

NEW LEADER

How to Check Your G4 Spread Pattern



MANUAL NUMBER: 313967-A

EFFECTIVE 06/2017



Highway Equipment Company

Building the best since 1939.

**1330 76TH AVE SW
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**WARNING**

Use great caution while working around the spreader. Contact with spinners and other moving parts is very dangerous. Do not adjust while machinery is moving, wear eye protection and avoid discharge from spinners. Do not ride on moving spreader.

NOTICE!

Spinner assembly and material divider have NOT been adjusted at the factory. Before spreading material, spread pattern tests must be conducted to properly adjust the spread pattern. A spread pattern test kit is available for this purpose.
THE MANUFACTURER OF THIS SPREADER WILL NOT BE HELD LIABLE FOR MISAPPLIED MATERIAL DUE TO AN IMPROPERLY ADJUSTED SPREADER.

It is recommended that spread pattern tests be conducted prior to each spreading season, after any spreader maintenance, before applying a new product, and periodically during the spreading season. Spread pattern tests must be performed for each product, blend and application rate.

Spread pattern is affected by many factors. Among the more significant of these are:

- Spinner speed
- Point of material delivery on spinner discs
- Angle of the distributor fins on the spinner discs
- Condition of spinner fins
- Material granule size
- Height of spinners from ground
- Spacing of swaths (driving centers)
- Wind and humidity
- Rate of material delivery

Since many of these factors will vary for each job, trial and experience must be used to determine the adjustments required to obtain the swath width and spread pattern desired. The following instructions outline the adjustments available and the effect that each will have on the spread pattern.

SPREAD PATTERN TEST KIT

Spread Pattern Test Kit, part no. 313960, includes the following:

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
313712	Box - Plastic Storage	1	58897	Scale – Density	1
313963	Center Collection Tray - Blue	1	313964	Data Sheets	100
70890	Collection Tray - Brown	22	300503	Screw – #6-32 x 3/8	46
87200	Divider	23	300504	Nut – Lock #6-32	46
313962	Rack – Tube	1	70897	Flags	5
300507	Test Tube	23	313965	Rope – 120’ marked	1
300505	Clip – Molded	23	87201	Stake	2
87332	Funnel	1			

SPINNERS**NOTICE!**

Spinner discs and fins must be kept clean and polished. Even a small build-up on a spinner fin can significantly affect the spread pattern. Rusty, rough, bent or worn fins will produce poor spread patterns.

In general, critical spinner speed will fall somewhere between 600 and 900 RPM. Spinner speed is adjusted by changing the settings in the controller. Proper spinner speed adjustment is critical in obtaining optimal spread patterns. The best spinner speed to use will depend entirely on the material being spread, and must be determined by testing.

A major factor of maximum pattern width is particle size. Swath width may vary anywhere from 25 feet (7.6 m) for very finely ground dry lime up to 120 feet (37 m) or more for extremely large fertilizer pellets.

For every material there is a critical spinner speed. In other words, there is a speed which will result in the maximum obtainable spread width. Going beyond this speed will not increase spread width, but will degrade, or crush material.

Too high of a spinner speed could result in a heavy deposit behind the truck due to break-down of material. This upper speed limit will be quite low for finely powdered material, and can be quite high for extremely coarse materials.

SPREADER PREPARATION

The spreader to be tested must be in good mechanical condition and properly adjusted. Refer to operator's manual for details.

All damaged and worn parts must be replaced. Spinner discs and fins must be free of any material build-up, rust or paint.

Fill the hopper with the material to be spread. Run the material out to the end of the conveyor.

Set the feedgate and the in-cab controller to deliver the required rate per acre. Make sure the feedgate is level and the indicator reflects the actual gate opening measured by standing a tape measure vertically in the material.

NOTE: Do not match slope of endgate when making this measurement. Measurement must be perpendicular to conveyor.

Adjust the spinner assembly by turning the crank or, if an actuator is installed, change the setting in the controller. To begin testing, position the spinner according to the chart below.

NOTE: This chart is to be used as a reference only to begin testing.

MATERIAL	SPINNER FRAME SETTING in (cm)	SPINNER RPM
Lime	1 (2.5)	625
Straight Urea	3.5 (9.5)	700
All other Fertilizer types and blends, including Urea blends	3.5 (9.5)	750

TEST PROCEDURE

Using the data sheets supplied with the kit, document all spreader information and adjustments as necessary. See Figure 1.

