

9000 SERIES TRIMAX



**MINIMUM FAN SPEED CHART
MANUAL**

0253-20-45

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1 Fan Speed Charts

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Important

The charts listed in the following manual were created using a Bourgault air cart and Bourgault seeding unit/distribution system. The charts listed in this manual are only accurate and valid with a Bourgault seeding system.

Changes to the Bourgault distribution system, installing a Bourgault air kit on a competitor seeding unit, or using a Bourgault tank with a competitive drill will require the end user to calculate their own minimum fan speeds needed for each product. These charts are not applicable for those scenarios.

Bourgault ships all air carts with TriMax installed, with $\frac{3}{4}$ " fan circuit hydraulic couplers, and all cross tillage hydraulic hoses with $\frac{3}{4}$ " couplers to supply the fan's hydraulic requirements. For maximum fan efficiency and RPM these couplers should not be downsized for any reason.

The stationary method listed in the **Section 1.1** was used to construct the charts listed in this manual.

Terminology

1. **Cleanout** - This is when the airstream goes from carrying product in the air stream to having only air traveling through the transfer lines.
2. **Loaded Fan Speed** - Stable fan RPM displayed when product is being metered into the distribution system.
3. **Unloaded Fan Speed** - Stable fan RPM displayed when there is no product being metered into the distribution system.
4. **Ports** - Number of manifolds feeding the drill from the Primary Manifold.

Important

Any seeding condition, including product density, product size, relative humidity, and seed treatments, can all have an effect on the Minimum Required Fan speed for any product. The charts listed herein are a guide based on optimum conditions. Operators should calculate the required fan speed using the method listed in the **Section 1.1** for any change to seeding conditions.

Important

When the metering augers are shut off, count the number of seconds that elapse until most of the product has cleared the seed boots. The interval between shutting off the augers and product coming out of the seed boots should be less than 4 seconds at the main frame (expect the odd kernel to come out for 5~10 seconds after the majority of product has cleared). If it is greater, the fan speed must be increased.

Changes in performance may occur over time due to factors including seed treatments and high humidity.

1.1 Reading Fan Charts

The following information will assist in reading the fan charts provided.

1. Verify your model and width.
2. Check your opener spacing. If unsure of the spacing, measure the distance between 2 adjacent openers, this measurement is your unit spacing.
3. Count the number of ports on the primary manifold. This is the manifold being fed by the 6" (152.4 mm) or 7" (177.8 mm) pipe from the air cart, refer to *Figure 1.1*.

4. Once you have recorded this information refer to *Figure 1.2 - Minimum Fan Speed Chart Legend* to find the charts specific to your seeding system and applied product.

Note

If you are applying a blend or there is no chart for your product please follow the instructions in *Section 1.1.2 - Determining Fan Speed For Unlisted Products* to calculate a minimum fan speed required.

5. **Example:** For a 3330-76 @ 10" spacing, with Trailing Tank - use Chart 28A - 28D, depending on the used product. Refer to *Figure 1.3 - Example - Finding The Chart Specific to Your Seeding System*.

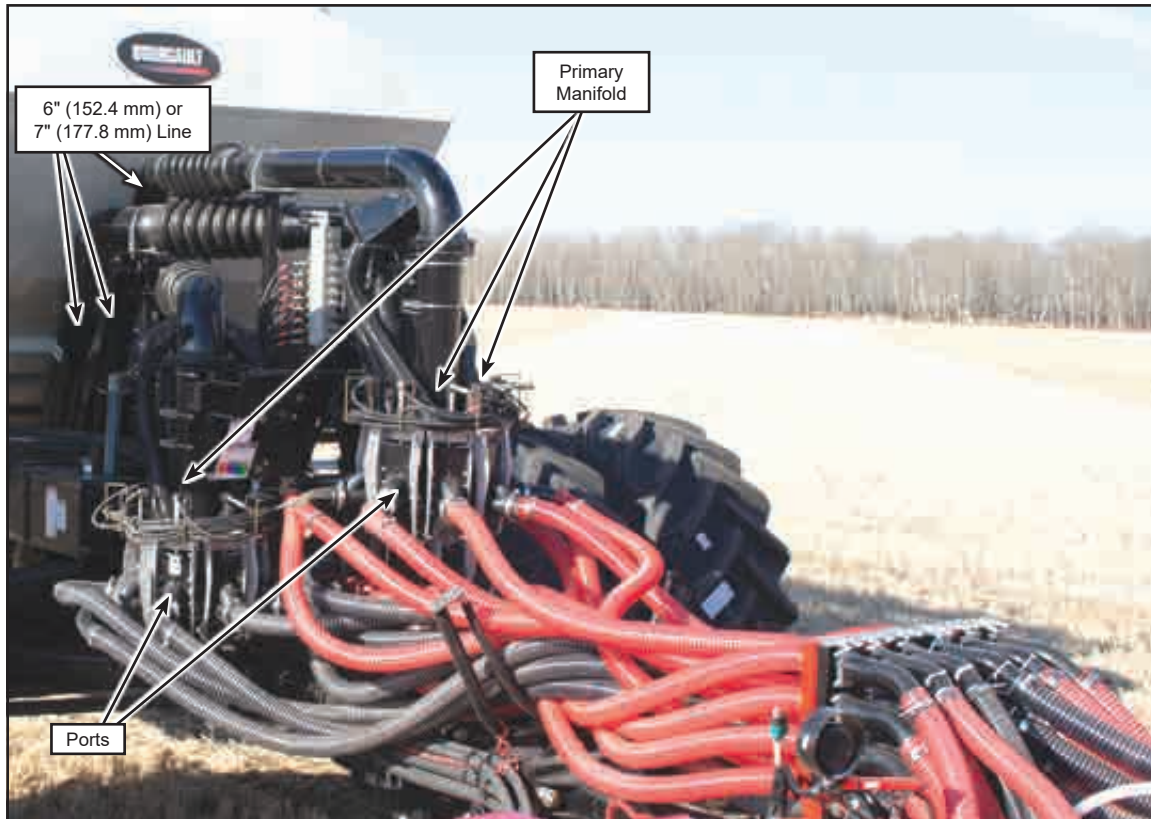


Figure 1.1 - Primary Line, Manifold and Ports - TriMax

TriMax ASC Minimum Fan Speed Chart Legend

Drill Configuration			Chart Required		
Model	Spacing	Number of Ports	Trailing Units		Leading Units
			Standard & High Speed Fan	High-Capacity Fan	Standard & High Speed Fan
333x-40	10	6	23A~23D	-	-
333x-50	10	6	23A~23D	-	-
	12	6	23A~23D	-	-
	10	8	24A~24D	-	-
	12	8	24A~24D	-	-
333x-60	10	6	25A~25D	-	36A~36D
	12	6	25A~25D	-	36A~36D
	10	8	26A~26D	-	35A~35D
	12	8	26A~26D	-	35A~35D
333x-66	10	8	27A~27D	-	33A~33D
	12	6	25A~25D	-	36A~36D
	12	8	27A~27D	-	33A~33D
333x-76	10	8	28A~28D	-	33A~33D
	12	8	28A~28D	-	33A~33D
333x-86	10	10	29A~29D	30A~30D	-
	12	10	29A~29D	30A~30D	-
3545-100	10	10	45A~45D	46A~46D	-
	12	10	45A~45D	46A~46D	-
3x20-40	7.5	8	23A~23D	-	-
	10	6	23A~23D	-	-
	12	6	23A~23D	-	-
3x20-50	7.5	8	27A~27D	-	-
	10	6	23A~23D	-	-
	12	6	23A~23D	-	-
	10	8	24A~24D	-	-
	12	8	24A~24D	-	-
3x20-60	7.5	8	28A~28D	-	35A~35D
	10	6	25A~25D	-	36A~36D
	12	6	25A~25D	-	36A~36D
	10	8	26A~26D	-	35A~35D
	12	8	26A~26D	-	35A~35D
3x20-70	10	8	28A~28D	-	33A~33D
	12	6	25A~25D	-	33A~33D
	12	8	28A~28D	-	33A~33D

Figure 1.2 - Minimum Fan Speed Charts Legend

TriMax ASC Minimum Fan Speed Chart Legend

Drill Configuration			Chart Required		
			Trailing Units		Leading Units
Model	Spacing	Number of Ports	Standard & High Speed Fan	High-Capacity Fan	Standard & High Speed Fan
333x-40	10	6	23A~23D	-	-
333x-50	10	6	23A~23D	-	-
	12	6	23A~23D	-	-
	10	8	24A~24D	-	-
	12	8	24A~24D	-	-
333x-60	10	6	25A~25D	-	36A~36D
	12	6	25A~25D	-	36A~36D
	10	8	26A~26D	-	35A~35D
	12	8	26A~26D	-	35A~35D
333x-66	10	8	27A~27D	-	33A~33D
	12	6	25A~25D	-	36A~36D
	12	8	27A~27D	-	33A~33D
333x-76	10	8	28A~28D	-	33A~33D
	12	8	28A~28D	-	33A~33D
333x-86	10	10	29A~29D	30A~30D	-
	12	10	29A~29D	30A~30D	-
3545-100	10	10	45A~45D	46A~46D	-
	12	10	45A~45D	46A~46D	-
3x20-40	7.5	8	23A~23D	-	-
	10	6	23A~23D	-	-
	12	6	23A~23D	-	-
3x20-50	7.5	8	27A~27D	-	-
	10	6	23A~23D	-	-
	12	6	23A~23D	-	-
	10	8	24A~24D	-	-
	12	8	24A~24D	-	-
3x20-60	7.5	8	28A~28D	-	35A~35D
	10	6	25A~25D	-	36A~36D
	12	6	25A~25D	-	36A~36D
	10	8	26A~26D	-	35A~35D
	12	8	26A~26D	-	35A~35D
3x20-70	10	8	28A~28D	-	33A~33D
	12	6	25A~25D	-	33A~33D
	12	8	28A~28D	-	33A~33D

Figure 1.3 - Example - Finding The Chart Specific to Your Seeding System

1.1.1 Fan Speed Interpolation for the Unlisted Ground Speeds

For ground speeds not listed on the chart, operators will have to interpolate the fan speed based on the ground speeds listed in the charts. Follow the procedure below for unloaded and loaded minimum fan speeds.

1. From the chart specific to your configuration locate the rate in lb./acre.
2. Follow where the loaded/unloaded speed curve that are above and below your intended speed crosses the rate required and record.
3. Calculate the difference from the speed you wish to travel vs the lower speed curve listed. The difference between chart lines is 1 mph and your calculated difference is the factor used to calculate the new minimum fan RPM.
4. Subtract the higher ground speed fan RPM from the lower ground speed fan RPM. Multiply this value by the speed difference factor calculated above.
5. Add this value to the lower ground speed fan RPM previously recorded. This is your fan speed.

Example (Imperial):

Minimum unloaded fan speed required to travel 5.7 mph with a 3330-76' unit, 10" spaced, 8 port and tow behind tank applying Wheat at 150 lb (168 kg). (Using *Chart 28*)

1. It is determined that *Chart 28a* is the chart specific for seeding system configuration. On the chart locate the rate - 150 lb.
2. Determine unloaded fan speed:
3. Between 5 mph and 6 mph curves Unloaded Fan speed at 5 mph and 6 mph:
 - a. 5 mph 150 lb unloaded minimum fan speed = 4030 RPM
 - b. 6 mph 150lb unloaded minimum fan speed = 4200 RPM
4. Calculate the difference between speeds:
 - a. $(5.7 \text{ mph} - 5 \text{ mph}) / (6 \text{ mph} - 5 \text{ mph}) = 0.7 \text{ mph}$
5. Change in fan RPM required:
 - a. $(4200 - 4030) \times 0.7 = 138 \text{ RPM}$
6. Calculate your fan speed:
 - a. Estimated unloaded fan speed = 4030 RPM + 138 RPM = 4168 RPM minimum no load fan speed for a ground speed of 5.7 mph
 - b. Set fan to 4200 RPM in the unloaded state (round RPM to nearest 50 RPM +/- 25 RPM).

Example (Metric):

Minimum unloaded fan speed required to travel 9.2 km/h with a 3330-76' unit, 10" spaced, 8 port and tow behind tank applying wheat at 168 kg. (Using *Chart 28*).

