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Range Management Fact Sheet

DRILL CALIBRATION

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Seeding drills require calibration to ensure the highest chance of success in any seeding! If you do not calibrate your drill, you can lose the money you have invested, either by overseeding some areas or not placing enough seed on the site. Even though you may have set the drill to seed at the desired rate, it is important to calibrate the drill to ensure proper seeding rate. Seed size, seed weight, mixture, dryness, degree of processing, and amount of trash present are factors that can cause inconsistencies between the rate the drill is set at and the actual rate.

Drills can be calibrated both in the shop and in the field. Following are the methods for both.

DRILL CALIBRATION – IN THE SHOP

Supplies needed:

Seed you will be planting
Sack/Bag for collecting seed
Scale to measure vegetation in pounds

1. DETERMINE THE DESIRED SEEDING RATE USING THE CURRENT LOT OF SEED

Using the current seed lot, determine the pounds per acre of bulk seed that is needed.

$$\text{Bulk seed of current lot needed (lbs/ac)} = \frac{\text{Desired rate of seed in PLS (lbs/ac)}}{\text{\% PLS of current seed lot}}$$

2. SET DRILL:

Set the drill to the seeding rate desired.

3. COLLECT ACTUAL SEEDING RATE OF DRILL

Jack the driving wheel of the drill up, turn 20 revolutions, catching the seed from 1 run of the seed drill in the bag or sack. Weigh sack to determine pounds of seed collected.

4. DETERMINE WHEEL CIRCUMFERENCE

Circumference is the measurement around the outside of the tire in feet. This is easily accomplished by measuring the circumference of the wheel with a tape measure.
*** Remember it needs to be in feet!

5. DETERMINE STRIP LENGTH:

Strip length (in shop) = 1.1(No. of revolutions X wheel circumference (ft))

NOTE: The 1.1 is to compensate for wheel slippage in the field.

6. DETERMINE CURRENT SEEDING RATE:

Now determine the current seeding rate of the drill:

$$\text{Seeding rate in bulk seed (lbs/ac)} = \frac{43560\ ft^2/ac \times \text{lbs seed collected}}{\text{Drill width (ft)} \times \text{Strip Length (ft)}}$$

Plug the numbers already determined in the above steps into the equation. If both sides of the equation are equal, the drill is calibrated. If the numbers on either side of the equation are not equal, the drill needs to be adjusted and the process repeated until the drill is calibrated.
(From Chapman and Carter, 1976)

EXAMPLE:

A seed mixture needs to be planted at a rate of 15 lbs PLS per acre. Your current seed lot has a PLS of 82%. After jacking up the driving wheel and turning for 20 revolutions, 1.2 lbs of seed were collected. The drill is 15 feet wide and the tire circumference is 6 ft.

Step 1 - Determine the desired seeding rate using the current lot of seed:

$$\text{Bulk seed of current lot needed (lbs/ac)} = \frac{\text{Desired rate of seed in PLS (lbs/ac)}}{\text{\% PLS of current seed lot}}$$

$$\text{Bulk seed of current lot needed (lbs/ac)} = \frac{15\ lbs/ac\ PLS\ needed}{82\%\ PLS}$$

$$\text{Bulk seed of current lot needed (lbs/ac)} = 18.3\ lbs/ac$$

Steps 2 through 4: Completed

Step 5 - Determine strip length:

Strip length (in shop) = 1.1(No. of revolutions X wheel circumference (ft))

Strip length (in shop) = 1.1(20 revolutions X 6 ft)

Strip length (in shop) = 1.1(120 ft)

Strip length (in shop) = 132 ft.

