

Calibrating Fertilizer Spreaders

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Fertilizer spreader types

- Drop spreader
- Broadcast spreader
 - Rotary or centrifugal

Drop spreader calibration

- Calculate the area covered by the drop spreader that travels a specified distance
- Measure width of hopper between wheels
 - Generally 1.5, 2, 2.5, or 3 feet wide
- Measure and mark a distance to travel
 - 66 ft-8 in distance X 1.5 ft width = 100 ft²
 - 50 ft X 2 ft = 100 ft²
 - 40 ft X 2.5 ft = 100 ft²
 - 33 ft-4 in X 3 ft = 100 ft²

Drop spreader calibration

- 2 methods to measure the amount of product being applied
 - “catch pan” method
 - attach a plastic or cardboard “pan” under the hopper to catch the product being applied
 - “sweep” method
 - “apply” the product on a paved surface then sweep and collect the product into a dustpan

Drop spreader calibration

- Set the hopper opening to a low to medium range setting
- Fill the hopper half full with a product
- Push the spreader at a comfortable walking speed that will be the same pace used to actually apply product;
open the hopper;
travel the marked off distance;
close the hopper

Drop spreader calibration

- Remove the “catch pan” with the product or
- “Sweep” and collect the product on the pavement
- Weigh the product
- Record the weight of the product that was collected
- Repeat the procedure 2 or 3 more times or until consistent results are obtained (10%)

Calculate the spreader output

- Output rate = amount collected / area covered
 - amount collected in pounds (16 oz = 1.0 lb)
 - area covered 100 ft² or other calculated from hopper width X distance travelled
 - Output rate = x pounds / 100 ft²

Example calibration

- Target is to apply 0.5 lb / 1000 ft² nitrogen using ammonium sulfate (21-0-0)
 - ammonium sulfate has 21% N
 - $0.5 \text{ lb N} / 21\% = 2.38 \text{ lb ammonium sulfate}$
- Spreader must be calibrated to drop 2.38 lb ammonium sulfate / 1000 ft²
- Target output rate of spreader should be 0.238 lb ammonium sulfate / 100 ft² or 3.8 oz / 100 ft²

Example calibration

- Target is to apply 0.5 lb / 1000 ft² nitrogen using ammonium sulfate (21-0-0)
- Target output rate of spreader should be 0.238 lb ammonium sulfate / 100 ft² or
3.8 oz / 100 ft²
- 10% error rate range 3.4 to 4.2 oz / 100 ft²

Drop spreader calibration

- Repeat the procedure for each setting on the spreader
- Repeat the procedure for each different product that is applied using the spreader
- Record the weights of the products collected
- Record the settings on the spreader associated with each procedure

Broadcast spreader calibration

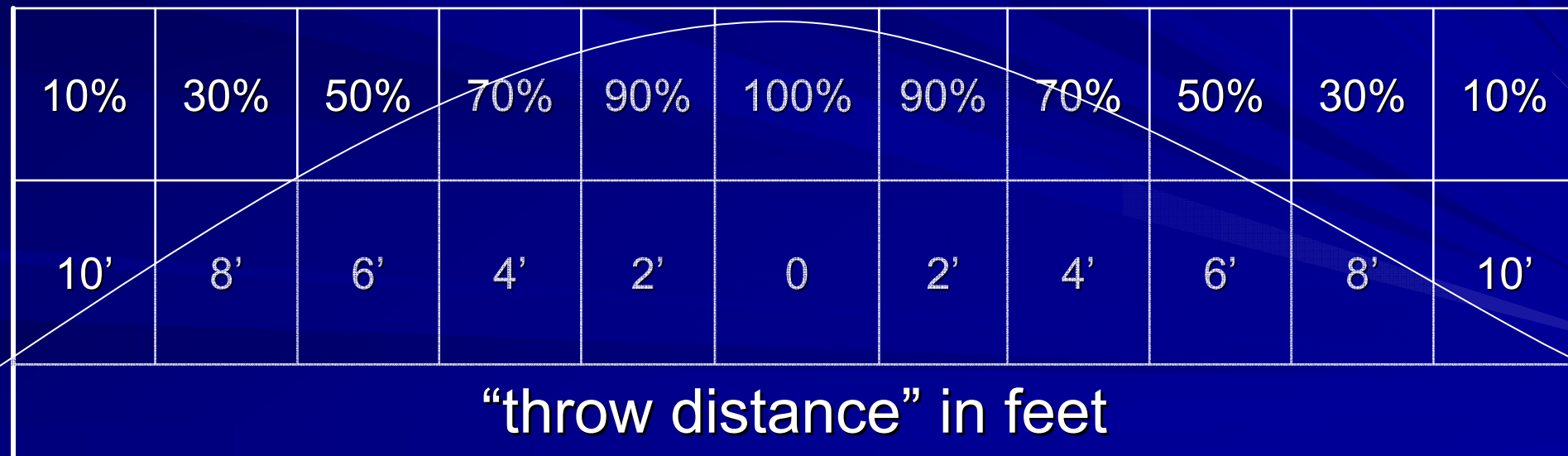
2 steps required for calibration

1. Determine effective swath width of spreader
 - Granular product throw distance to either side of spreader with “collection trays”
 - Distribution is not uniform
 - Even distribution achieved by overlapping
2. Measure amount of product being applied
 - “collection trays”
 - “catch pan” method
 - “sweep method”