1. It is determined that *Chart 28a* is the chart specific for seeding system configuration. On the chart locate the rate - 168 kg.
2. Determine unloaded fan speed:
3. Between 8 km/h and 9.7 km/h curves
Unloaded Fan speed at 8 km/h and 9.7 km/h:
 - a. 8 km/h 168 kg unloaded minimum fan speed = 4030 RPM
 - b. 9.7 km/h 168 kg unloaded minimum fan speed = 4200 RPM
4. Calculate the difference between speeds:
 - a. $(9.2 \text{ km/h} - 8 \text{ km/h}) / (9.7 \text{ km/h} - 8 \text{ km/h}) = 0.7 \text{ km/h}$
5. Change in fan RPM required:
 - a. $(4200 - 4030) \times 0.7 = 138 \text{ RPM}$
6. Calculate your fan speed:
 - a. Estimated unloaded fan speed = 4030 RPM
+ 138 RPM = 4168 RPM minimum no load fan speed for a ground speed of 9.2 km/h
 - b. Set fan to 4200 RPM in the unloaded state (round RPM to nearest 50 RPM +/- 25 RPM).

1.1.2 Determining Fan Speed For Unlisted Products

Listed in *Figure 1.4* are several common products that do not have fan charts, along with the recommended minimum fan chart that can be used as a starting point. If there is no product listed please go to instructions below and follow the procedure to get the minimum fan speed required.

Note

These are recommended charts to follow. Operators should go through the procedure below if there is any concern with the minimum fan speed required.

In order to calculate the minimum fan speed for blended products, or products not listed on the charts please use the following formula:

1. Calculate the total amount of product to be applied, (in pounds/acre).
2. For any product in the blend that has a chart listed in the following pages, look at the chart and find the loaded fan speed required for the **Total Product** to be applied and write it down.
3. For all products that do not have a chart listed in this document select a product that is the closest match to what you wish to apply for your unit and do the same as in *step 2*.
4. Calculate the percentage of each individual product in the blend and multiply that percentage by the fan speed recorded previously for each product.
5. Add the weighted fan speeds together from each product and the result will be your initial loaded fan speed.
6. Repeat *steps 1 - 5*, to calculate the unloaded minimum fan speed required for the same rate required. This will provide the initial starting point.

Important

Do not exceed 6000 RPM with the High-Speed fan.

Product	Recommended Chart to Follow
11-0-0-50	11-51-00
20-00-00-24	46-0-0

Figure 1.4 - Recommended Chart to Follow for Non Listed Products

Example (Imperial):

Applying a blend of 150 lbs. Wheat and 50 lbs. 11-51-0-0 at 5 mph with a 3330-76 unit with 10" spacing, 8 port, and a trailing air cart.

Using *Figure 1.2* (if required) and *Chart 28* to calculate fan speed.

1. Total Product:
 - a. 150 lbs. + 50 lbs. = 200 lbs.
2. Loaded fan RPM:
 - a. Wheat @ 200 lbs.: 4750 RPM
 - b. 11-51-00 @ 200 lbs.: 5430 RPM
3. Percentage of each product:
 - a. 150 lbs. Wheat / 200 lbs. total = 75%
 - b. 50 lbs. 11-51-0-0 / 200 lbs. total = 24%
4. Estimated loaded fan speed
 - a. $(75\% \times 4750) + (24\% \times 5430) = 4920$ RPM
minimum loaded minimum fan speed for this blend.
 - b. Initial loaded fan RPM should be 4900 RPM (round RPM to nearest 50 RPM +/- 25 RPM).

Example (Metric):

Applying a blend of 168 kg. wheat and 56 kg. 11-51-0-0 at 8 km/h with a 3330-76 unit with 10" spacing, 8 port, and a trailing air cart.

Using *Figure 1.2* (if required) and *Chart 28* to calculate fan speed.

1. Total Product:
 - a. 168 kg. + 56 kg. = 224 kg.
2. Loaded fan RPM:
 - a. Wheat @ 224 kg.: 4750 RPM
 - b. 11-51-00 @ 224 kg.: 5430 RPM
3. Percentage of each product:
 - a. 168 kg. wheat / 224 kg. total = 75%
 - b. 56 kg. 11-51-0-0 / 224 kg. total = 24%
4. Estimated loaded fan speed
 - a. $(75\% \times 4750) + (24\% \times 5430) = 4920$ RPM
minimum loaded minimum fan speed for this blend.
 - b. Initial loaded fan RPM should be 4900 RPM (round RPM to nearest 50 RPM +/- 25 RPM).

1.2 Troubleshooting

If you experience plugging or that the fan cannot achieve the loaded minimum fan RPM required perform one of the following stationary tests.

1.2.1 Stationary Test if System Plugs

The stationary method should be used any time you experience issues with the air system delivering product.

Note

Each airstream must be checked separately.

1. Verify that augers for the tanks you are testing are charged and full of product.
2. With the unit stationary and the openers out of the ground, set the fan RPM at your anticipated unloaded RPM required.
3. Engage the metering augers from the tanks you are applying product from, (utilizing the control box on the side of the tank), for that airstream.
4. Meter product until the fan RPM stabilizes at the loaded RPM, approximately 5~10 seconds minimum. If after one minute the fan speed has not stabilized and is still increasing, shut off the metering augers, allow the system to clean out and retest with a higher unloaded fan speed.
5. Shut off the metering augers.
6. Count the number of seconds that elapse until product stops coming out of the seed boots at the mainframe. (This is when the majority of product stops – expect the odd kernel to come out for 5~10 seconds beyond the majority of product stopping).

7. If the interval between shutting off the augers vs product coming out of the seed boots is greater than 4 seconds, the unloaded fan speed must be increased.
8. Repeat the above process until the interval is below 4 seconds. The RPM that has a clean out of less than 4 seconds is your required minimum fan RPM for this product.

Note

Measure fan speed against your acceptable seed bounce. Be sure to use enough fan RPM to meet the 4 second minimum cleanout.

Important

Excessive fan speed can result in premature hose wear, seed damage, and the potential for abnormally higher percentage of seed bounce.

1.2.2 Stationary Test if Minimum Loaded Fan Speed is Unachievable

Note

Each airstream must be checked separately.

1. Verify that augers for the tanks you are testing are charged and full of product.
2. With the unit stationary and the openers out of the ground, set the fan RPM at the maximum unloaded fan speed available.
3. Engage the metering augers from the tanks you are applying product from, (utilizing the control box on the side of the tank), for that airstream.
4. Meter product until the fan RPM stabilizes at the loaded RPM, (5~10 seconds minimum). If after 1 minute the fan speed has not stabilized and is still increasing, shut off the metering augers, allow the system to clean out and retest with a lower ground speed or with less total product. Continue to next step if the fan speed is stable.
5. Shut off the metering augers.
6. Count the number of seconds that elapse until product stops coming out of the seed boots at the mainframe. (This is when the majority of product stops – expect the odd kernel to come out for 5~10 seconds beyond the majority of product stopping).
7. If the interval between shutting off the augers vs product coming out of the seed boots is greater than 4 seconds, the seeding speed will need to be decreased or the total amount of product being applied will need to be lowered.
8. Repeat the above process until the interval is below 4 seconds. The RPM that has a clean out of less than 4 seconds is your required minimum loaded fan RPM for this product.
9. The stationary method should be used any time you experience issues with the air system delivering product.

1.3 EvenStream Primary Inspection

1.3.1 Inspection

Information in this section will assist you in the inspection of the EvenStream primary and inserts. The instructions below are for both the Single Shoot and Double Shoot side primary's and for ASC and NON-ASC models as noted.

For terminology and location of components used in the content please refer to *Figure 1.5*.

Important

A trailing unit is shown in *Figure 1.5*.

Leading units are similar, but use a Urethane coupler instead of the bellows shown.

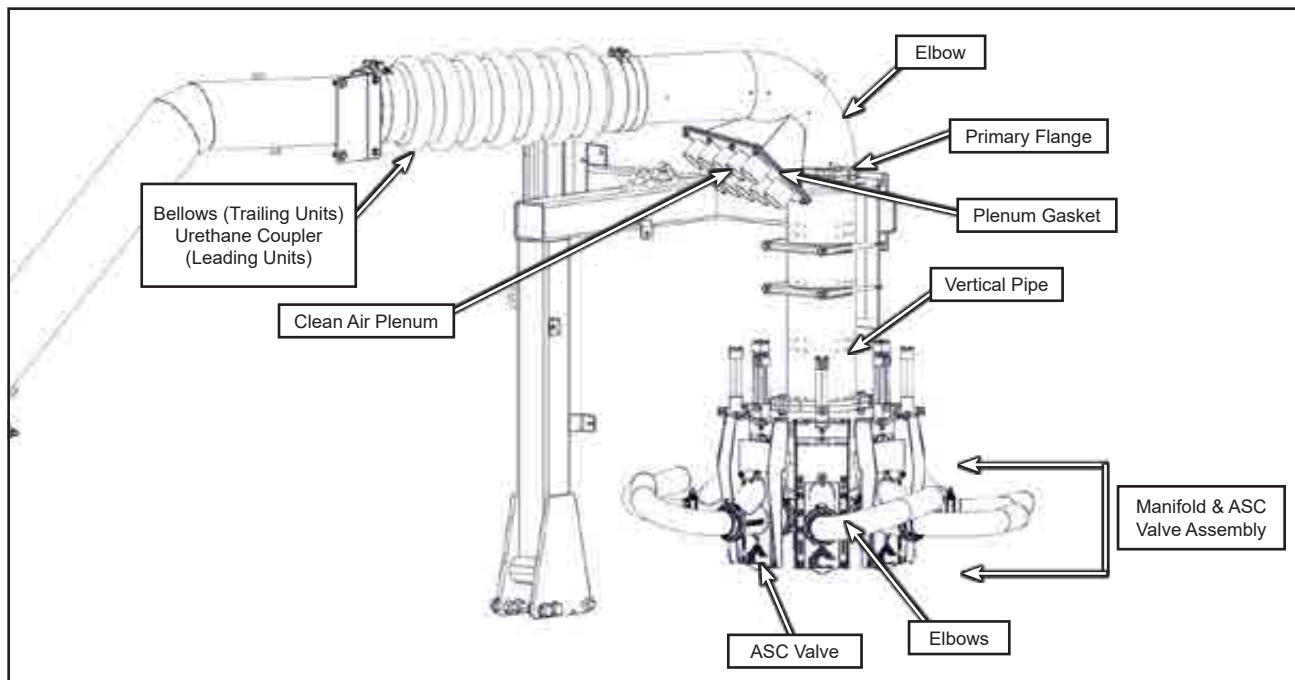


Figure 1.5 - EvenStream Primary Components

1.3.1.1 Check Primary Alignment - Trailing Units ONLY

There are 2 methods to get the unit prepared for primary alignment, either method will work to provide good results.

Method 1:

1. Verify that the front hitch is centered. Check that measurements labelled "X" in *Figure 1.6* are equal.
2. Check that the front axle is level (unit is parked on level ground).
3. This was how the unit was aligned at the factory and will allow for the primary to be aligned successfully.

Method 2:

1. Select units will "dog track" slightly when being pulled straight down the field.
 - a. In this case the hitch will not be square to the frame.
2. For optimal alignment of the primary in operation, it is recommended to pull the unit ~100 feet (30 m) in a straight line and park on level ground prior to inspecting the primary.

1.3.1.2 Dis-Assembly

1. Remove clean air plenum bolts and plenum cover from the primary and rest the assembly off to the side.
 - a. Be careful not to tear the gasket while removing, (ASC units only).
 - b. Refer to *Figure 1.7*.