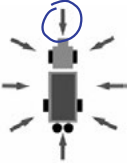
NEW LEADER		G4 SPREAD PATTERN DATA SHEET		1330 76th Ave SW Cedar Rapids, IA 52404-7052 (319) 363-8281		
		Highway Equipment Company				
Pattern Test No. <i>1</i>	Rev.	Spreader Model: <i>L4000G4</i>	 <p>(Circle Direction of Wind Relative to Spreader)</p>			
Site: <i>HECO</i>		Serial No. <i>432165</i>				
Date: <i>10/07/2016</i>	Time: <i>10am</i>	Conveyor Type: <i>#4 BOC</i>				
Material Name: <i>MAP</i>		Fan Frame Setting: <i>3.25</i> in.				
Density: <i>65</i> lb/ft ³		Feedgate Height: <i>3"</i> in.				
Crush Strength: <i>6</i>		Fin Position: <i>1-2-1-2</i>				
SGN: <i>324</i>						
Application Rate: <i>320</i> lbs/acre		CFR/Constant: <i>.232</i>				Wind: From <i>Straight</i> at <i>5</i> MPH
						Relative Humidity: <i>41%</i> %
						Temperature: <i>67</i> °F
Spinner Speed: <i>780</i> RPM		Controller Vehicle Speed: <i>12</i> MPH	Controller Swath Width: <i>90</i> ft.			

Figure 1

Select an area for testing measuring at least 120 feet x 200 feet (37 m x 61 m), and with a slope of less than two degrees.

All testing should be done when the wind velocity is less than 5 MPH (8.05 km). If wind is present, testing must be done with spreader traveling parallel (within ± 15 degrees) to the wind direction.

Do not allow loaded spreader to sit for more than one hour prior to testing.

At this stage of testing, drive the spreader over the collection trays in ONLY ONE DIRECTION.

Insert a plastic grid into each of the 23 collection trays. Position the blue collection tray in the center of the spreader’s path with the longest dimension of the tray parallel to the direction of travel. Position the first left-hand and right-hand trays 10’ (3m) from center, and all subsequent trays on 5’ (1.5m) centers.

Four-Wheeled Vehicles

For four-wheeled application vehicles, position the spreader at the beginning of the course so that the vehicle will straddle the center collection tray. See Figure 2.

Engage spinners before navigating the course. As the vehicle approaches the flag positioned 75' before the row of collection trays, engage the conveyor(s). Do not shut the conveyor(s) off until the vehicle approaches the second flag.

Drive spreader completely through course at normal operating speeds.

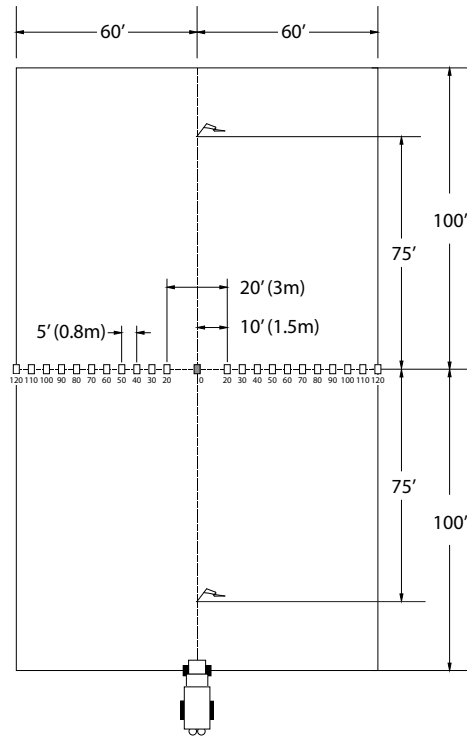


Figure 2 – Four-Wheeled Vehicles

Three-Wheeled Vehicles

For three-wheeled application vehicles, straddling the center tray is not possible. Place the center collection tray beneath the vehicle just behind the front tire when the spreader is in position at the beginning of the course. See Figure 3.

Engage both the spinners and conveyor(s) before navigating the course. Do not shut the conveyor(s) off until the vehicle approaches the second flag.

