

Spinner-Disc Spreader Calibration Procedure

Spread Pattern Test Kit

The spread pattern test kit contains:

Collection Pans	21
Plastic Dividers	21
Test Tubes	21
Test Tube Rack	1
Funnel	1
Density Scale	1
Handheld Tachometer	1
Flags	25
Tape Measure (200 ft.)	1
Data Sheets	30



Test Preparation

Product Density: Use the density scale included in the spread pattern kit to measure the product density. Fill the scale with material up to its brim and balance the scale using a pocket knife (or a similar object) to determine the fertilizer density in pounds per cubic foot. Note down the average of three readings.

Gate Height: Use the rate chart provided by the spreader manufacturer to determine the gate height based on measured product density. Set the gate height for desired application rate. Make sure that the gate is level and the indicator reads the actual height of the gate in inches.

Flow Divider Position: The position of flow divider relative to the spinner discs determines the product drop location on the spinner-discs. Follow instructions in spreader operator's manual on setting flow divider's initial position. The general recommendation for starting position of flow divider is 1-1/2" for lime and 2-1/2" for fertilizer products for most spinner-disc spreaders.

Spinner-Disc Speed: Check spreader operator's manual for the recommended spinner speed for the product being spread. Fertilizer properties (particle size and weight) play an important role in adjusting the spinner speed for obtaining best spread pattern and width. The optimal spinner speed generally varies between 650 – 750 rpm for most fertilizers. Use the handheld tachometer for checking that spinner discs are operating at the correct speed.

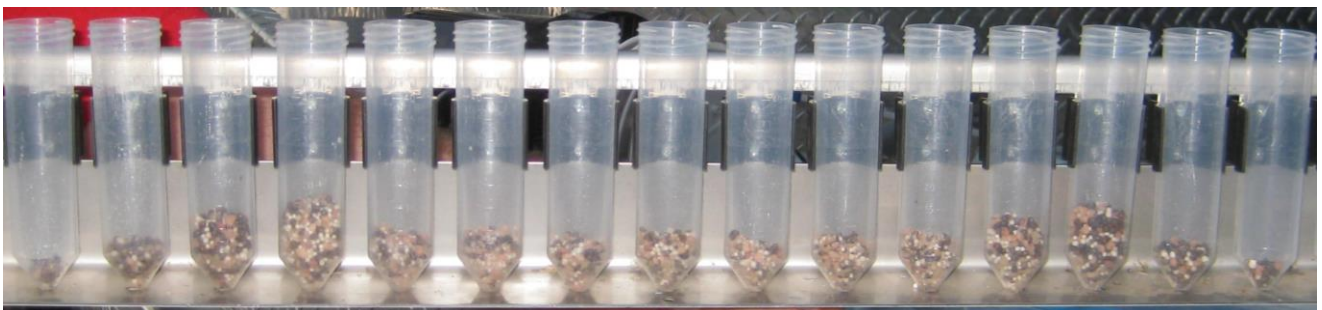
Data Sheet: Prior to each test, record information on product density, gate height, divider position, spinner-disc speed and other spreader settings on the data sheet.

Calibration Procedure

1. Select a test area approximately 120 feet by 400 feet with a slope of less than two degrees.
2. Place a plastic divider (gridded) inside each collection pan. Using a tape measure, place the collection pans on 5 ft. spacing intervals with the long side parallel to the direction of the travel. A pan spacing of 2.5 ft. can also be utilized for more accurate representation of the spread pattern.
3. Position the pans in the test area so that the spreader (while in operation) will have at least 100 ft. before it reaches them and can continue spreading 150 ft. beyond the pans.