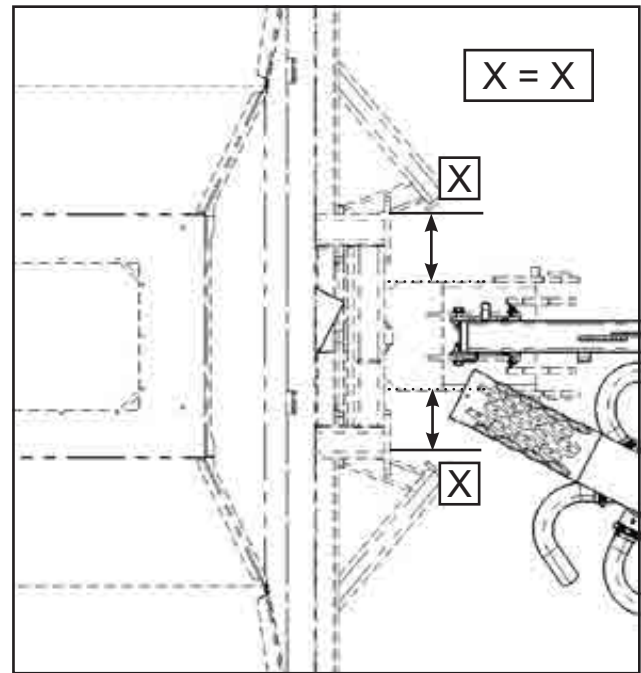


Figure 1.6 - Front Hitch - Centered

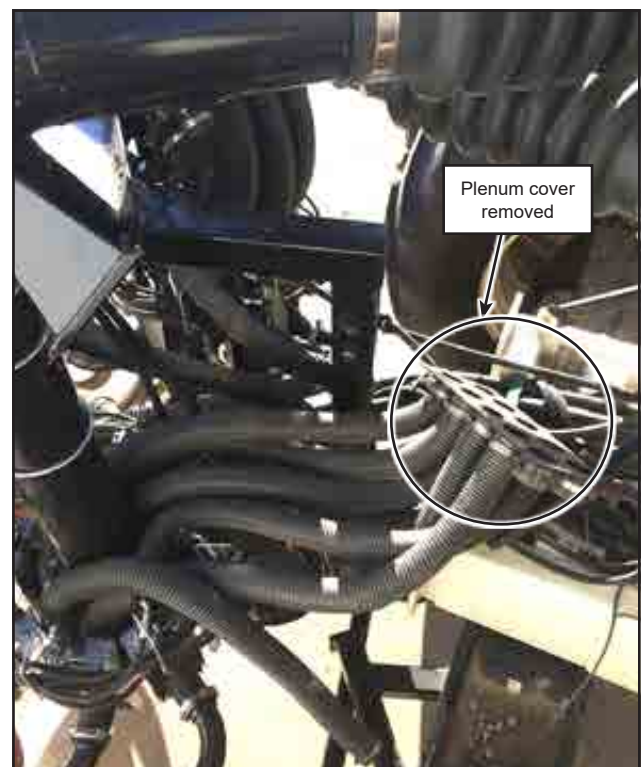


Figure 1.7 - Clean Air Plenum Removed

2. Mark the primary flange in two locations, 90° apart, one on the front of the primary flange and the other on the bolted side of the flange.
Refer to *Figure 1.8*.

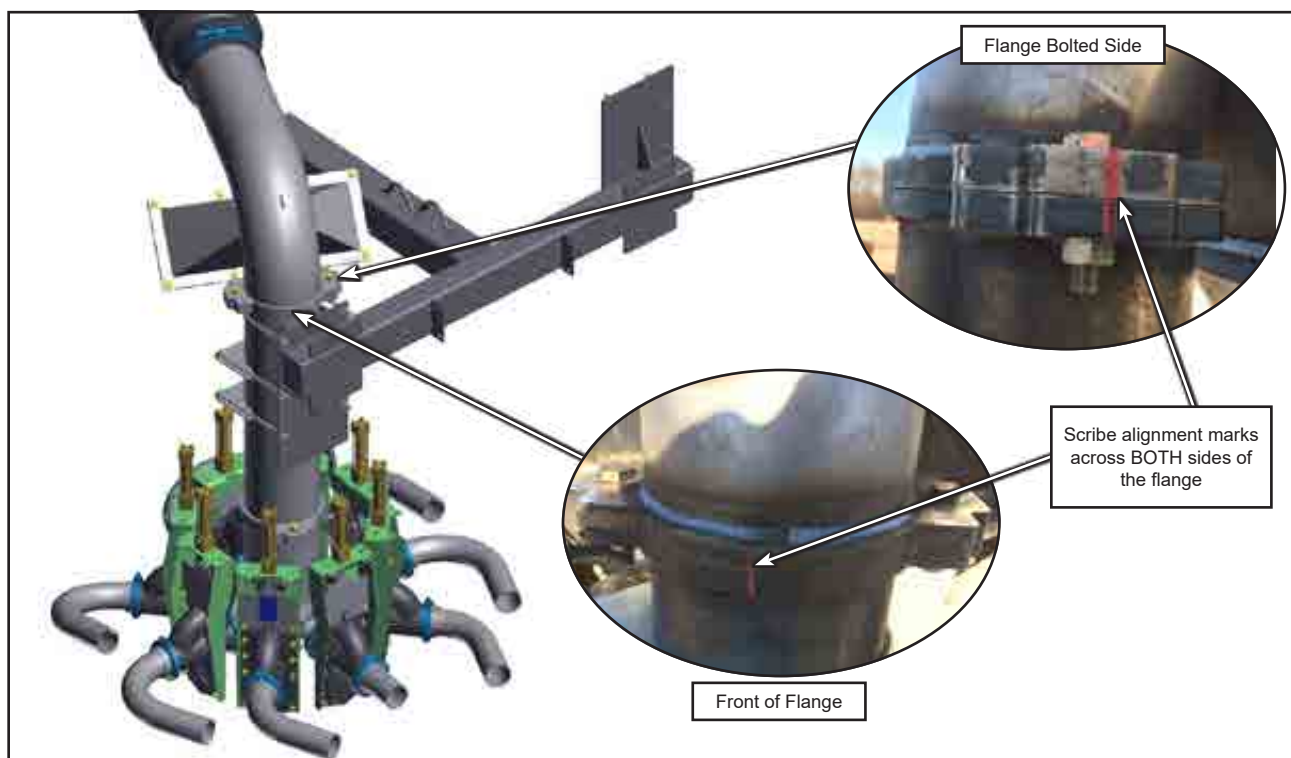


Figure 1.8 - Primary Flange - Marking

3. Loosen the two bolts securing the elbow to the vertical pipe. leading primary air kits only:
 - i. Loosen the clamps holding the urethane coupler and slide the coupler back onto the s-pipe.
 - ii. Loosen the 2 bolts securing the elbow to the vertical pipe.

Note

For trailing units only, use caution as the bellows has some preload and may pop off when the bolts are removed.

4. There is a spigot inside the pipe that will assist in holding the elbow in place. Refer to *Figure 1.9*. Not applicable for Leading units.



Figure 1.9 - Spigot Location

5. Lift the elbow off of the vertical pipe and allow it to hang on the bellows. Refer to *Figure 1.10*.
 - a. Leading primary air kits only:
 - i. Lift the elbow off of the vertical pipe and set down, be careful not to damage the elbow.



Figure 1.10 - Elbow Removed from Vertical Pipe

1.3.1.3 Inspection

1. Inspect the inserts from the top of the pipe for any for buildup of product between the ribs and clean as required. Refer to *Figure 1.11*.
2. Inspect the inside of the insert and determine if the wear is normal or excessive. Refer to *Figure 1.13*.
3. To confirm that the insert needs to be replaced, measure the diameter of the ribs.
4. This ID should not exceed $\varnothing 5\text{-}31/32''$ (152 mm). Refer to *Figure 1.12*.
 - a. If it measures below $5\text{-}31/32''$ (152 mm) the inserts are acceptable for use.
 - b. If the measurement is larger than specification the inserts must be replaced for optimum performance of the distribution system.



Figure 1.11 - EvenStream Insert Inspection

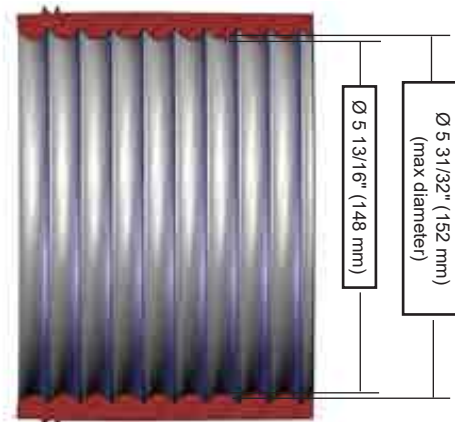


Figure 1.12 - Rib Diameter

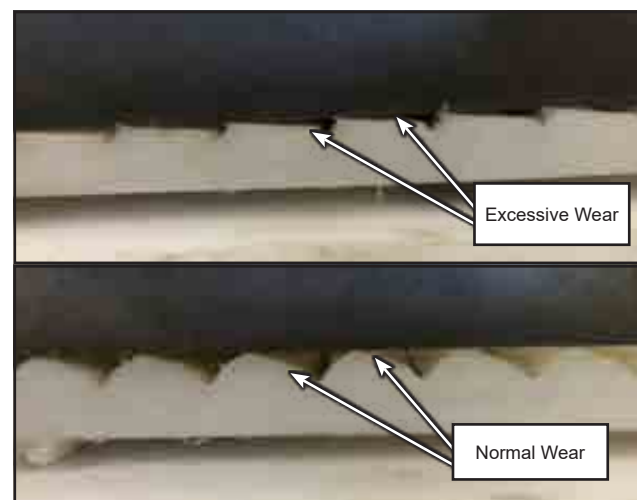


Figure 1.13 - Wear Patterns

5. To replace the inserts, the primary manifold will have to be unbolted from the bottom of the vertical pipe. Refer to *Figure 1.14*.
 - a. Place supports under the manifold.
 - b. Use sawhorses/or suitable blocking.
 - c. Loosen and remove the bolts shown in *Figure 1.14*.

Note

On ASC units the manifold/ASC valve assembly is heavy. Use proper care when removing.

6. If the ASC valves are removed be sure they are marked for correct reassembly.
 - a. On both ASC and NON ASC units, if removing the elbows, be sure they are properly marked for proper reassembly.
7. Once the manifold is removed, the inserts can be driven out of the vertical pipe, from the top down with a block and hammer.

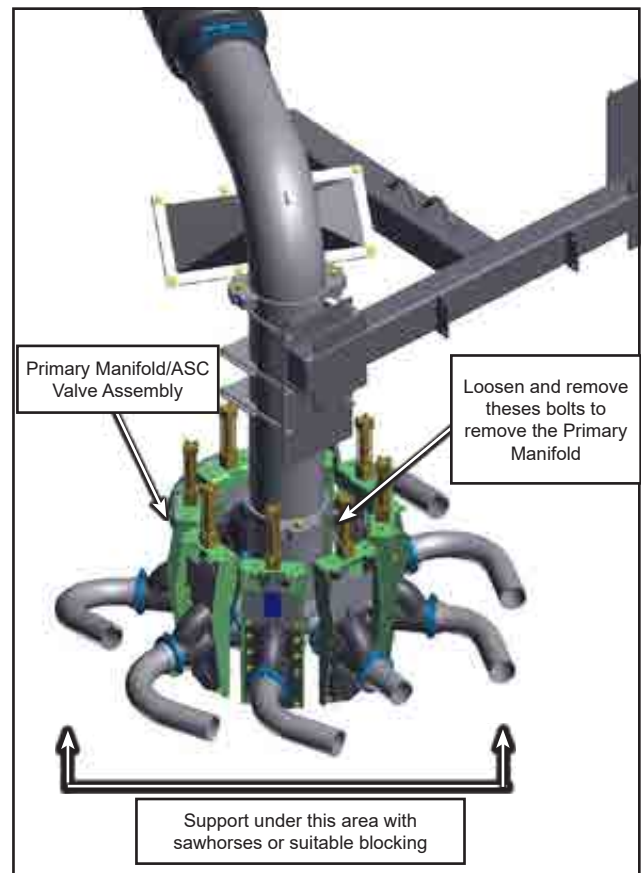


Figure 1.14 - Primary Manifold - Removal

1.3.1.4 Re-Installation of Components

1. Refer to *Section 1.3.1.1 to 1.3.1.3* for correct orientation of the manifold/elbows before starting re-assembly.
2. Re-connect the primary manifold/ASC Valve assembly that was removed.
 - a. Ensure the bolts are tightened and that the alignment is correct.
3. Install the elbow following the instructions below:
 - a. Lift the elbow/bellows assembly back onto the vertical pipe.
 - b. Trailing units only:
 - i. Apply force to the assembly, towards the bellows, to get the elbow back onto the vertical pipe.
 - c. Apply force to the assembly, towards the bellows, to get the elbow back onto the vertical pipe.
 - d. There is a 1/8" (3.2 mm) spigot on the vertical pipe that the elbow will lock over top of. Refer to *Figure 1.15*.
 - e. Install the two mounting bolts and snug up so the elbow will still move by hand.
 - f. Check the alignment marks made in step 3 and adjust the elbow as needed to get the orientation correct. Refer to *Figures 1.16 & 1.17*.