Drive spreader completely through course at normal operating speeds.

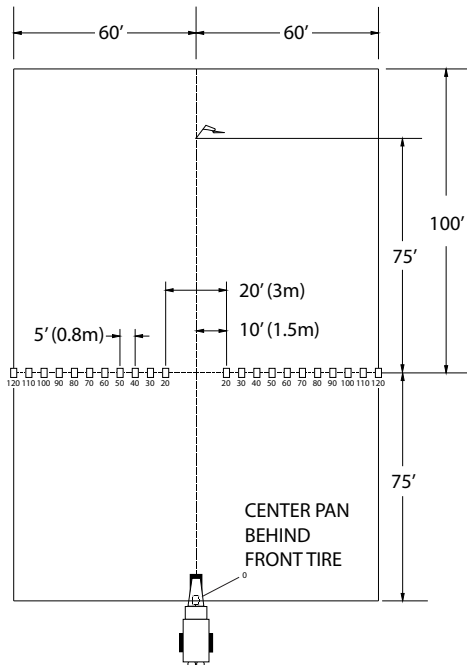


Figure 3 – Three-Wheeled Vehicles

TEST RESULTS

After navigating the course, shut the spreader down and park in a secure location.

Using the funnel, transfer the contents of each collection tray into its corresponding test tube beginning at one end of the trays and working towards the opposite end.

If spreading a blend of materials, inspect all tubes to determine if the blend is consistent across the entire swath width. If the blend is not consistent, use a narrower swath width. The swath width should be based on the material thrown the shortest distance.

NOTE: If spreading a slow release nitrogen product, inspect the three center tubes for crushed material. If crushed material is excessive, reduce spinner speed by 25 RPM and repeat test. If little to no crushed material is present, spinner speed may be increased by 50 RPM to increase overall swath width if desired. As long as there is little to no crushed material, this process can be repeated until maximum swath width is achieved.

Record each test tube's volume in the box on the data sheet under the corresponding tray position and graph the spread pattern profile. See Figure 4.

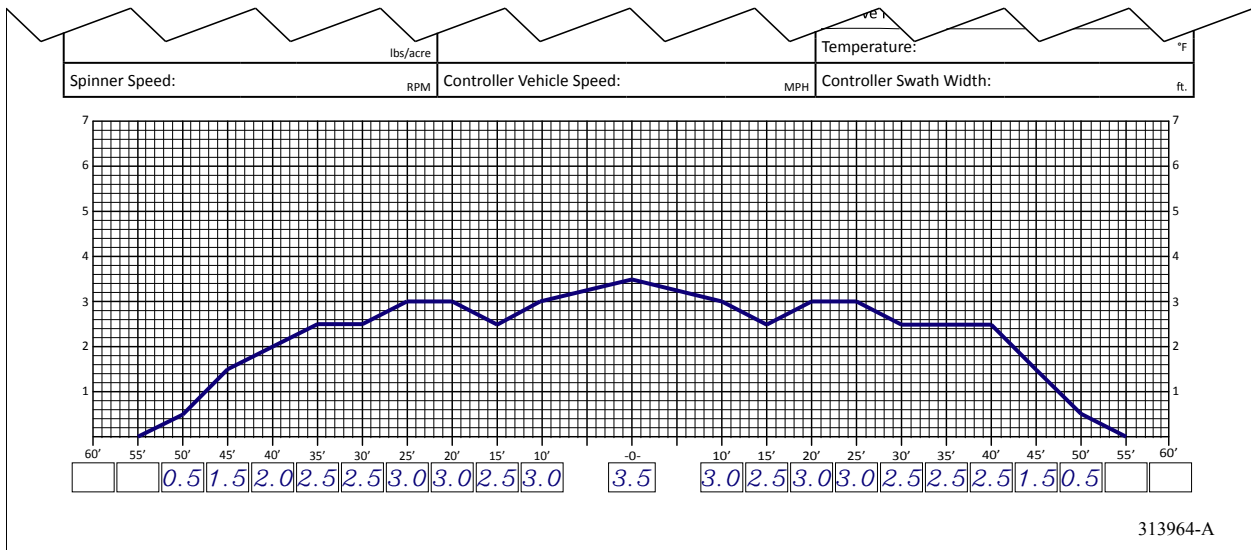


Figure 4

Looking at the material in the test tubes and the graphed profile on the data sheet, compare the overall shape of the spread pattern to the three acceptable patterns, shown in Figure 5. If an acceptable pattern has not been achieved, proceed to "Troubleshooting" on page <?>. Once an acceptable pattern has been achieved, proceed to "Determining Driving Centers" on page <?>.

