

# **NEW LEADER**<sup>®</sup>

## **HOW TO CHECK YOUR G4 SPREAD PATTERN**



**EFFECTIVE 07/2010**

**Revision E**



**Highway Equipment Company**

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Refer to [www.highwayequipment.com](http://www.highwayequipment.com) for installation instructions. Once on the website, click New Leader, then Support, then Operator’s Manuals, then Fertilizer Spreader Manuals, then G4 Spread Pattern Installation Instructions.

**NOTICE!** Spinner assembly has 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, part number 300508, is available for this purpose. THE MANUFACTURER OF THIS SPREADER WILL NOT BE LIABLE FOR MISAPPLIED MATERIAL DUE TO AN IMPROPERLY ADJUSTED SPREADER!

 **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.

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

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

- |                                                      |                                                        |
|------------------------------------------------------|--------------------------------------------------------|
| 1. Spinner speed.                                    | 8. Angle of the distributor fins on the spinner discs. |
| 2. Material weight per cubic foot.                   | 9. Cleanliness of the spinner fins and discs.          |
| 3. Material granule size.                            | 10. Level of spreader.                                 |
| 4. Material flow characteristics.                    | 11. Wind and humidity.                                 |
| 5. Rate of delivery of material.                     | 12. Spacing of swaths.                                 |
| 6. Point of delivery of material on spinner discs.   | 13. Wear on spinner fins.                              |
| 7. Balance between deliveries to both spinner discs. |                                                        |

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

**SPREAD PATTERN TEST KIT**

300508 Spread Pattern Test Kit, includes the following:

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
70890	Collection Tray	21	99418	Data Sheets	100
87200	Divider	21	300503	Screw – #6-32 x 3/8	42
300506	Rack – Tube	1	300504	Nut – Lock #6-32	42
300507	Test Tubes	21	70897	Flags	5
300505	Clip – Molded	21	87199	Rope – 120’ marked	1
87332	Funnel	1	87201	Stakes	2
58897	Scale – Density	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.

Fan speed is adjustable from approximately 400 to 900 RPM. This is accomplished by changing the settings in the controller. Proper fan speed adjustment is very important in obtaining good spread patterns. The best fan 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. This 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 fan speed. In other words, there is a speed which will result in the maximum width obtainable. Going beyond this speed will not increase spread width, but will result in poor patterns.

Too high a fan 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. In general, this critical speed will fall somewhere between 600 and 800 RPM for ordinary materials.

One way to adjust fan speed is to watch the material leaving the fans. At slow speed the material leaves the blades in narrow bands. At medium speed it forms wide bands in the air. At somewhat higher speed, the bands close into a uniform blur. Normally, the proper fan speed is slightly higher than that when the bands close to a blur.

It is recommended that a spread pattern test be performed for each product and application rate you handle. Once initial testing is completed, testing should be repeated at the beginning of every season, or any time maintenance is performed on any component affecting spread patterns.

**SPREADER PREPARATION**

The spreader to be tested shall be in good mechanical condition and properly adjusted according to the Operation and Maintenance Manual.

All damaged and worn parts must be replaced. Spinner discs and blades 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 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 fertilizer.

NOTE: Do not match slope of endgate when making this measurement.

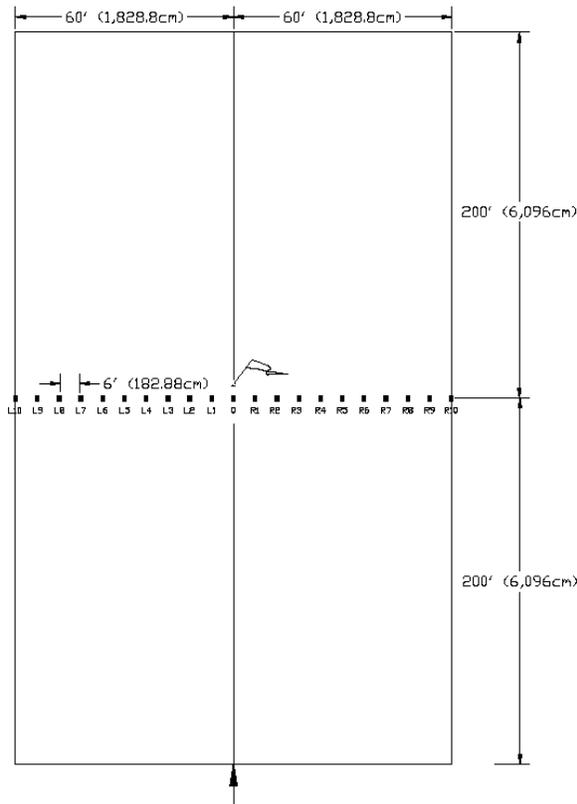
Adjust the spinner assembly by turning the crank or, if an actuator is installed, change the setting in the controller. To begin testing, position the spinner according to the chart below. NOTE: This chart is to be used as a reference only to begin testing.