Step 6 – Determine Current Seeding Rate:

$$\text{Seeding rate (lbs/ac)} = \frac{43560 \text{ X lbs seed collected}}{\text{Drill width (ft) X Strip Length (ft)}}$$

$$18.3 \text{ lbs/ac} = \frac{43560 \text{ ft}^2\text{/ac X 1.2 lbs seed collected}}{(15 \text{ ft X } 132 \text{ ft})}$$

$$18.3 \text{ lbs/ac} = \frac{52272 \text{ lbs}}{1980}$$

$$18.3 \text{ lbs/ac} = 26.4 \text{ lbs/ac}$$

Because the equation was not equal, and the drill was putting out 8.1 lbs/ac too much, the drill needs to be set lower and recalibrated until the equation is equal.

DRILL CALIBRATION – IN THE FIELD

Supplies needed:

1. Seed you will be planting
2. Sack/Bag for collecting seed
3. Scale to measure weight in pounds

1. DETERMINE THE DESIRED SEEDING RATE USING THE CURRENT LOT OF SEED

Using the current seed lot, determine the pounds per acre of bulk seed that is needed.

$$\text{Bulk seed of current lot needed (lbs/ac)} = \frac{\text{Desired rate of seed in PLS (lbs/ac)}}{\text{\% PLS of current seed lot}}$$

2. SET DRILL:

Set the drill to the seeding rate desired.

3. COLLECT ACTUAL SEEDING RATE OF DRILL

Drive the tractor with drill 100 ft, collecting seed from one run. Weigh the amount of seed collected.

4. DETERMINE STRIP LENGTH:

Strip length (in field) = The distance driven to collect seed , this is usually 100 ft

5. DETERMINE CURRENT SEEDING RATE:

The equation:

$$\text{Seeding rate (lbs/ac)} = \frac{43560\ ft^2/ac}{\text{Drill width (ft)}} \times \frac{\text{lbs seed collected}}{\text{Strip Length (ft)}}$$

Plug the numbers already determined into the equation. If both sides of the equation are equal, the drill is calibrated. If the numbers on either side of the equation are not equal, the drill needs to be adjusted and the process repeated until the drill is calibrated. (From Chapman and Carter, 1976.)

EXAMPLE:

A seed mixture needs to be planted at a rate of 15 lbs PLS per acre. Your current seed lot has a PLS of 82%. A tractor with a 15 ft drill was driven 100 feet while collecting seed; 0.4 lbs of seed was collected.

Step 1 - Determine the desired seeding rate using the current lot of seed:

$$\textit{Bulk seed of current lot needed (lbs/ac)} = \frac{\textit{Desired rate of seed in PLS (lbs/ac)}}{\textit{\% PLS of current seed lot}}$$

$$\textit{Bulk seed of current lot needed (lbs/ac)} = \frac{\textit{15 lbs/ac PLS needed}}{\textit{82\% PLS}}$$

$$\textit{Bulk seed of current lot needed (lbs/ac)} = \textit{18.3 lbs/ac}$$

Steps 2 and 3: Completed

Step 4 - Determine strip length:

Strip length (in field) = The distance driven to collect seed

Strip length = 100 feet

Step 5 – Determine Current Seeding Rate:

$$\text{Seeding rate (lbs/ac)} = \frac{43560\ ft^2/ac \ \mathbf{X}\ \text{lbs seed collected}}{\text{Drill width (ft)} \ \mathbf{X}\ \text{Strip Length (ft)}}$$

$$18.3\ lbs/ac = \frac{43560\ ft^2/ac \ \mathbf{X}\ 0.4\ lbs\ seed\ collected}{(15\ ft \ \mathbf{X}\ 100\ ft)}$$

$$18.3\ lbs/ac = \frac{17424\ lbs/ac}{1500}$$

$$18.3\ lbs/ac = 11.6\ lbs/ac$$

Because the equation was not equal, and the drill was putting out 6.7 lbs/ac less than required, the drill needs to be set at a higher rate and recalibrated until the equation is equal.

REFERENCES

Chapman, Stephen R., and Lark P. Carter. 1996. Crop Production: Principles and Practices. W.H. Freeman and Company. San Francisco, Calif.

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