Calibrating Forage Seeding Equipment

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Planting forages by seeds often requires precision planting equipment and precise seeding rates to successfully establish the forage stand. Calibration charts can be found on most equipment, and the charts are useful as guides for making an initial setting. However, because of variations in seed size, purity, moisture content, equipment performance, ground speed, and other factors, it is recommended to calibrate equipment periodically. Settings on charts frequently are in error by as much as 50% because these variations are not considered.

There are three calibrating methods for determining the rate of seed being applied per acre. Method 1 entails collecting and weighing the seed delivered from each seed-box opening while pulling the drill at a set speed over a determined distance. Necessary information for this method includes drill width, distance traveled, and weight of seed collected. Method 2 is similar to Method 1, except that Method 2 is carried out by turning the drive wheel. Method 3 entails counting the seed dropped per foot of row. Necessary information includes the number of seeds per pound and the number of seeds required per acre. Step-by-step instructions for each of these methods are provided in the following paragraphs.

METHOD 1. DRIVE AND COLLECT SEEDS (FOR DRILLS)

Step 1. Fasten a container or a plastic bag to each seed-box opening and collect seeds while traveling a measured distance. Pull drill at a set field speed.

Step 2. Weigh the seeds (454 grams = 1 pound).

Step 3. Measure width of drill. (Number of drill rows x distance between rows).

Step 4. To calculate seeding rate/acre:

a) determine soil area covered during the collection “run” (distance traveled (ft) x drill width (ft));

b) seeding rate can then be determined by lb/acre = (43,560 ÷ area of collection run) x pounds of seed collected.

Example: If 0.5 pound of seed is collected from an 8-foot drill pulled 100 feet, the seeding rate would be:

\[ \text{lb/acre} = \left( \frac{43,560}{8 \times 100} \right) \times 0.5 = 27.22 \]
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METHOD 2. WHEEL TURN AND CATCH

This method can be used to calibrate equipment in the shop before going to the field.

Step 1. Measure the circumference of the drive wheel or the distance it travels during one revolution. Circumference = diameter of a circle x 3.1416. (Or you can measure circumference directly with a tape.)

Step 2. Determine the number of revolutions to turn the wheel if you wanted to collect seed from 0.1 acre.

\[
\text{Number of revolutions} = \frac{43,560}{\text{drill width}} \div 10 \div \text{wheel circumference}
\]

EXAMPLE: 8-foot drill width and a wheel circumference of 7 feet would require 77.8 revolutions to = 0.1 acre.

\[
43,560 \div 8 = 5,445 \\
5,445 \div 10 = 544.5 \\
544.5 \div 7 = 77.8
\]

Step 3. Put seed in the drill and elevate the drill wheel so it can be turned by hand when the drill is engaged.

Step 4. Collect seeds from each opening while turning the wheel the required number of revolutions (77.8 in this example).

Step 5. Calculations: seed weight (lb) x 10 = lb/acre

METHOD 3. COUNT SEEDS IN FOOT ROW

For this method, you must know the number of seeds per pound and desired rate per acre in pounds. Use Table 1 to estimate seed density at various row widths and seeding flow rates. The values are not adjusted for purity or viability (pure, live seeds).

Step 1. Lay a canvas on level ground or drop seeds onto pavement, clean driveway, or other surface where seeds can be easily seen for counting.

Step 2. Pull the drill over the sample area at field speed with seed dropping so that each row can be distinguished.

Step 3. Record the number of seeds per foot in each row. If the number varies more than 25%, consider adjusting delivery for that row.

Step 4. Determine seeding density (seed/ft²) with this equation: (seed/ft of row x 12 ÷ row width(inches)) (Using Table 1). Then check seed charts showing number of seeds per pound.

For example, assume you are seeding clover that has 800,000 seeds per pound, that your drill row width is 7 inches (See Table 1), and that you counted an average of 23.3 seeds/ft of row (count several rows and calculate average).

\[
23.3 \times 12 = 279.6 \div 7 = 40 = \text{seed density (seed/ft}^2) \text{) (Table 1).}
\]

\[
40 \times 43,560 \text{ (square feet in one acre) = 1,742,400 = total seed seeded per acre.}
\]

\[
1,742,400 \div 800,000 = 2.18 = \text{pounds of clover seeded per acre.}
\]

Table 1. Seeds per foot of row needed to achieve certain seed densities (15–60 seeds/ft²) from drills with various row widths.¹

<table>
<thead>
<tr>
<th>Drill row width (in)</th>
<th>15</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed density (seeds/ft²)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seeds/running foot of row</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7.5</td>
<td>10.0</td>
<td>15.0</td>
<td>20.0</td>
<td>25.5</td>
<td>30.0</td>
</tr>
<tr>
<td>7</td>
<td>8.8</td>
<td>11.7</td>
<td>17.5</td>
<td>23.3</td>
<td>29.2</td>
<td>35.0</td>
</tr>
<tr>
<td>8</td>
<td>10.0</td>
<td>13.3</td>
<td>20.0</td>
<td>26.6</td>
<td>33.3</td>
<td>40.0</td>
</tr>
<tr>
<td>9</td>
<td>11.2</td>
<td>15.0</td>
<td>22.5</td>
<td>30.0</td>
<td>37.5</td>
<td>45.0</td>
</tr>
<tr>
<td>10</td>
<td>12.5</td>
<td>16.7</td>
<td>25.0</td>
<td>33.3</td>
<td>41.7</td>
<td>50.0</td>
</tr>
</tbody>
</table>

¹ Seed density = (seeds/ft of row x 12) ÷ row width (inches). After calculating density, you must know the number of seed per pound to calculate the rate.