<b>MATERIAL</b> lbs/cu ft (kg/cu m)	<b>SPINNER POSITION</b> (SEE DECAL)
LIME – LIGHT 80 (1281) Note: Remove divider back plate.	1
LIME – HEAVY 100 (1601) Note: Remove divider back plate.	0
FERTILIZER 65 (1040)	3.5 – 3.75
UREA 48 (768)	3.75 – 4
MIXED PRODUCT, MULTAPPLIER 65 (1040)	3.75

**TEST PROCEDURE**

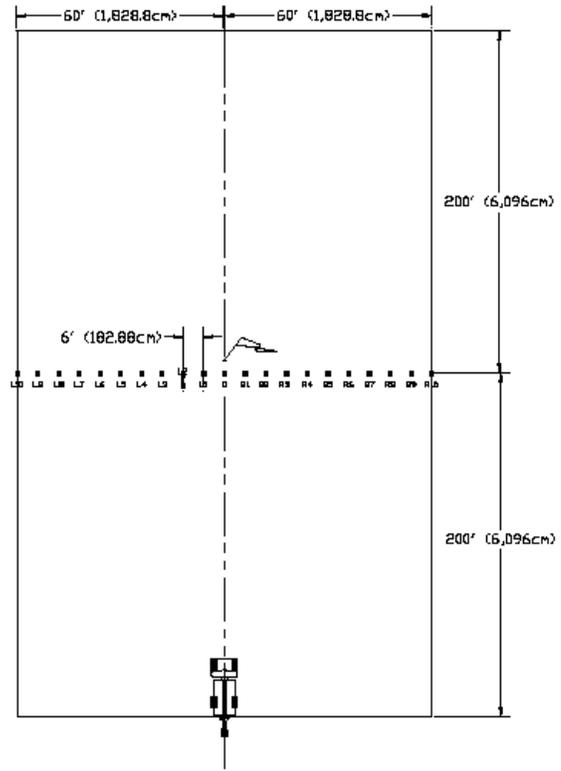
The area selected for testing, measuring 120 feet x 400 feet (37 m x 122 m), should have a slope of less than two degrees.

Insert a plastic grid into each of the 21 collection trays. Position the 21 collection trays on six-foot (6') (182.88cm) centers with the longest dimension of the tray parallel to the direction of travel. (Figure 1)



DIRECTION OF TRAVEL  
COURSE SET UP FOR PATTERN TEST

**Figure 1 – Tray Positions**



DIRECTION OF TRAVEL  
COURSE SET UP FOR PATTERN TEST

**Figure 2 – Spreader Position**

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  $\pm 15$  degrees) to the wind direction.

Do not allow loaded spreader to sit for more than four hours prior to testing.

Prior to driving the spreader through the test course, it should be driven at least 450 feet (137 m) at spreader test speeds.

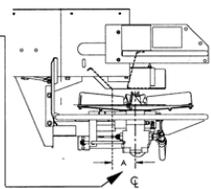
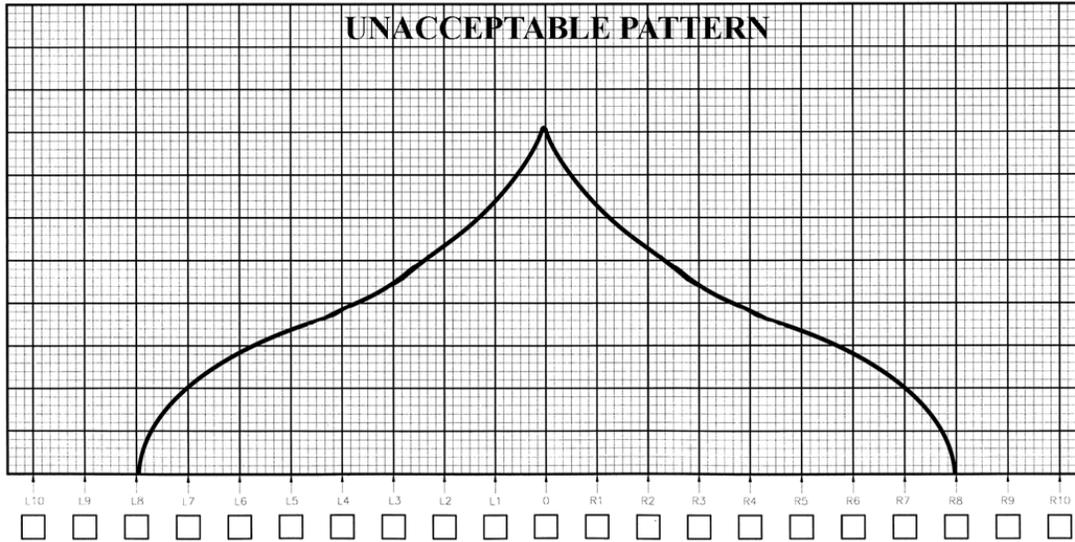
Spreader must be driven over the collection trays in **ONLY ONE DIRECTION**.