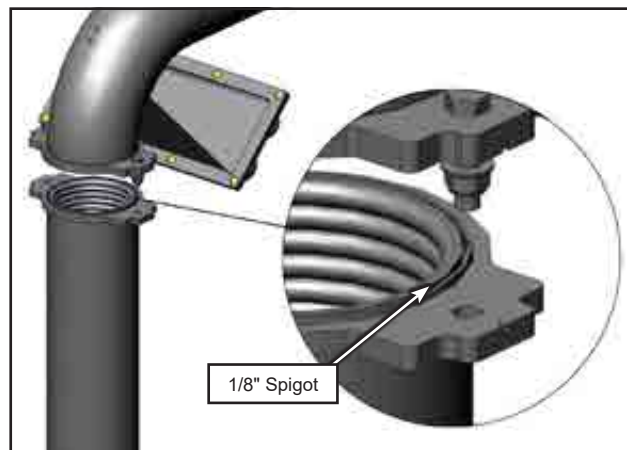


Figure 1.15 - Spigot Location

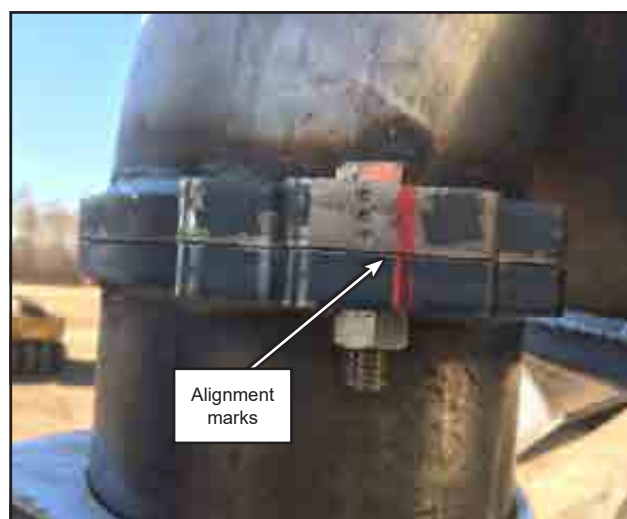


Figure 1.16 - Bolted Side Flange Scribe Marks

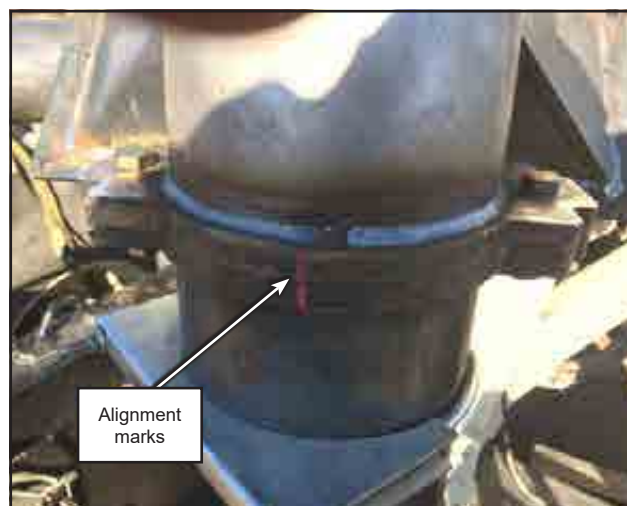


Figure 1.17 - Front of Flange Scribe Marks

4. Tighten all mount bolts to 50 FTLB (67 N-m).
5. Leading primary air kits only:
 - a. Slide urethane coupler back onto the elbow.
 - b. Be sure to center the coupler between the s-pipe and elbow.
 - c. Tighten the 2 clamps
6. For ASC units inspect the clean air plenum gasket to be sure it is still fit for use, (no rips or tears).
 - a. Reinstall gasket and plenum cover.
 - b. Tighten all hardware.

1.3.2 Primary Manifolds & Elbows, Clean Air Layout, Secondary Hose Connection

1.3.2.1 6 Port Configuration

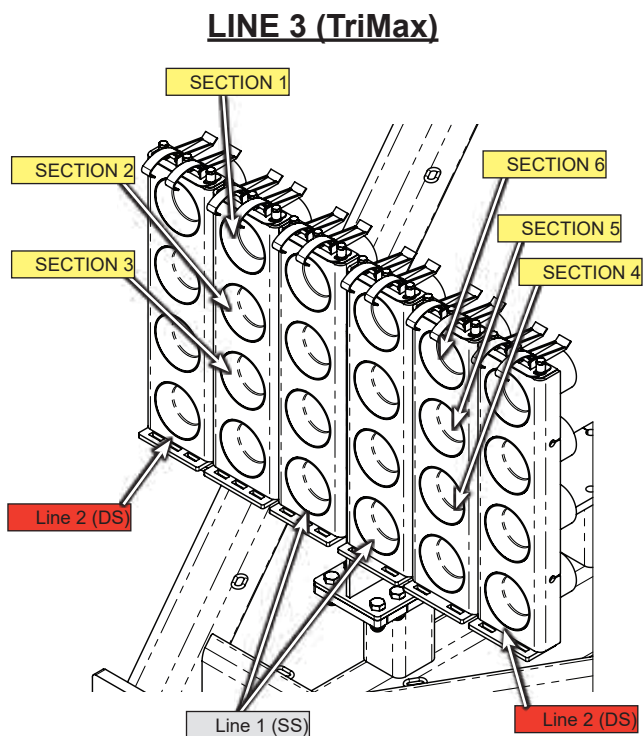


Figure 1.18 - Section Numbering - 6 Port

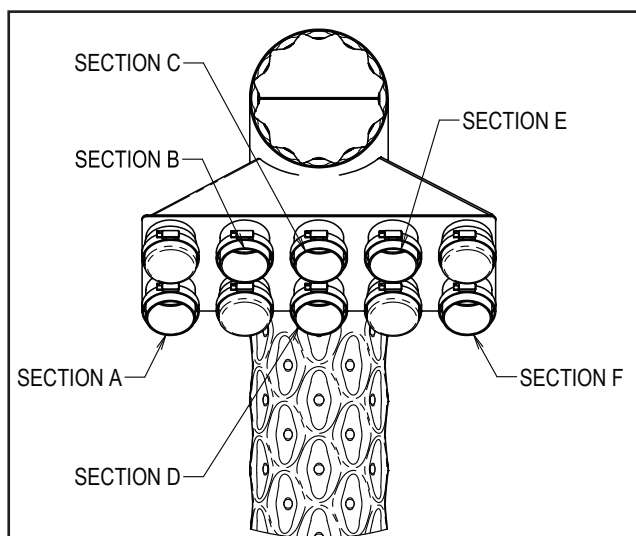


Figure 1.20 - Clean Air Connections - 6 Port

Section On Drill	Port On Primary Manifold
1	A
2	D
3	B
4	E
5	C
6	F

Note

The air drill sections are numbered from left to right. Left and right are determined by standing "behind" the unit and facing in the direction of travel.

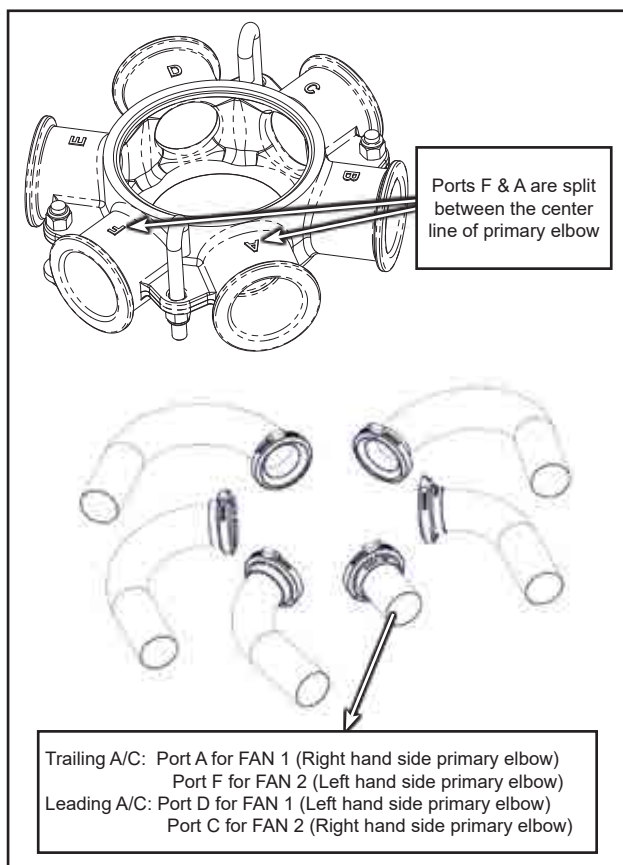


Figure 1.19 - Primary Manifold Head & Elbows - 6 Port

1.3.2.2 8 Port Configuration

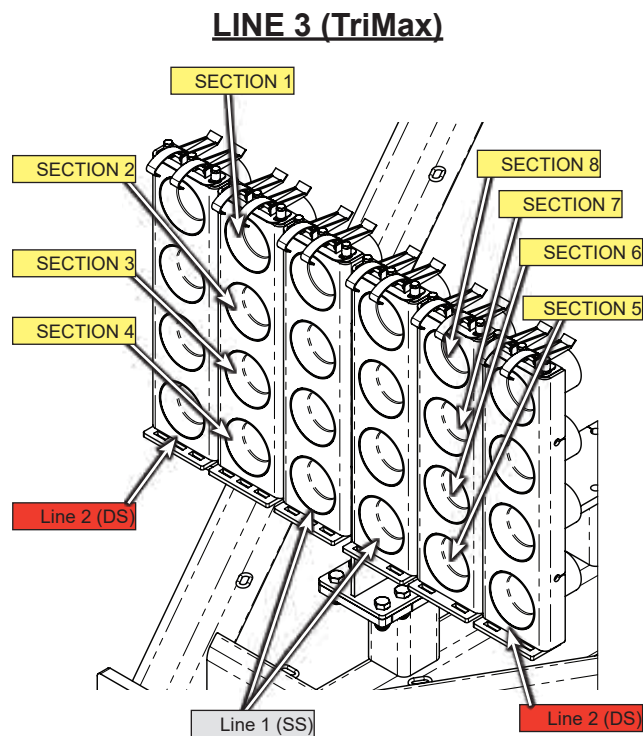


Figure 1.21 - Section Numbering - 8 Port

Section On Drill	Port On Primary Manifold
1	A
2	E
3	C
4	G
5	B
6	F
7	D
8	H

Note

The air drill sections are numbered from left to right. Left and right are determined by standing "behind" the unit and facing in the direction of travel.