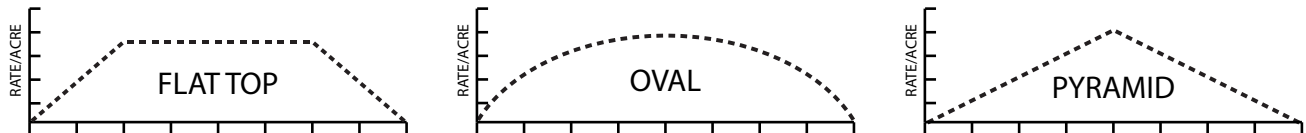


Figure 5 – Acceptable Patterns

TROUBLESHOOTING

NOTE: It is highly recommended that **ONLY ONE ADJUSTMENT** be made between test samples taken. If more than one adjustment is made, it will be difficult to determine which adjustment was responsible for the change in pattern shape.

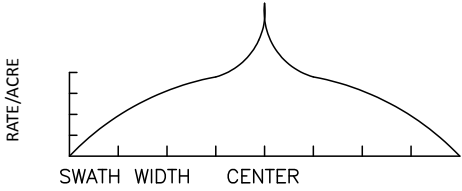
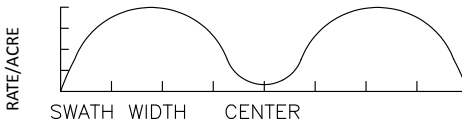
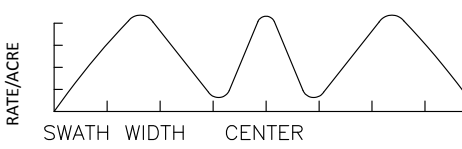
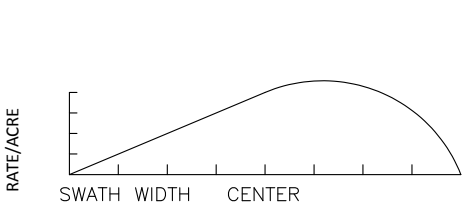
Problem	Pattern	Recommended Adjustments
Heavy Directly Behind the Vehicle		1. Move the spinner forward (toward the conveyor).
Light Directly Behind the Vehicle		1. Move the spinner rearward (away from conveyor).
Light Outside Vehicle's Tire Tracks		1. Check spinner fins for material buildup. 2. Increase spinner RPM. 3. Move spinner fins to 2 - 3 - 2 - 3 positions. See Figure below.
Pattern Off Center		1. Check to see feedgate is level and free of caked material. 2. Make sure hillside divider is mounted squarely and centered. 3. Check to be sure spinner assembly is mounted squarely and centered. 4. Make sure material divider is mounted squarely and centered. 5. Testing should be done parallel to wind.

Figure 6

Spinner fins are adjustable to radial angle as shown in Figure 7. Refer back to Figure 6 for fin adjustment recommendations.

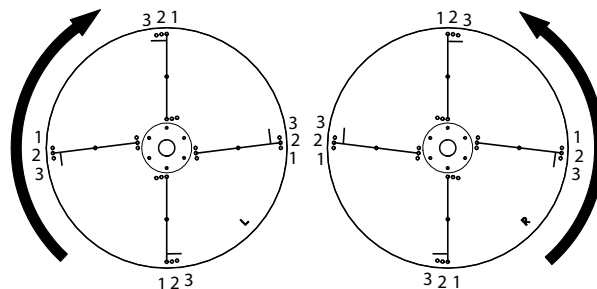


Figure 7 - Spinner Fin Adjustment

DETERMINING DRIVING CENTERS

Once an acceptable pattern is obtained, as shown in Figure 5, driving centers can be determined. To determine optimum driving centers (effective swath width), determine the average amount of material in the center of the pattern. Figure 8A shows an example data sheet recorded from the profile shown in Figure 8B. Based on the example, the average amount of material in the center of the pattern is 3.0, as indicated with the red dotted line.