Broadcast spreader calibration

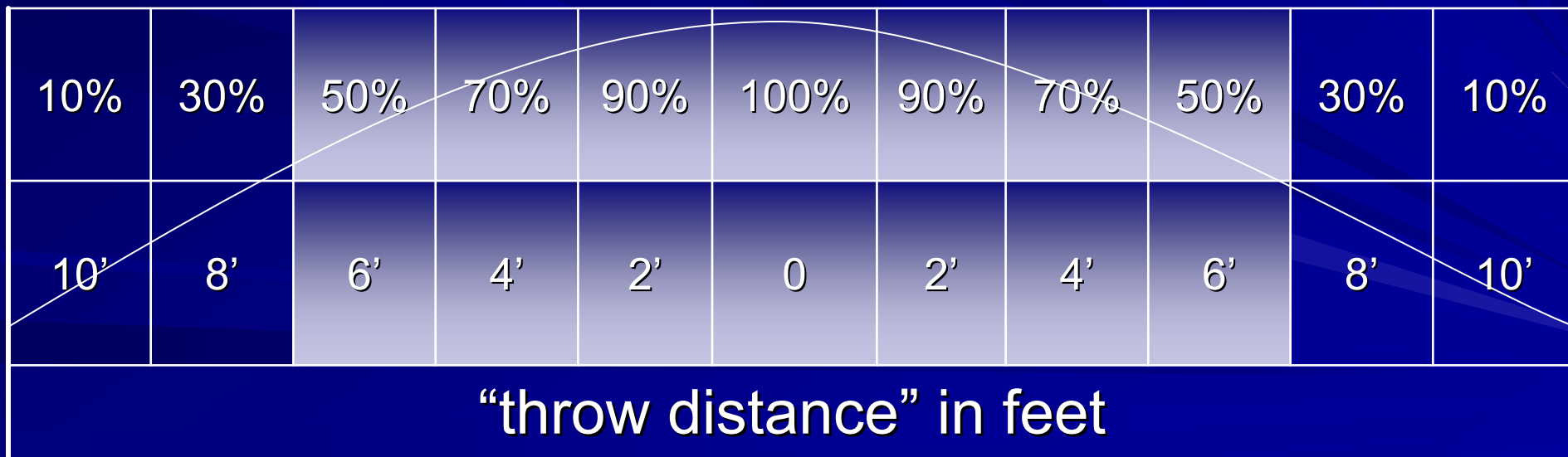
Determine effective swath width of spreader

- Granular product throw distance to either side of spreader with “collection trays”
- Distribution is not uniform



Broadcast spreader calibration

- Effective swath width is where the rate is about 50% of the amount at the center.
- Example is 6 ft left and 6 ft right of center.
- Effective swath width is 12 ft.



Broadcast spreader calibration

- Calculate the area covered by the broadcast spreader that travels a specified distance
- Determine the “effective swath width”
 - Example “effective swath width” = 12 ft
- Measure and mark a distance to travel
 - 83 ft-4 in X 12 ft = 1,000 ft²

Broadcast spreader calibration

Measure amount of product being applied

- “collection tray”
 - Use the center collection tray from the previous effective swath width determination
- “catch pan” method
 - Attach a collection bag or container around the impeller to catch the product being applied
- “sweep method”
 - “apply” the product on a paved surface then sweep and collect the product into a dustpan

Broadcast spreader calibration

- Set the hopper opening to a low to medium range setting
- Fill the hopper half full with a product
- Push the spreader at a comfortable walking speed that will be the same pace used to actually apply product;
open the hopper;
travel the marked off distance;
close the hopper

Broadcast spreader calibration

- Remove the “catch pan” with the product or
- “Sweep” and collect the product on the pavement
- Weigh the product
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- Repeat the procedure 2 or 3 more times or until consistent results are obtained (10%)

Example calibration

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Example calibration

- Target is to apply 0.5 lb / 1000 ft² nitrogen using ammonium sulfate (21-0-0)
 - ammonium sulfate has 21% N
 - 0.5 lb N / 21% = 2.38 lb ammonium sulfate
- Spreader must be calibrated to throw 2.38 lb ammonium sulfate / 1000 ft²
- 0.00238 lb / 1 ft² = 1.08 gm / 1 ft²
 - 1 ft² = 12 in X 12 in center “collection tray”

Calibration worksheet

Spreader setting	Amount of product / covered area*	Calculated amount of product / 1000 ft ²

*covered area = width of hopper X distance travelled

References

- Cooperative Extension “TURF TIPS”
 - a collection of turf maintenance publications designed to provide solutions for turf maintenance
- Cooperative Extension turf maintenance tips written for “Cactus Clippings”
 - a monthly publication of the Cactus & Pine Golf Course Superintendents Association of Arizona
- <http://cals.arizona.edu/turf>