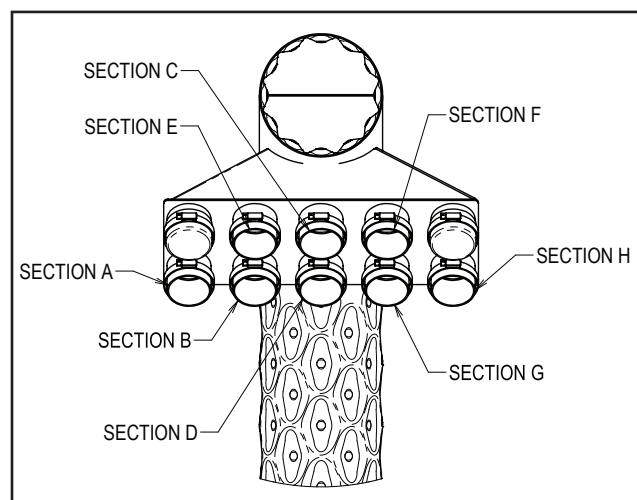


Figure 1.23 - Clean Air Connections - 8 Port

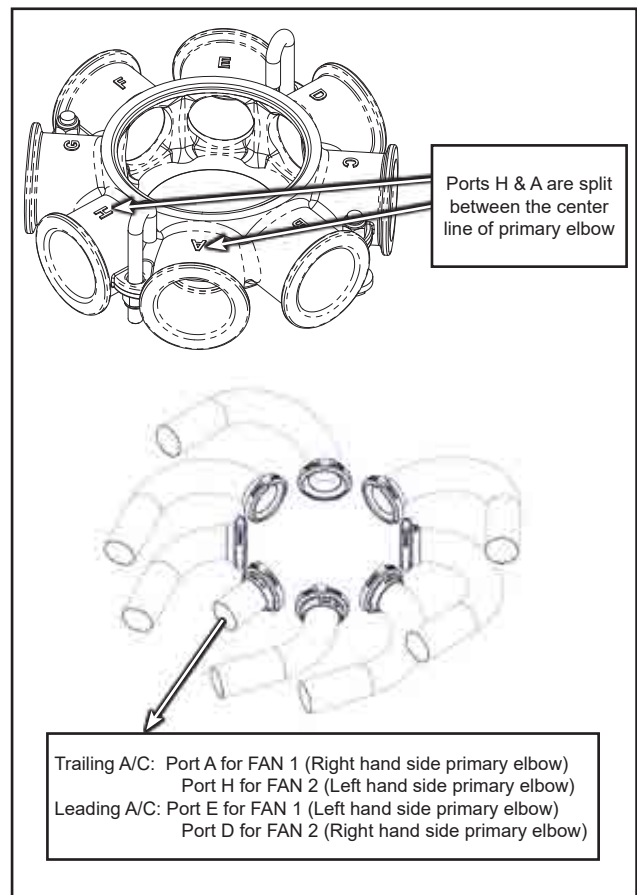
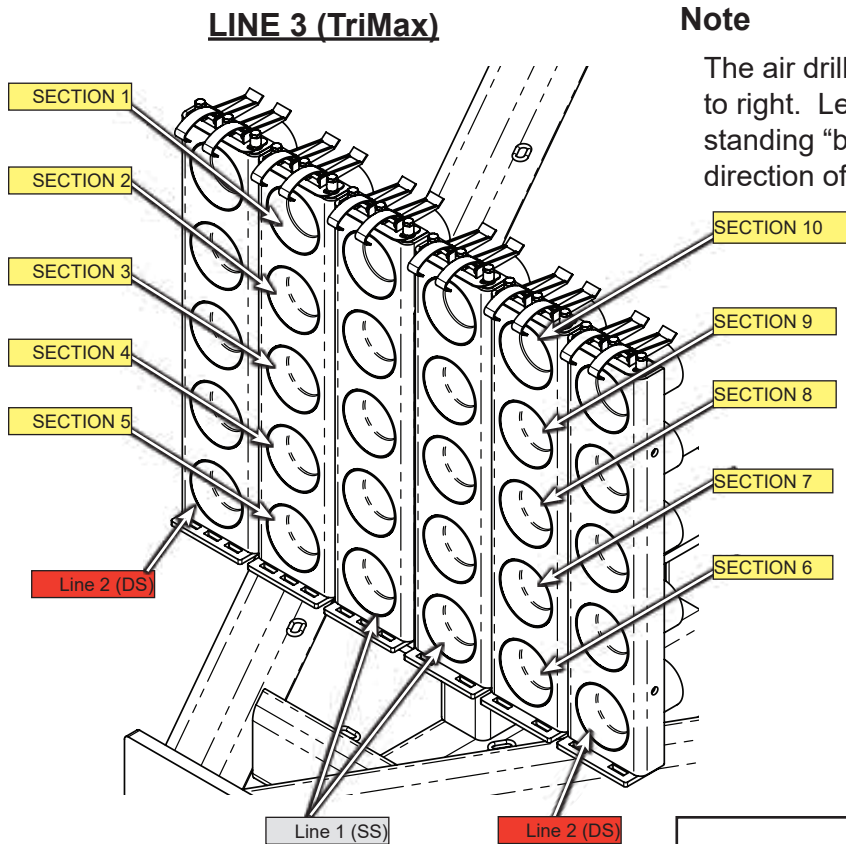


Figure 1.22 - Primary Manifold Head & Elbows - 8 Port

1.3.2.3 10 Port Configuration

**Note**

The air drill sections are numbered from left to right. Left and right are determined by standing "behind" the unit and facing in the direction of travel.

Section On Drill	Port On Primary Manifold
1	A
2	F
3	C
4	H
5	D
6	I
7	B
8	G
9	E
10	J

Figure 1.24 - Section Numbering - 10 Port

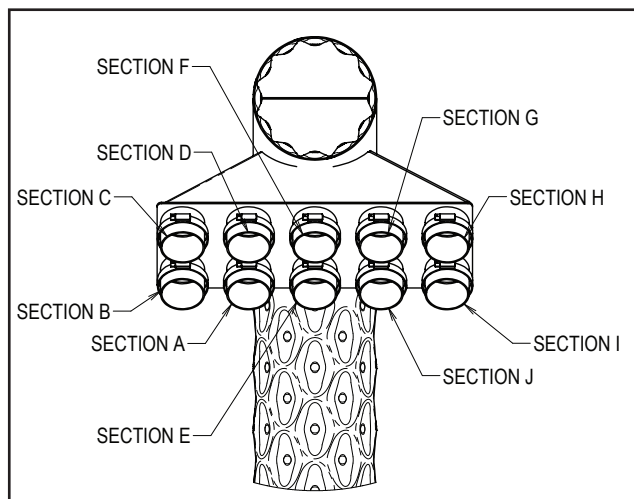


Figure 1.27 - Clean Air Connections - 10 Port

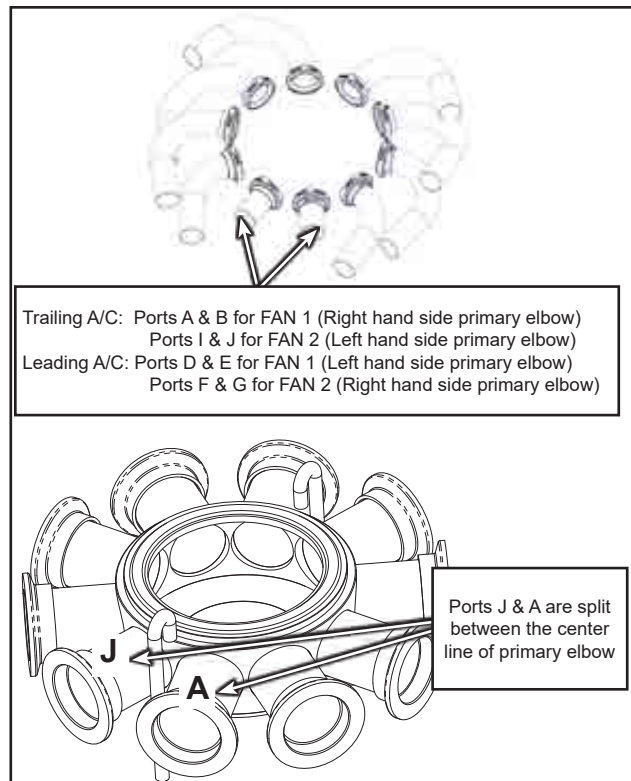
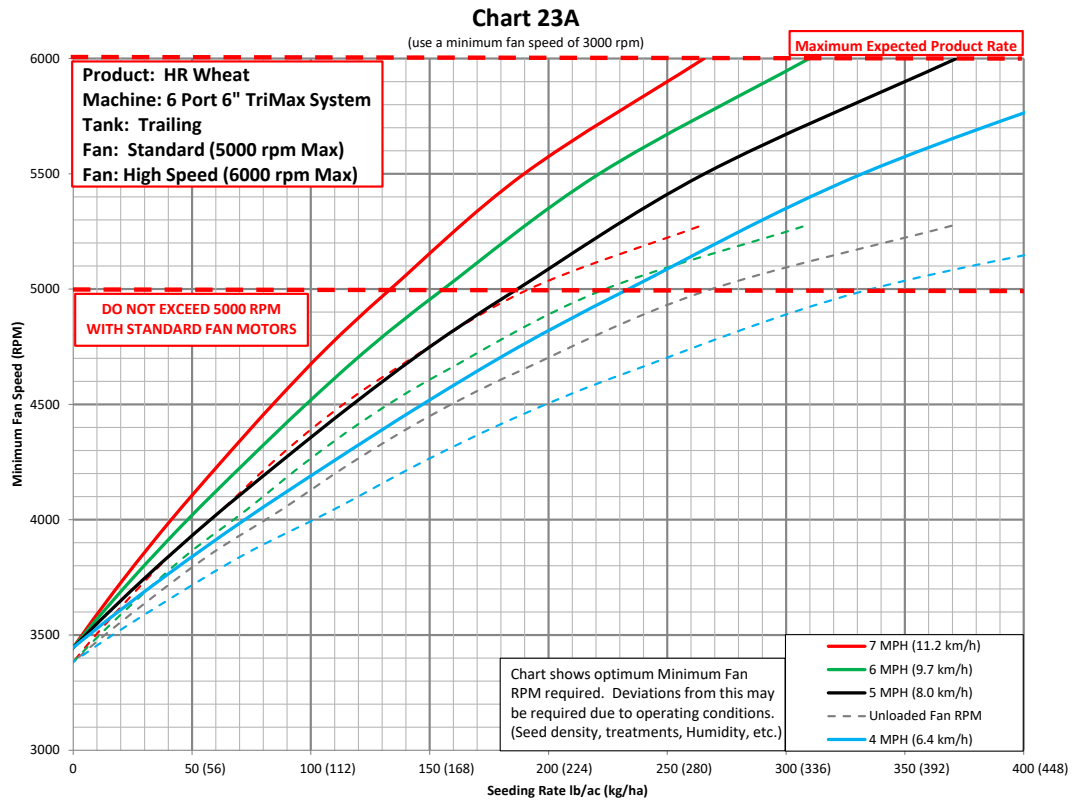
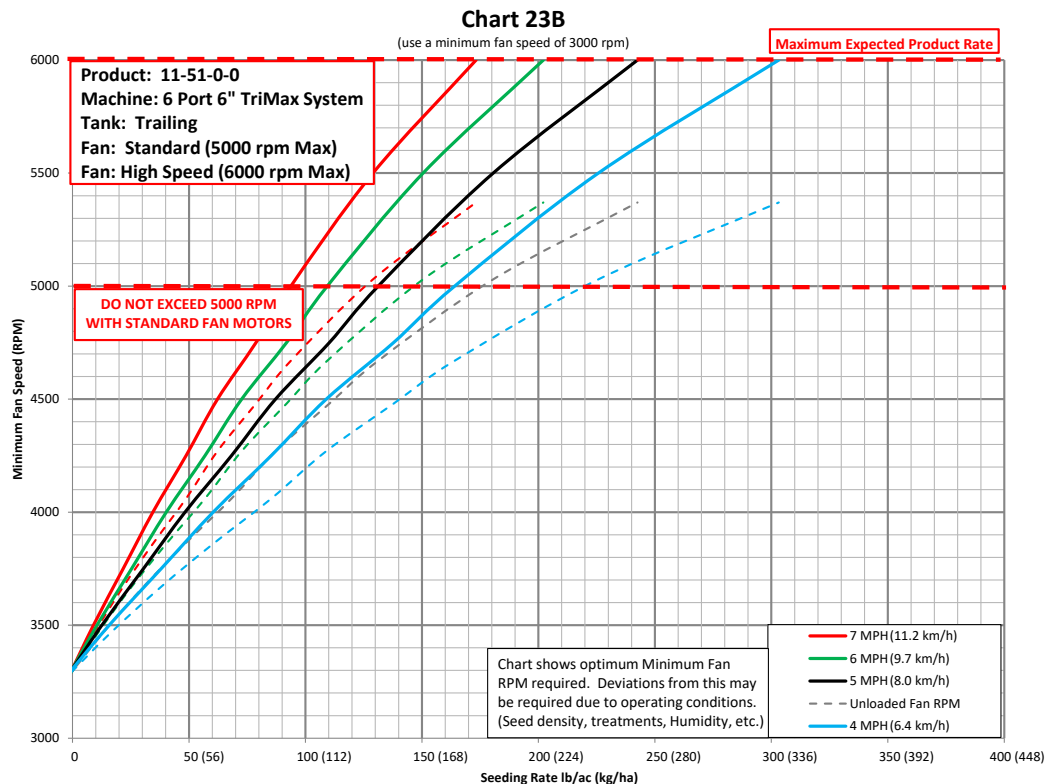