Next, locate the points on both the left and right side of the pattern where the amount of material is half the average amount at the center of the pattern. In the example shown in Figure 8, these points are located 45' to the left of center, and 45' to the right of center. The distance between these two points (90') represents the driving centers to use.

NOTE: Once the effective swath width has been established, a change in the controller may be required.

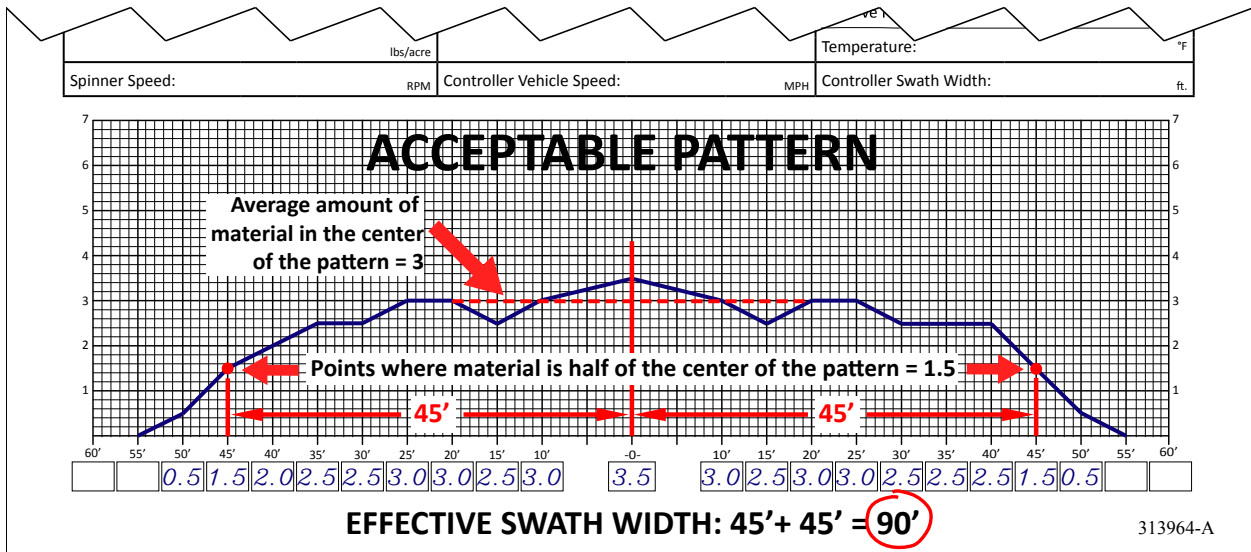


Figure 8A - Effective Swath Width

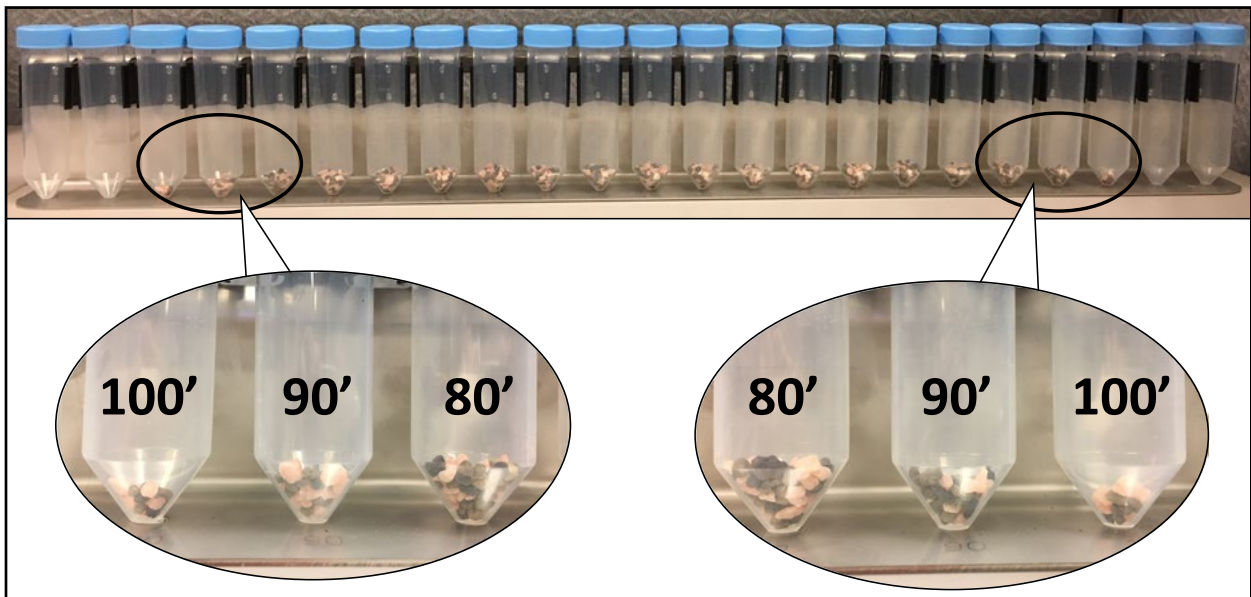


Figure 8B

VERIFYING DRIVING CENTERS

Once optimum driving centers (effective swath width) have been established, conduct a final “S” pass over the trays to verify. Refer to Figure 9.

1. With both the spinners and conveyor turned off, drive the spreader through the center of the course, establishing an “AB” line. If the spreader vehicle is a three-wheel type, remove the center pan.