Position spreader at the beginning of the course so that vehicle will straddle center collection tray. (Figure 2) Set gate opening based on desired rate/acre according to theoretical application charts supplied with each unit.

Drive spreader completely through course at normal operating speeds.

DATA RECORDING

Pattern Test No. <u>2</u>	Material Used <u>FERTILIZER</u>	Spinner Indicator Setting <u>3 1/2" (8.89cm)</u>
Site <u>HECO</u>	Weight/Cu.Ft. <u>60#</u>	Drop-off Point to CL Distance <u>2" (5.08cm)</u>
Date <u>12.06.07</u>	Rate/Acre <u>200</u>	Blade Settings <u>2 1 2 1</u>
Spreader Model <u>L3020G4</u>	Gate Opening <u>2 1/2</u>	Spinner Valve Setting <u>7</u>
Conveyor Type <u>#4</u>	Wind: From <u>at</u> MPH	Spinner RPM <u>700</u>

Pattern Test No. <u>2</u>	Material Used <u>FERTILIZER</u>	Spinner Indicator Setting <u>3 3/4" (9.53cm)</u>
Site <u>HECO</u>	Weight/Cu.Ft. <u>60#</u>	Drop-off Point to CL Distance <u>2" (5.08cm)</u>
Date <u>12.06.07</u>	Rate/Acre <u>200</u>	Blade Settings <u>2 1 2 1</u>
Spreader Model <u>L3020G4</u>	Gate Opening <u>2 1/2</u>	Spinner Valve Setting <u>7</u>
Conveyor Type <u>#4</u>	Wind: From <u>at</u> MPH	Spinner RPM <u>700</u>

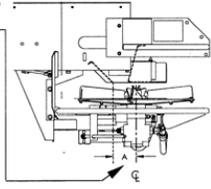
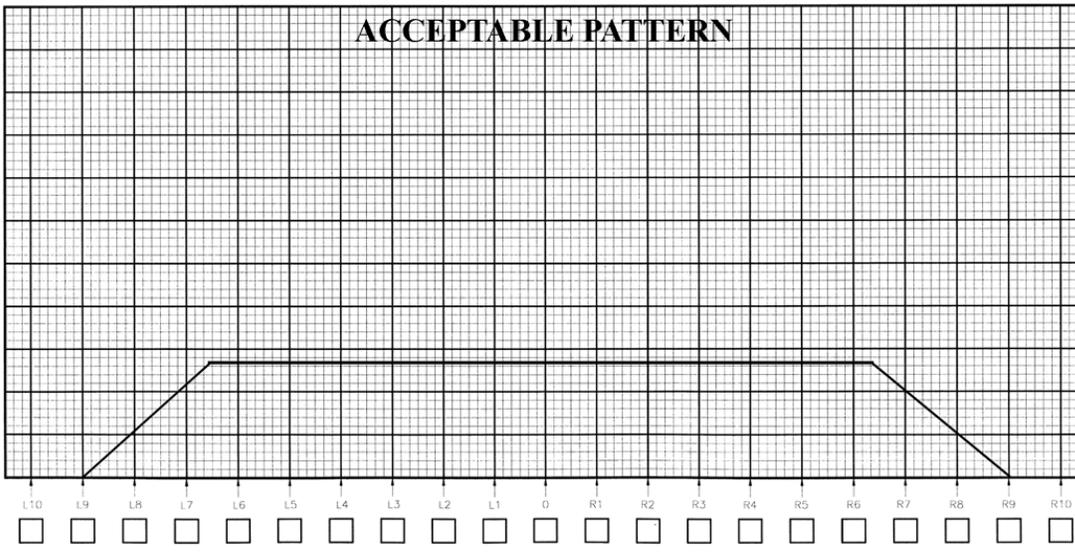



Figure 3 – Spread Chart Example

TEST EQUIPMENT & PROCEDURES

Using the data sheets supplied with the kit, document all spreader adjustments required.