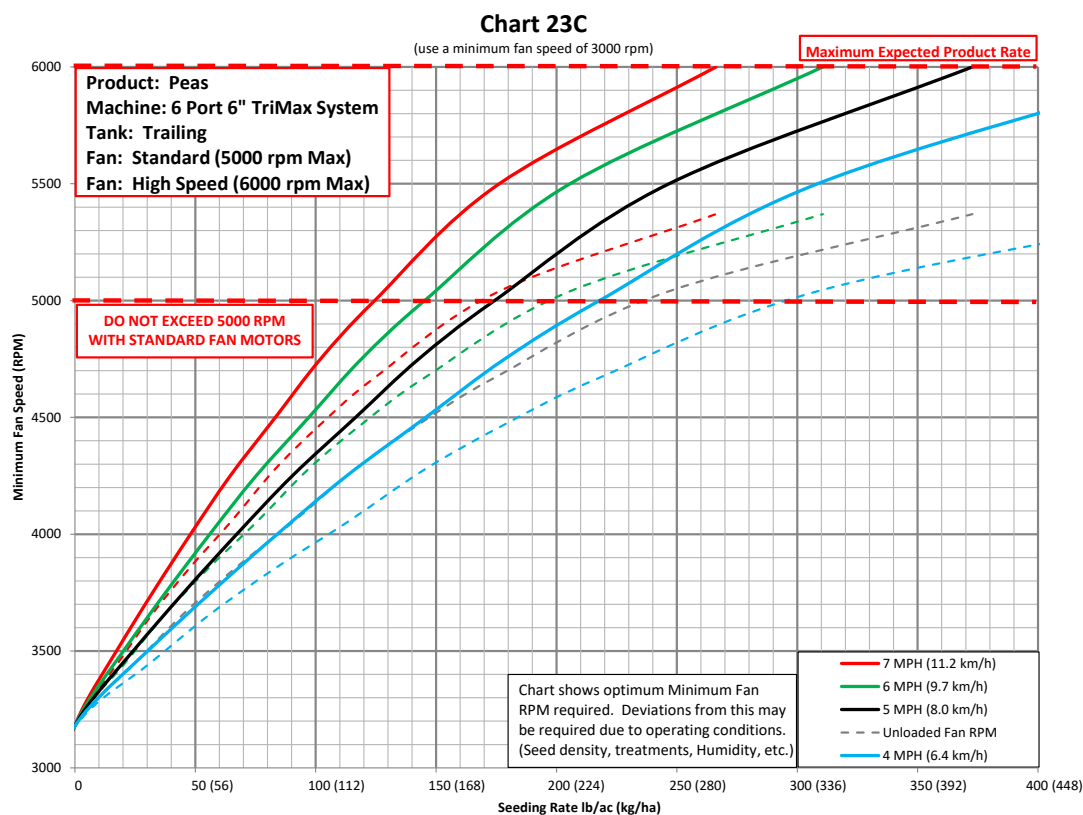
Figure 1.26 - Primary Manifold Head & Elbows - 10 Port

2 Trailing Air Cart Charts

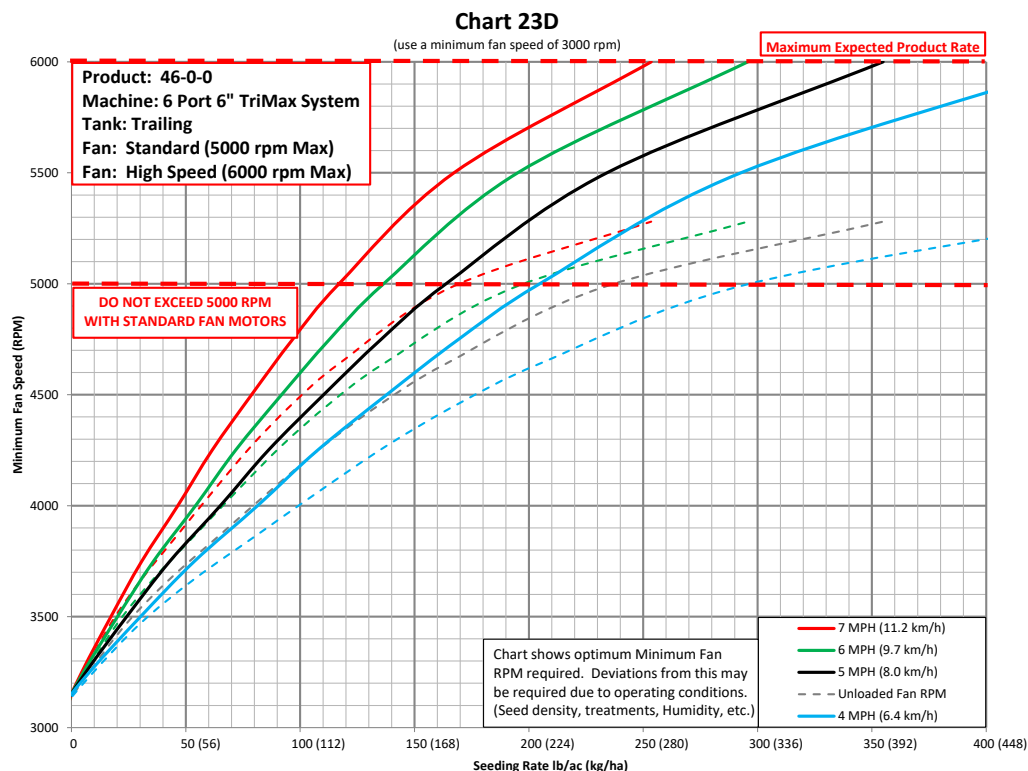


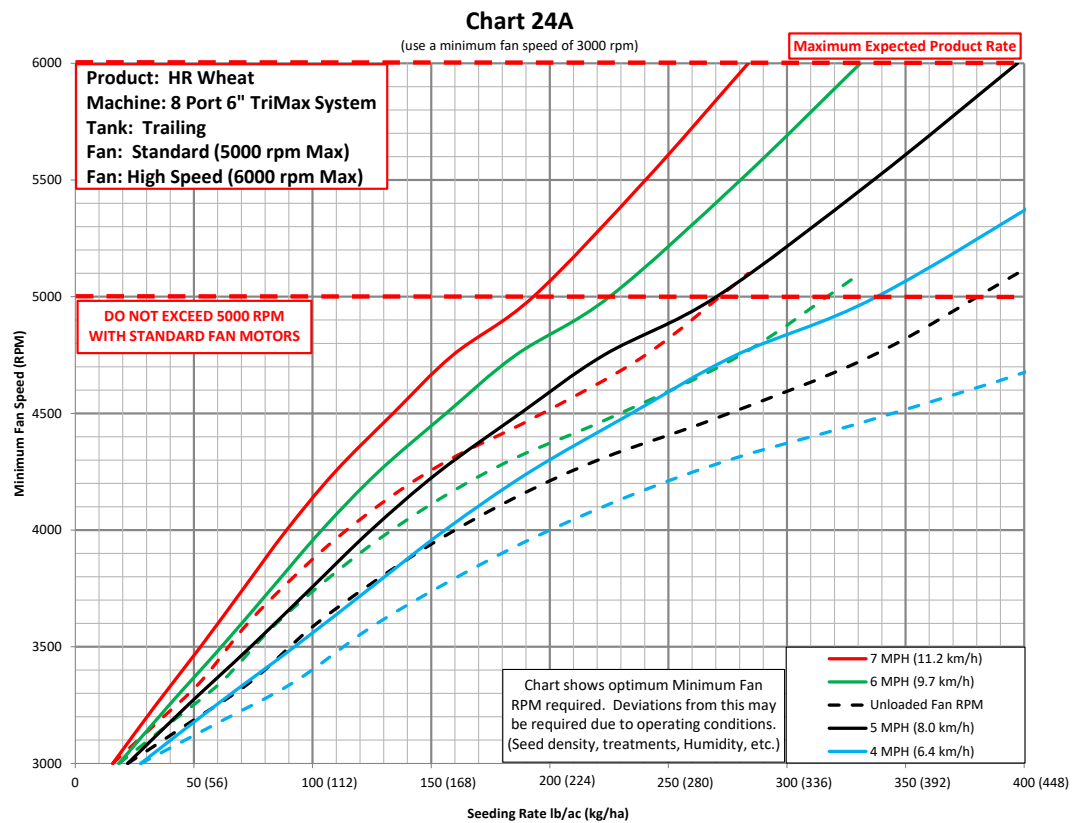
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.



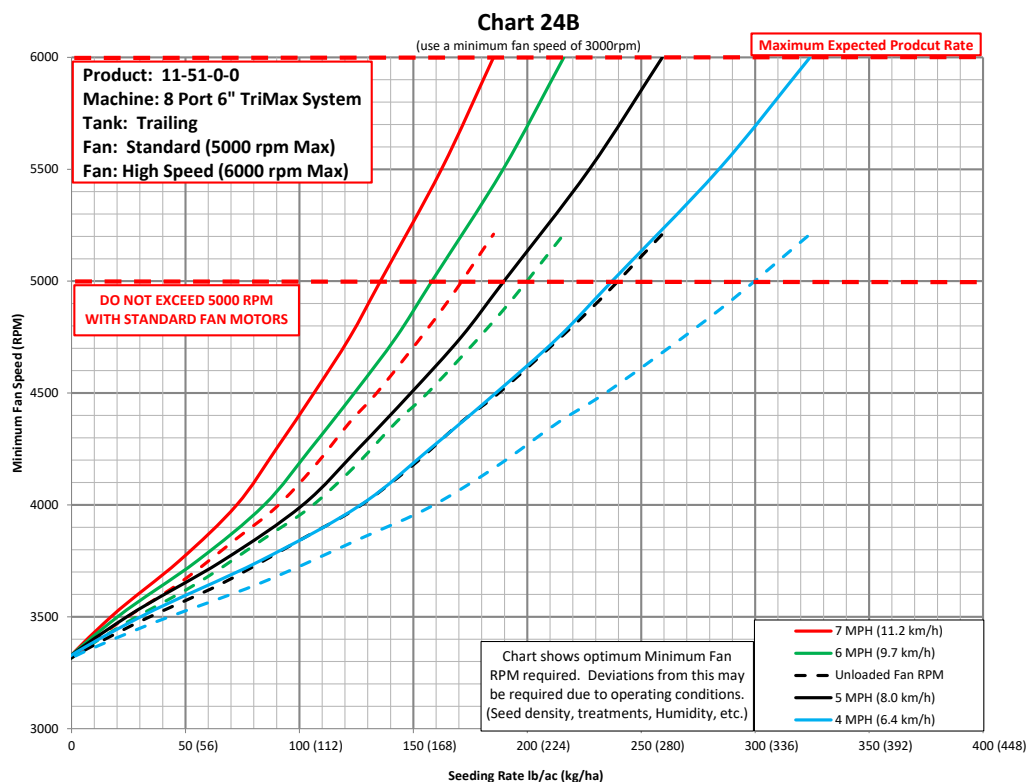


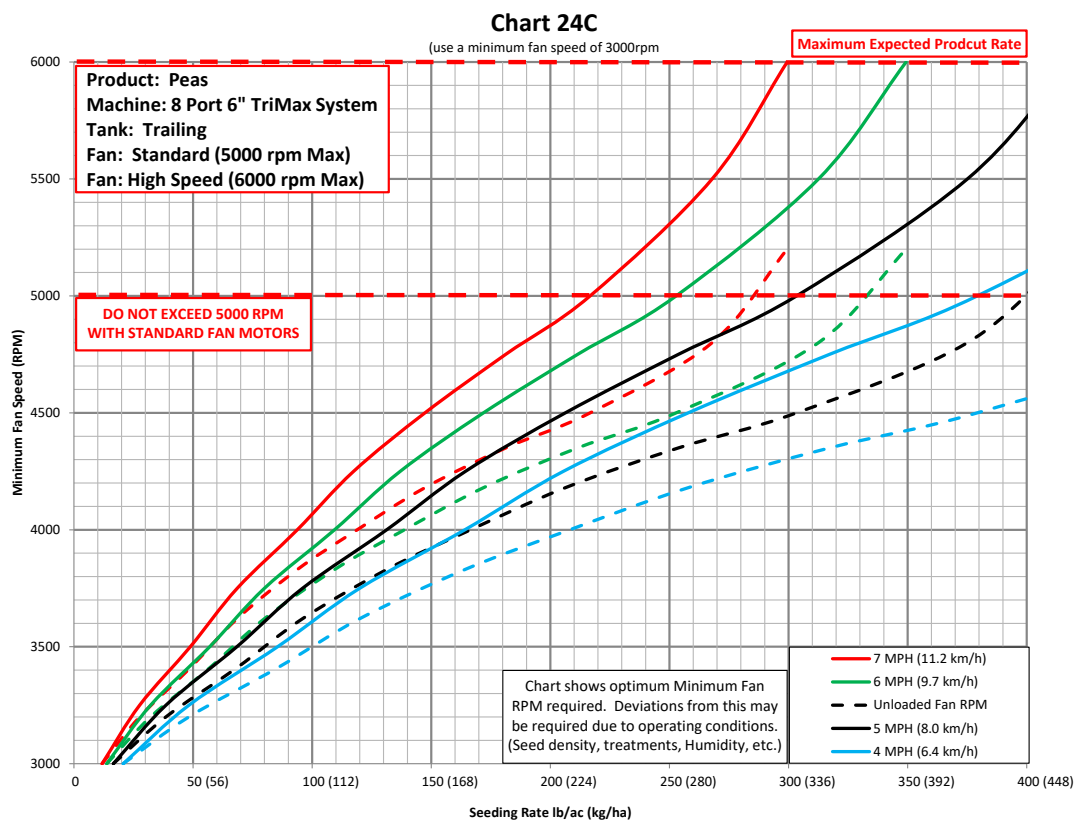
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.



