an average product density of 38 lbs/ft^3 (MSDS reports 35-40 lbs/ft^3):

A) lbs/ac = imp. fl. oz./sec x 70
B) kg/ha = ml/sec x 2.7

Swath Width Calculation

Swath width should be determined. If a typical 3.7 m (12 ft) swath is not produced, the application rate should be adjusted using step 5 in the Application Rate Calibration section. This method provides an accurate means of determining swath width allowing for overlap. Use blanks, available from supplier, and avoid windy conditions when testing.

Using Figure 3, and enough cardboard boxes of equal size (1-1.5 ft wide) to stretch end to end a distance of 5 m (16 ft). Boxes should be 1 ft deep. Shallow boxes will allow pellets to bounce out while deeper boxes will obstruct pellets from reaching their maximum distance.

1. Set boxes in a line, perpendicular to direction of travel, with a small space in the centre to walk through.
2. Using the application technique start applying pellets 5 m before the boxes and pass through the line of boxes before stopping.
3. Count the number of pellets in the four central boxes and calculate the average/box.
4. Count pellets in the outer boxes. The swath edge is located at the centre of the box where the pellet count decreases and remains below half the central box average. The swath width is the distance between the two swath edges.
5. Repeat several times to get average, always traveling in the same direction.

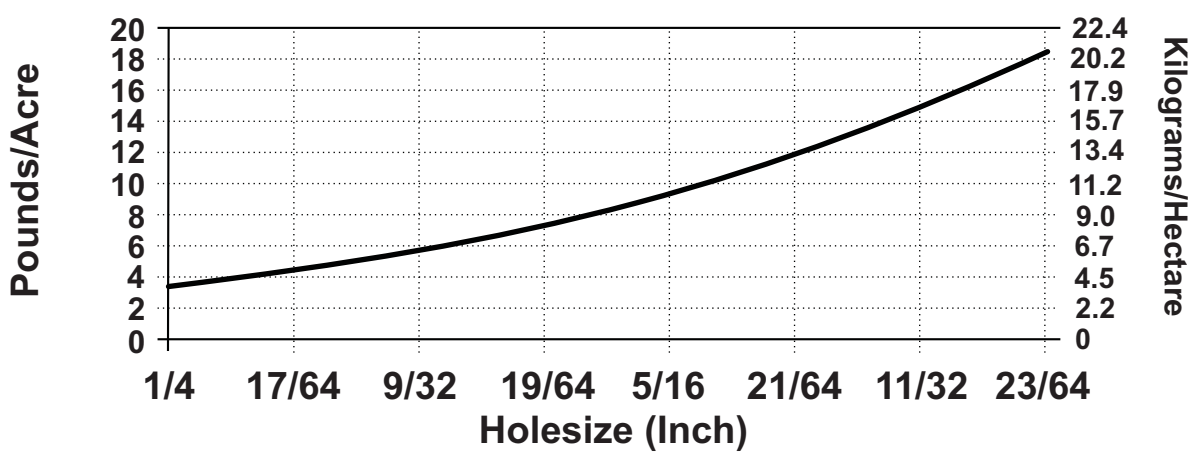
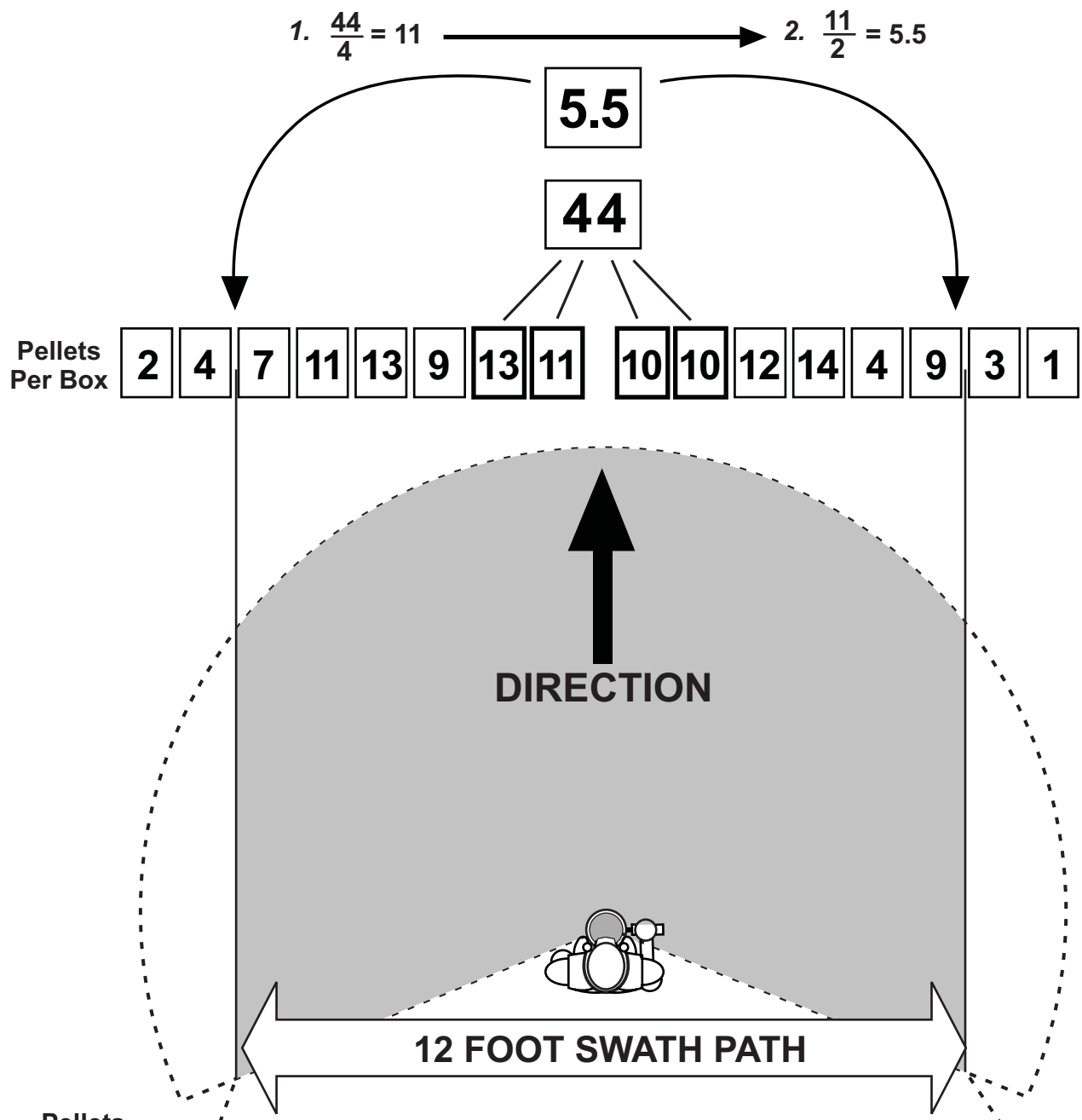


Figure 2. Application rate by hole size at 2.0 ft/s walking speed.

SWATH WIDTH CALCULATION



Pellets Per Box																
Example	2	4	7	11	13	9	13	11	10	10	12	14	4	9	3	1
Run Number 1																
2																
3																
4																
5																
6																
7																
8																
Total																
Average																

Figure 3. Method for using collection boxes to determine effective swath width (sample tally sheet at bottom).