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.

Record the volume in each test tube in the box on the data sheet under the corresponding tray position. (Figure 3) 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.

Once you attain a desirable pattern (Figure 6), optimum-driving centers can be determined. To determine optimum driving centers (effective swath width), locate the points on both the left and right side of the pattern where the amount of material applied is half the amount at the center of the pattern. The distance between these two points represents the driving centers to be used.

When blended fertilizers are being applied, a visual inspection of the samples should be made to determine whether the blend within the effective swath width is consistent with the desired blend. If the blend is not consistent, a narrower overall swath width should be used and a new optimum driving center (effective swath width) should be determined.

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

**DRIVING METHODS**

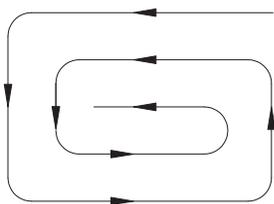


Figure 4 – Perimeter Method

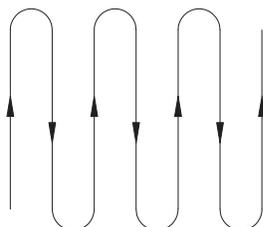


Figure 5 – Switch Back Method

The perimeter (Figure 4) and switch back (Figure 5) driving methods are both acceptable.

NOTE: Utilizing the switch back method amplifies non-symmetrical patterns by blending right side on right and left side on left. The perimeter method compensates for non-symmetrical patterns by blending the right side of the pattern with the left side of the adjacent pattern or vice versa.

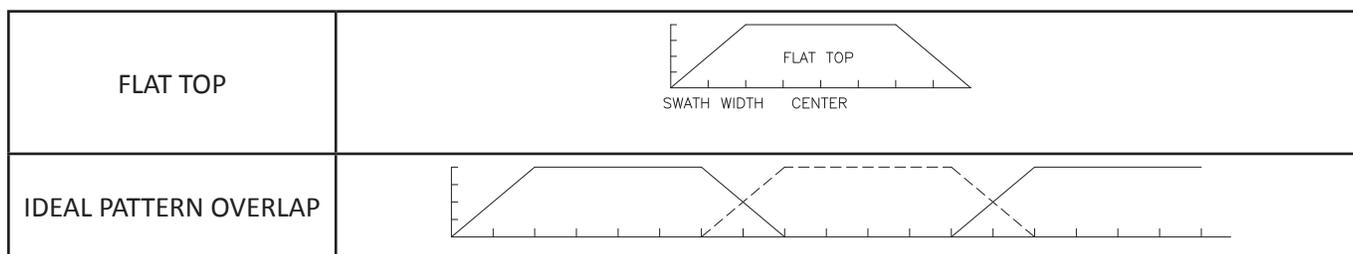


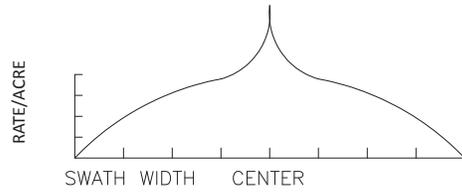
Figure 6 – Ideal Pattern

**PROBLEMS**

**PATTERNS**

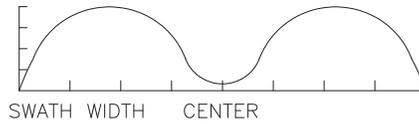
**RECOMMENDED ADJUSTMENTS**

Heavy Directly Behind the Vehicle



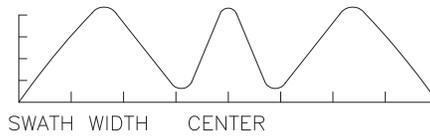
1. Move the spinner forward (toward the conveyor).
2. Decrease spinner RPM.
3. Check spinner blade quality.
4. Move one or two spinner blades to a lower numbered hole.

Light Directly Behind the Vehicle



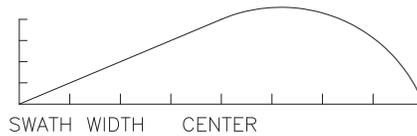
1. Move the spinner rearward (away from conveyor).
2. Increase spinner RPM.
3. Check spinner blade quality.
4. Move one of two spinner blades to a higher numbered hole.

Light Outside Vehicle's Tire Tracks



1. Check spinner blade quality.
2. Decrease spinner RPM
3. Move all blades to #2 position.

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.

**TROUBLESHOOTING**