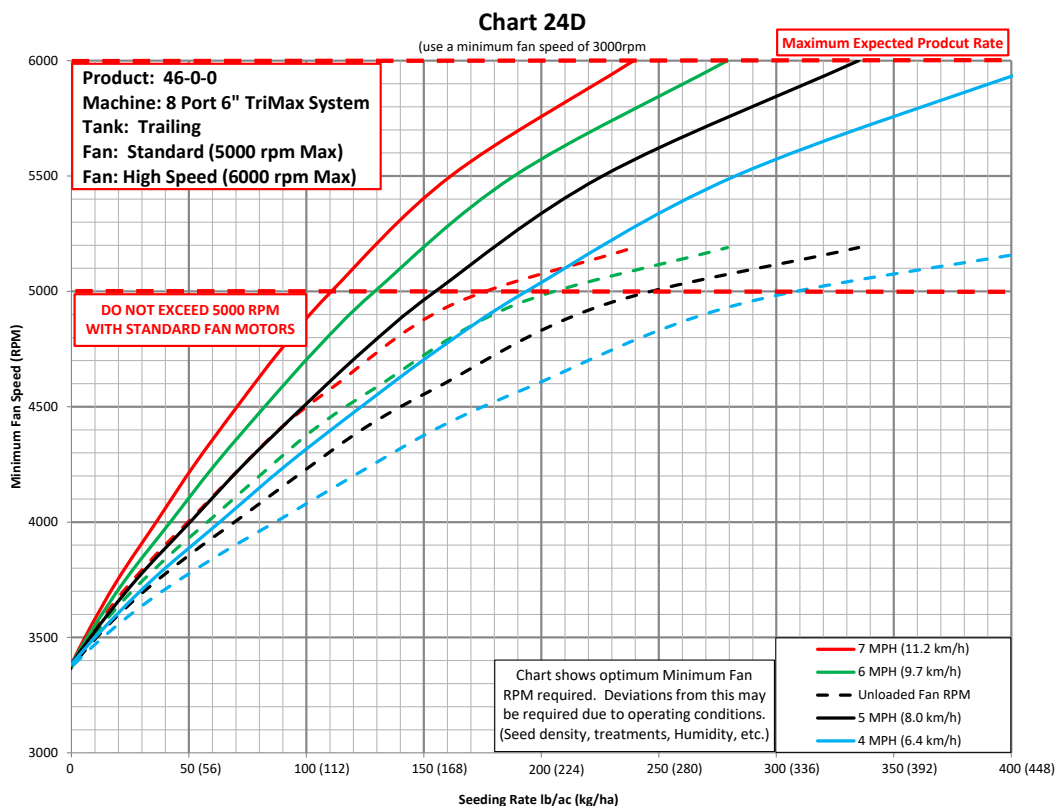


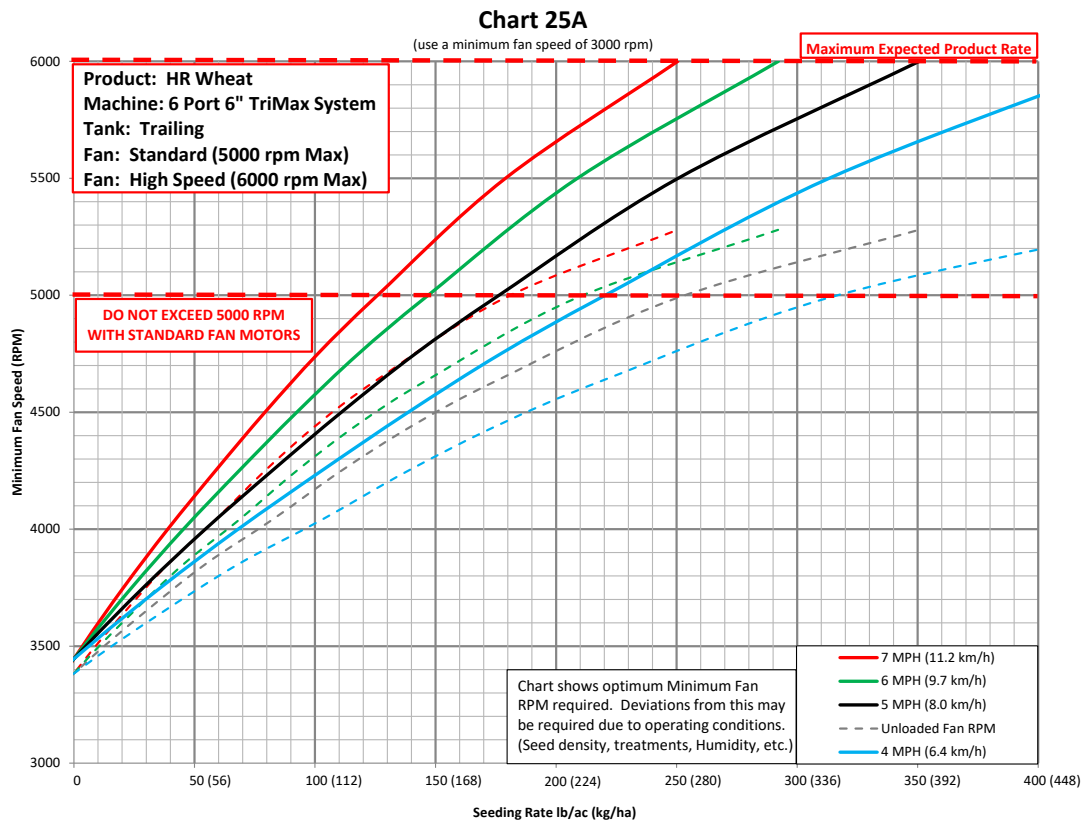
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.



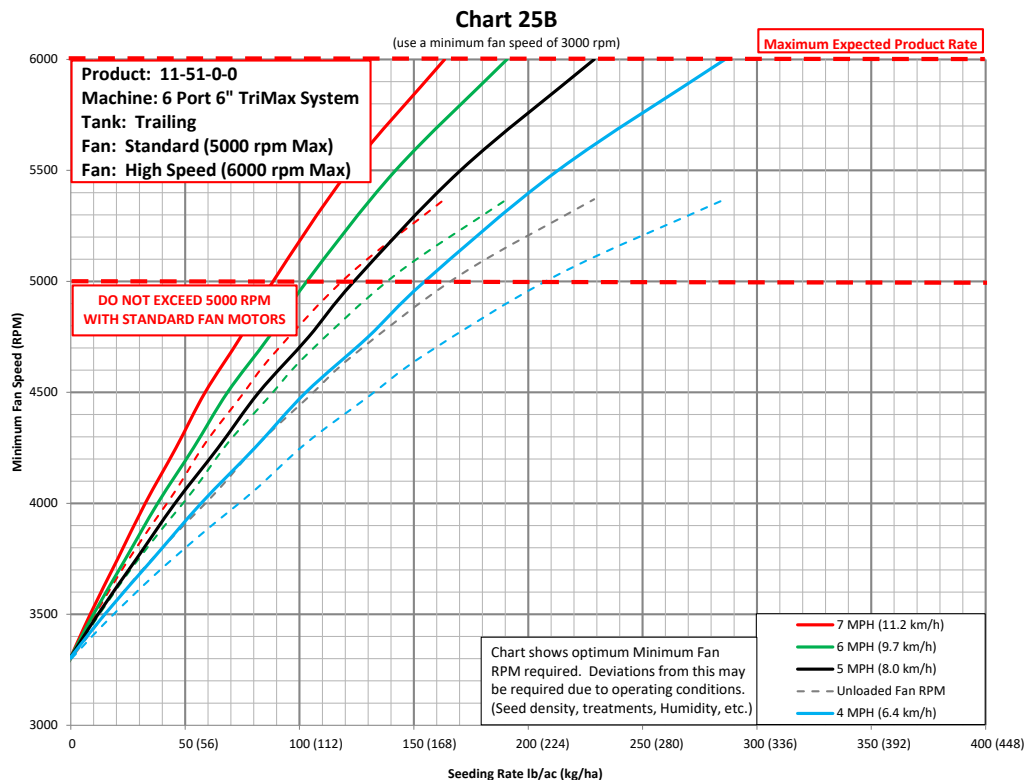


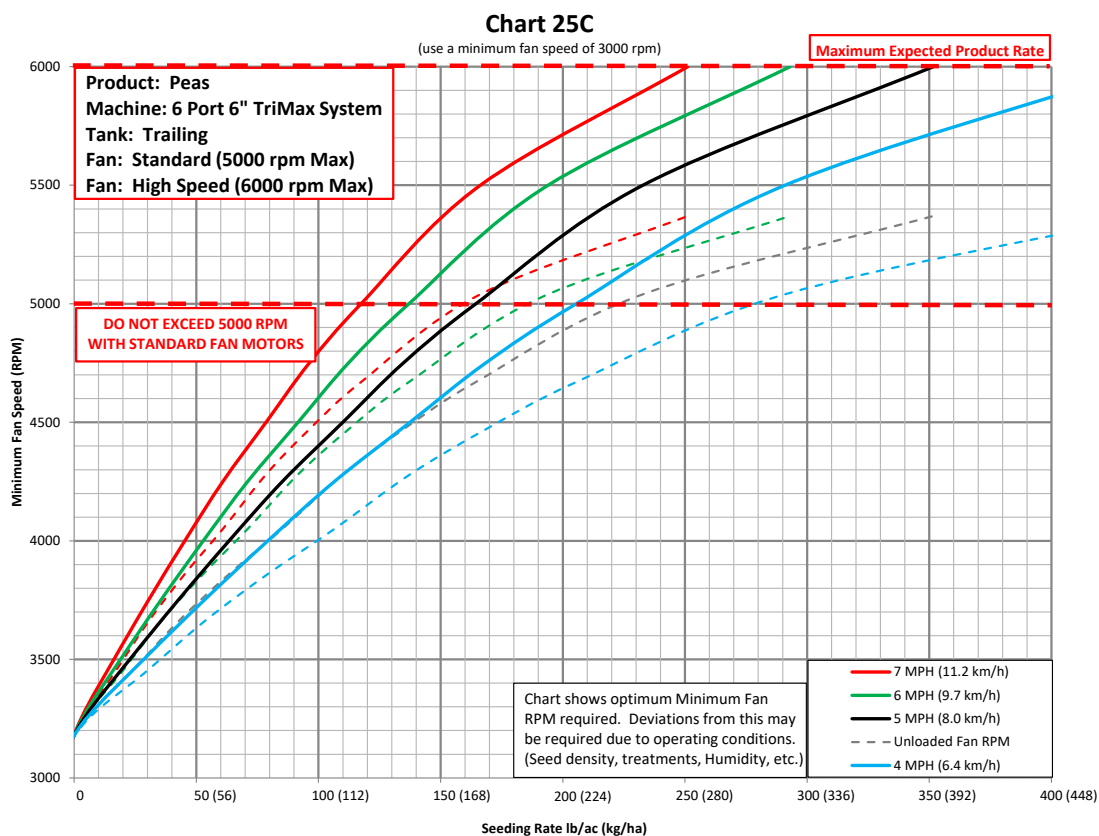
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.