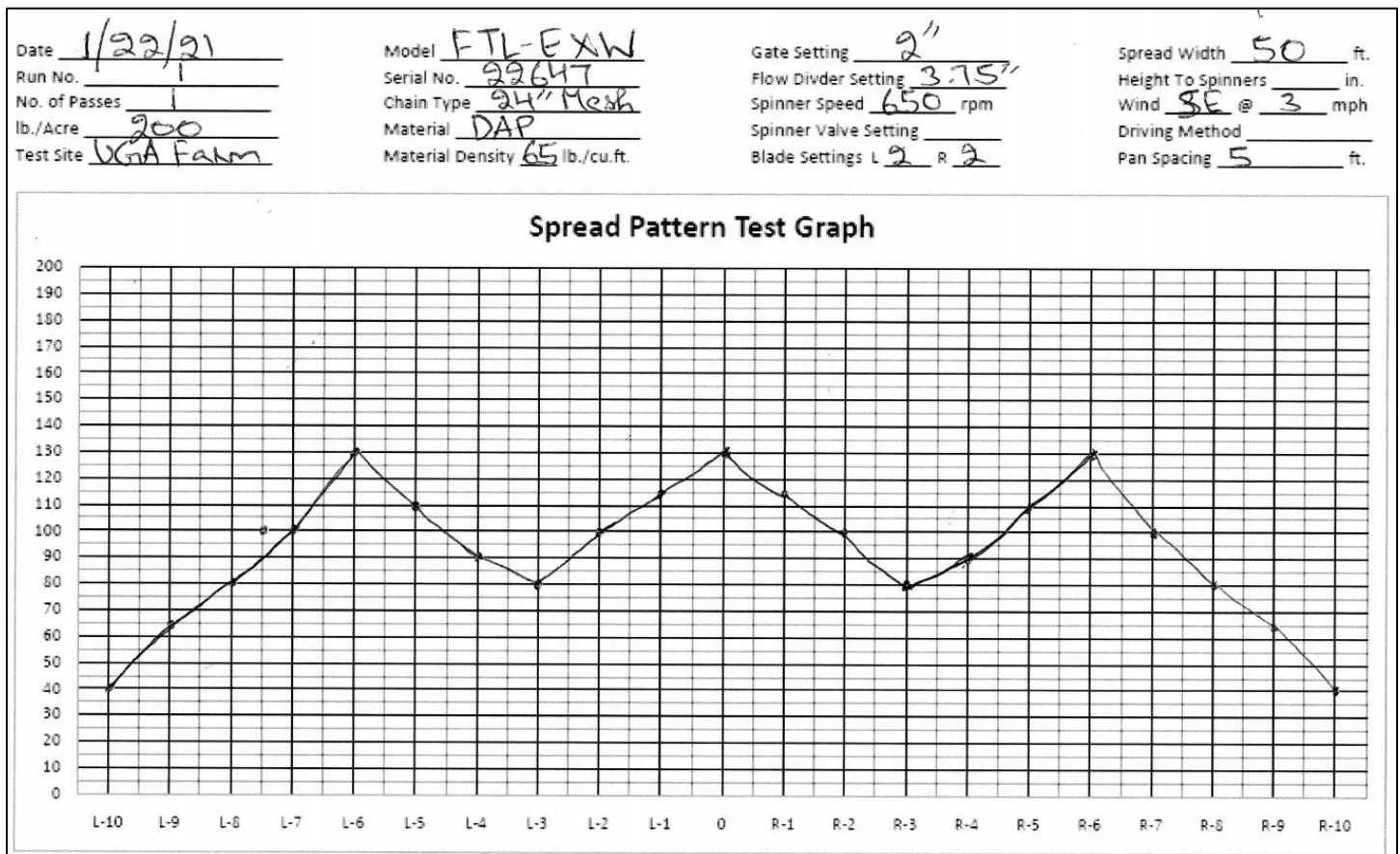


4. Mark location of each pan with a flag so that pans can be placed back at their original position along the swath after each spreader pass. Pans in the test kit are labelled as L1 – L10 for pans on the left-hand side of the swath, C as the center pan, and R1 – R10 for right-hand side pans.
5. If possible perform the spread pattern test when wind speed is less than 5 MPH. If wind speed is greater than 5 MPH, testing must be completed while spreading parallel to the wind direction. Do not perform spread pattern test if wind speed is greater than 10 MPH.
6. Before driving across the pans, operate the spreader long enough for the rate to level out and spinner speed to remain constant.
7. Position spreader at the beginning of the course so that the spreader will straddle the center pan.
8. Keep the direction of travel consistent between all the tests. Do not drive spreader over the pans in both directions.
9. Make sure the correct gate height is set for desired application rate and spinners are turned on. Drive the spreader over the pans at normal operating speeds (between 5 and 10 mph).
10. Carefully transfer the material from each collection pan into the corresponding test tube (marked with same numbers as pans) in the rack using a funnel. As an alternative to using test tubes, material collected in each pan can be weighed using a scale accurate up to 0.1 gram.
11. Place the pans back at their original position across the spread swath (marked with flags) for the next pass.