FLOW CONTROL TEMPLATE
(To Scale)

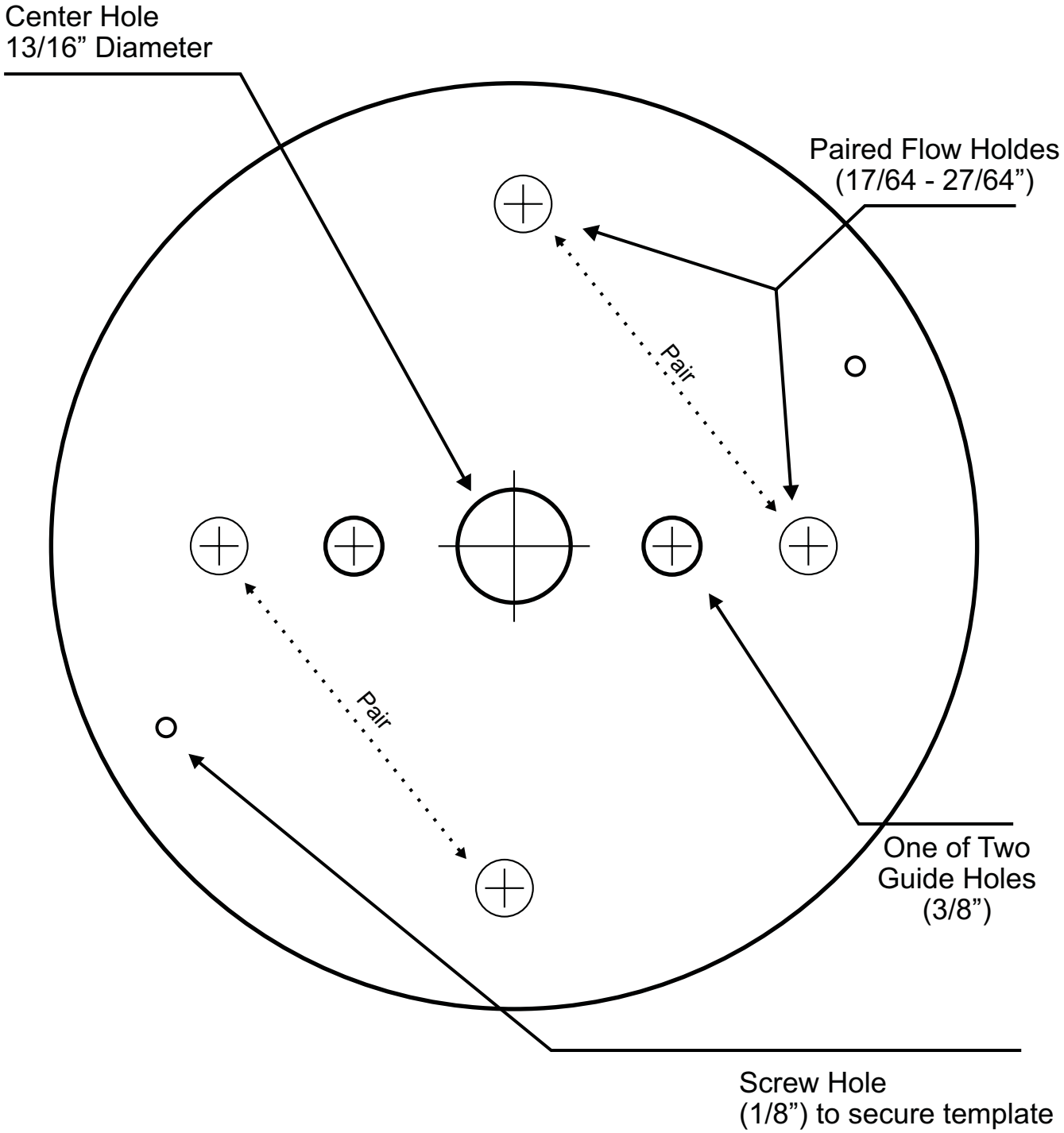


Figure 4. Template Guide for the construction of a flow control plate.
IMPORTANT: Center Hole at indicated cross.

NOTES

This fact sheet was produced with the assistance of the Nova Scotia Department of Natural Resources from Forest Research Report No. 55: Use of a 'Flow Control Plate" to Modify an Earthway Ev-N-Spred® Crank Spreader for the Application of Ponone® 10G Granular Herbicide.

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