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Drop Spreader Calibration using the 10/160th Method

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Calibrating equipment for a specific amount of granular fertilizer, soil amendment, or cover crop seeds to be spread over a field is important to ensure application accuracy of a recommended product. Proper calibration of a cover crop seed spreader can be time consuming. Over-application of the above mentioned products could lead to wasted materials or environmental pollution. There are many different tools to spread granular products or seed over a field. This article demonstrates a fast and easy way to calibrate the spreading rate (lb/acre) of a product using a drop spreader. We named this method the 10/160th Method based on the conversion used. For more information on spray calibration for liquids please refer to the 1/128 method (Uyeda *et al.*, 2013).

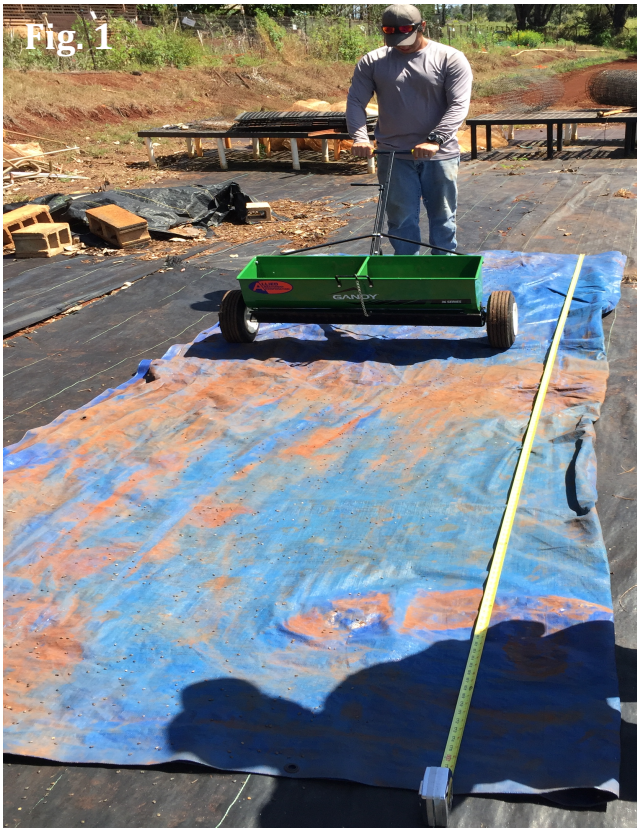
10/160th Calibration Conversions

1 lb (pound) = 16 oz (ounce)
10 lb = 160 oz
1 acre = 43560 ft²
272 ft2 = 1/160th of an acre

Based on the 10/160th calibration method, each ounce of solid material (e.g. fertilizer or seeds) discharged to the 272-sq ft area would correspond to 10 lb of solid material per acre. i.e.

1 oz applied on 272 ft² ⟹ 10 lb/acre

This 10/160th calibration method requires almost no calculations. The accuracy of the delivery is pending on the consistency of application in the test area. It is recommended to repeat the calibration procedure at least 3 times to increase accuracy. Here are step-by-step procedures to carry out the 10/160th method for calibration.



Step 1: Measure the test area equal to 1/160th of an acre (272 sq ft) on a weed mat or tarp larger than the width of the spreader (Fig. 1). For example, the dimension of the calibration area can be 91 ft by 3 ft or 136 ft by 2 ft.

If the width of the spreader is 3 ft and space is limited, walk in the measured area of 30 ft and extrapolate seed weight to achieve an area of 272 sq ft. So 30 ft × 3 ft = 90 sq ft and 272 sq ft/ 90 sq ft = 3.02. Multiply the weight

from the 90 sq ft area by 3.02 to get to ounces per 272 sq ft.

Step 2: Fill the hopper with X amount of seeds or granular fertilizer (Fig. 2a). Adjust the setting of the drop spreader appropriately for product size (Fig. 2b). Spread over the measured area.


Fig. 2a


Fig. 2b

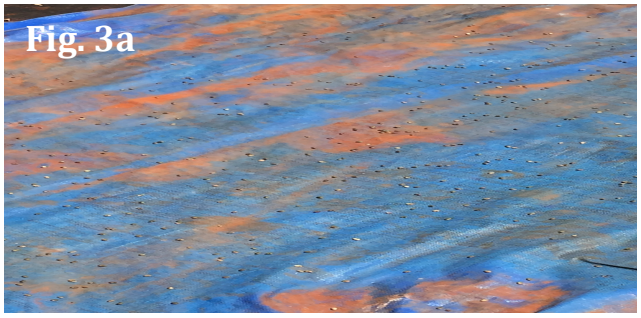


Fig. 3a

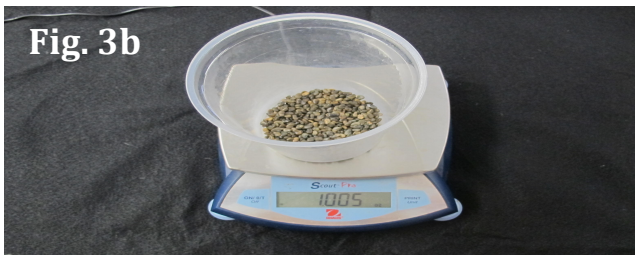


Fig. 3b

Step 3: Collect and weigh total amount of seeds or granular fertilizer dropped over the measured area (Fig. 3a, b).

Step 4: Repeat steps 2 and 3 till the desired rate is achieved. Changing the settings on the drop spreader narrows or widens the triangular openings (Fig. 4).


Fig. 4

Step 5: The amount of seed or granular fertilizer collected in ounces times 10 will correspond to the pounds per acre applied.

For example, a drop spreader with a setting of #30 had spread 3 ounces of seed over the measured area of 272 sq ft. The spread coverage according to the 10/160th Method in this example is 30 lbs per acre.

Variables to consider for calibration

- Seed/ granule size
- Seed mixes
- Functionality of the drop spreader
- Walking speed
- Atmospheric conditions alter granular texture
- Calibration terrain should be similar to the field

Fig. 5

Summary
Application of solid materials (seeds or fertilizers) is dependent on the application tools. Recalibrate at the start of application to know how much product is applied. The 10/160th method provides a simplified approach to calibrate spreader coverage. A similar concept can be applied to other equipment like broadcast spreaders, compost spreaders, handheld spreaders, etc.

Disclaimer
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References
Uyeda, J., Sugano, J., Fukuda, S., Kawate, M., Shimabuku, R., and Wang, K.-H. 2013. Sprayer Calibration Using the 1/128th Method for Boom Spray Systems. University of Hawaii College of Tropical Agriculture and Human Resources. PRRE-8. https://www.ctahr.hawaii.edu/oc/freepubs/pdf/PRRE-8.pdf

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