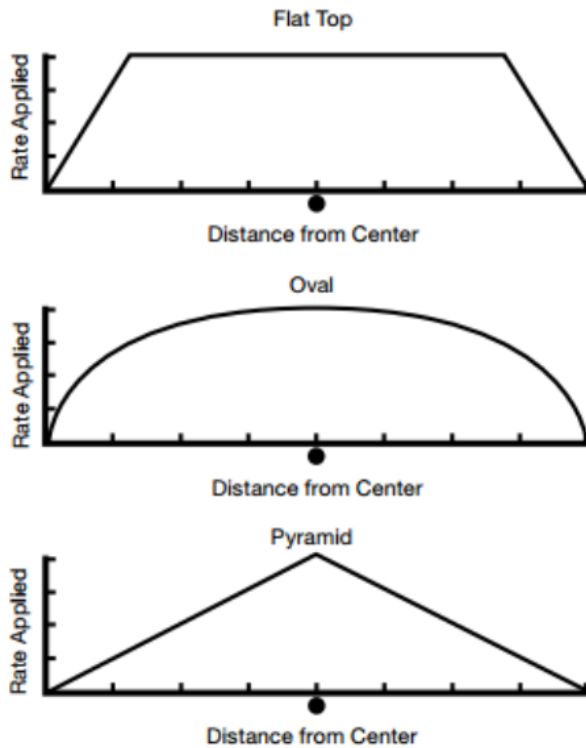
Analyzing Spread Pattern

1. The amount of material collected in the test tubes provides a quick visible evaluation of the spread pattern. *(Important to note that the test tube method only provides a quick assessment of material distribution along the swath whereas weighing the material from each pan will also help determine the applied product rate (lbs/ac) at each pan location across the spread swath)*
2. On the data sheet provided with the test kit, record the amount of material in each test tube corresponding to its position on the graph by marking a point. Each 20-point increment on the Y-axis in the graph corresponds to a 5-ml graduation on the test tube.
3. Join the points on the data sheet with a straight line to complete the single-pass spread pattern attained during the test. An example of a typical W-shaped spread pattern is illustrated below on the data sheet. If material is weighed from each pan, a more accurate representation of the spread pattern can also be shown graphically in MS Excel.
4. Analyze the spread pattern drawn on the data sheet by comparing it to the “Acceptable” and “Undesirable” spread patterns shown on the next page.
5. Follow the troubleshooting guidelines provided here (along with information provided in the spreader operator’s manual) to adjust the spreader settings to correct an undesirable spread pattern. Make sure to change only one setting at a time and perform the spread pattern test after each adjustment.
6. Once an acceptable spread pattern is attained, make two more spreader passes using the exact same spreader settings to verify the spread pattern. Save all the data sheets including ones with the undesirable spread patterns along with detailed notes on spreader adjustments made during testing.

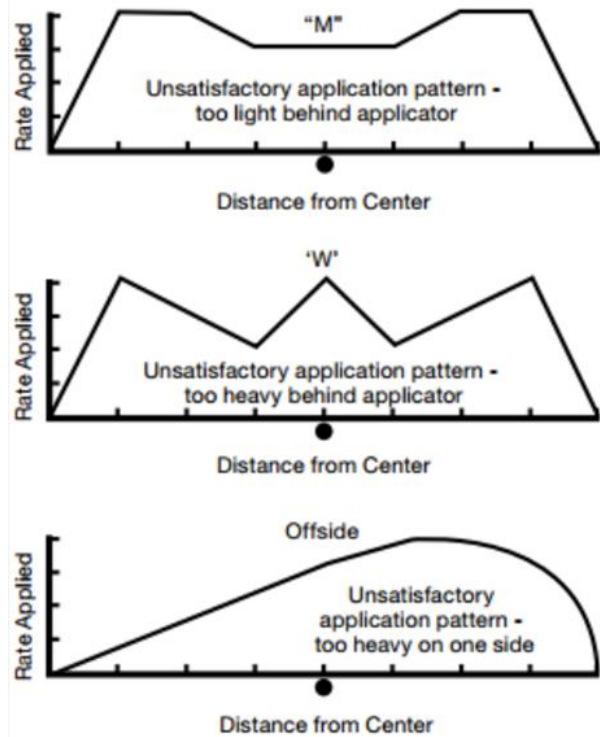


Common Spread Patterns for Spinner-Disc Spreaders

Acceptable



Undesirable and Needs Spreader Adjustment



Troubleshooting Undesirable Spread Patterns

Problem	Recommended Adjustments
Too heavy directly behind the spreader (W-Pattern)	<ol style="list-style-type: none"> 1) Move the material flow divider towards the back of the spreader. 2) Decrease the spinner speed. 3) Check spinner blade condition.
Light directly behind the spreader (M-Pattern)	<ol style="list-style-type: none"> 1) Move the material flow towards the front of the spreader. 2) Increase spinner speed. 3) Check spinner blade condition.
Pattern Off Center (Skewed Pattern)	<ol style="list-style-type: none"> 1) Check feed gate to see if it is level and free of caked material. 2) Check material flow divider is centered and adjusted properly. 3) Ensure that there are no speed differences between the discs.

Questions or Need Assistance: For more information or assistance with the spinner-disc spreader calibration procedure, reach out to your local county extension agent or contact Dr. Simerjeet Virk at svirk@uga.edu or (334) 750-8130.