2. Line the vehicle up with either end of the row of collection trays, at a distance from the “AB” line equal to the effective swath width.
3. With both the spinner and conveyor engaged, drive past the trays.
4. Switch back and drive over the center of the trays, down the “AB” line.
5. Drive through the row of trays and switch back once again, driving past the trays on the opposite side, at an equal distance from the “AB” line as the first pass.

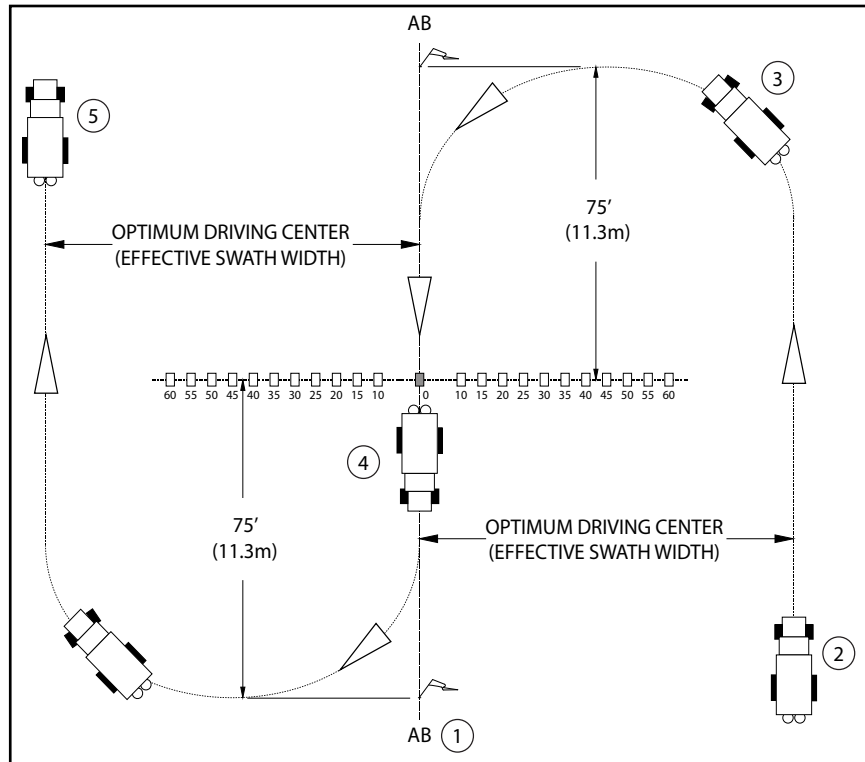


Figure 9

If the driving centers were determined correctly, all trays should have a similar amount of material, showing a near flat profile in the test tubes. If the trays near the center of the row contain more material than the others, increase driving centers. If the trays near the center of the row contain less material, decrease driving centers.

NOTE: If spreading a blend of materials, verify blend of all products is consistent across all tubes.