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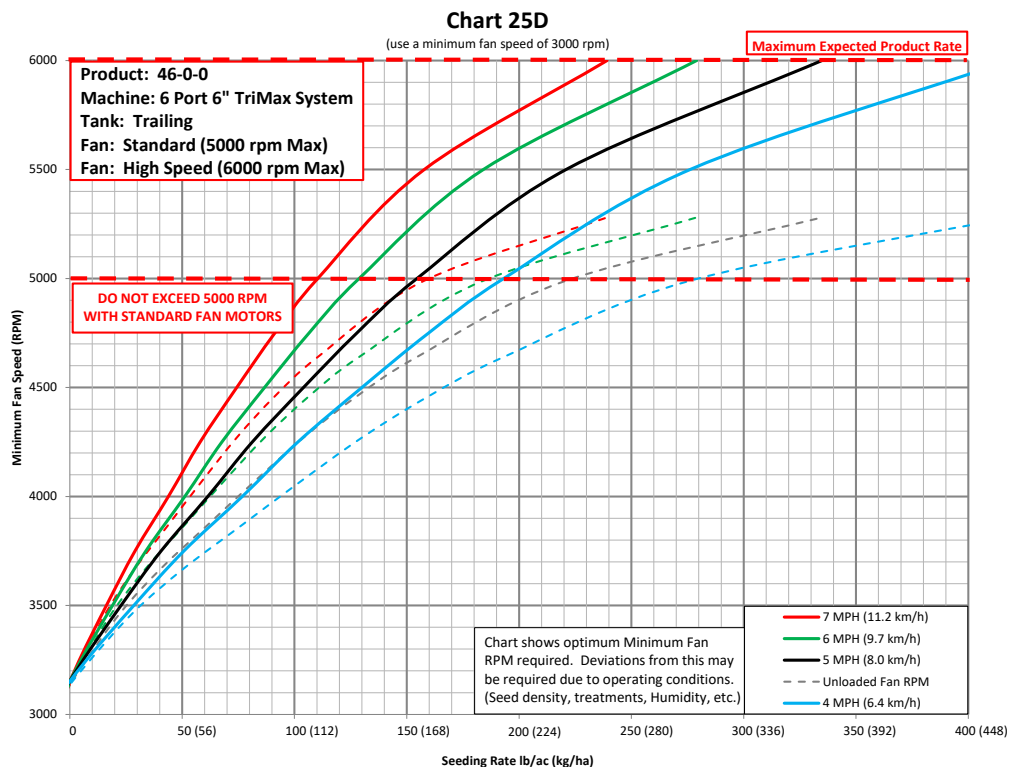
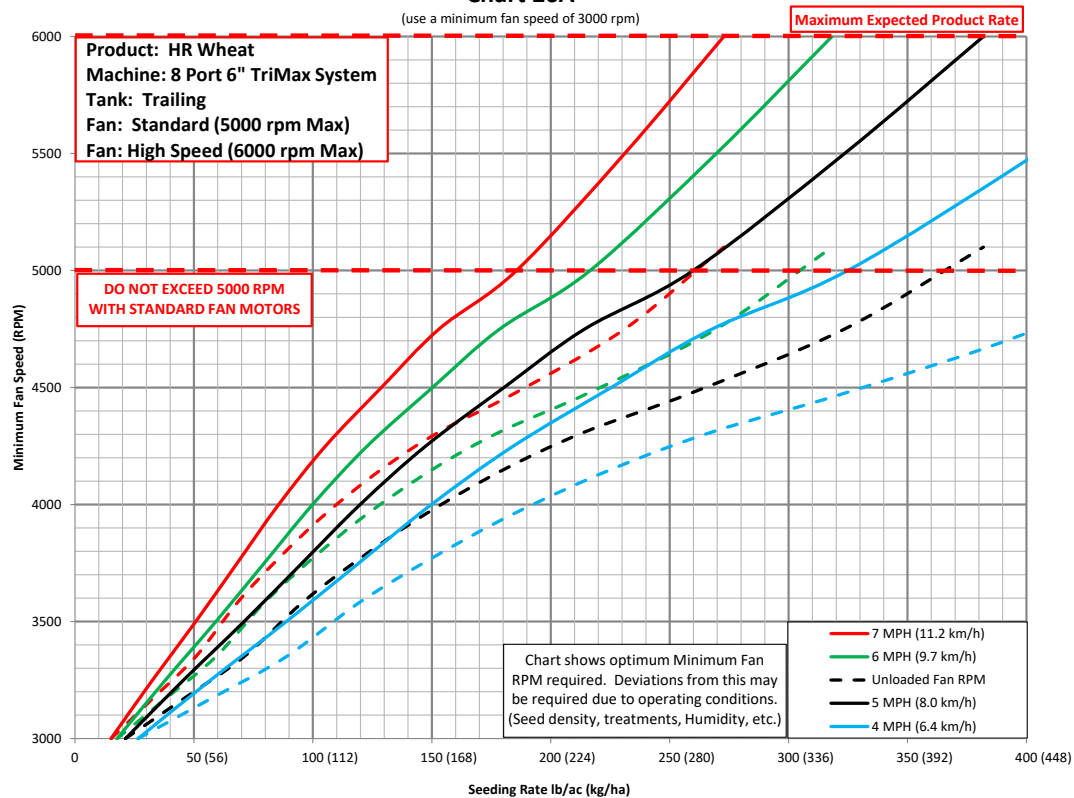


Chart 26A

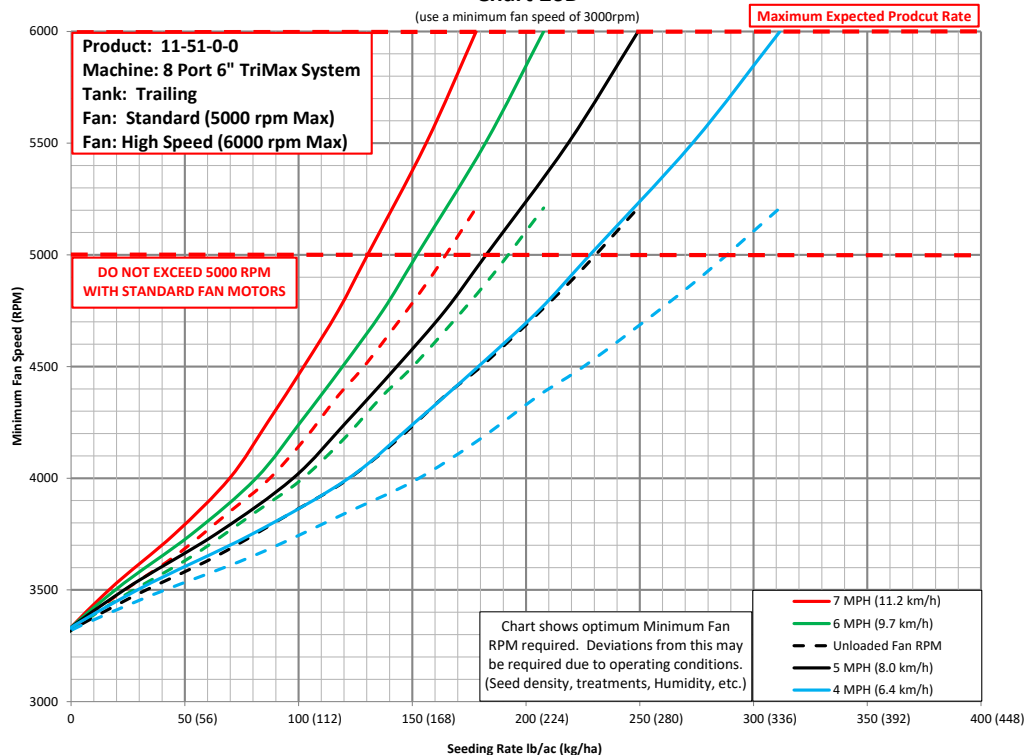
(use a minimum fan speed of 3000 rpm)

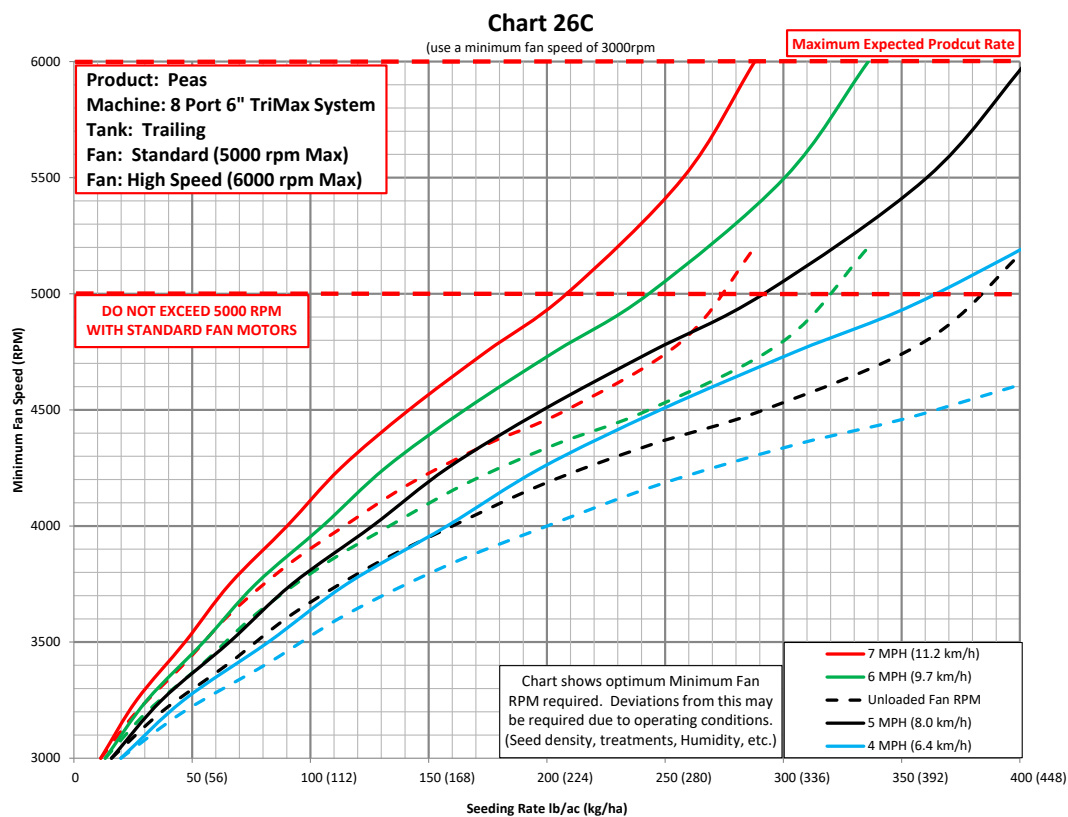


Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.

Chart 26B

(use a minimum fan speed of 3000rpm)





Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.

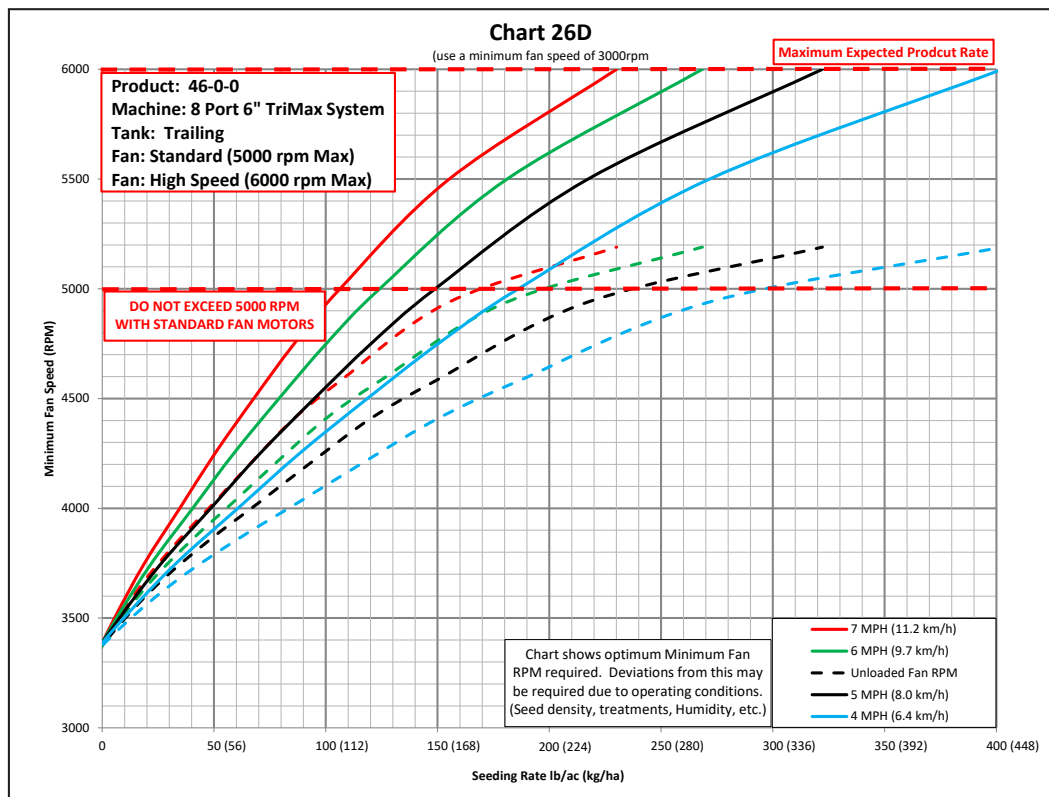
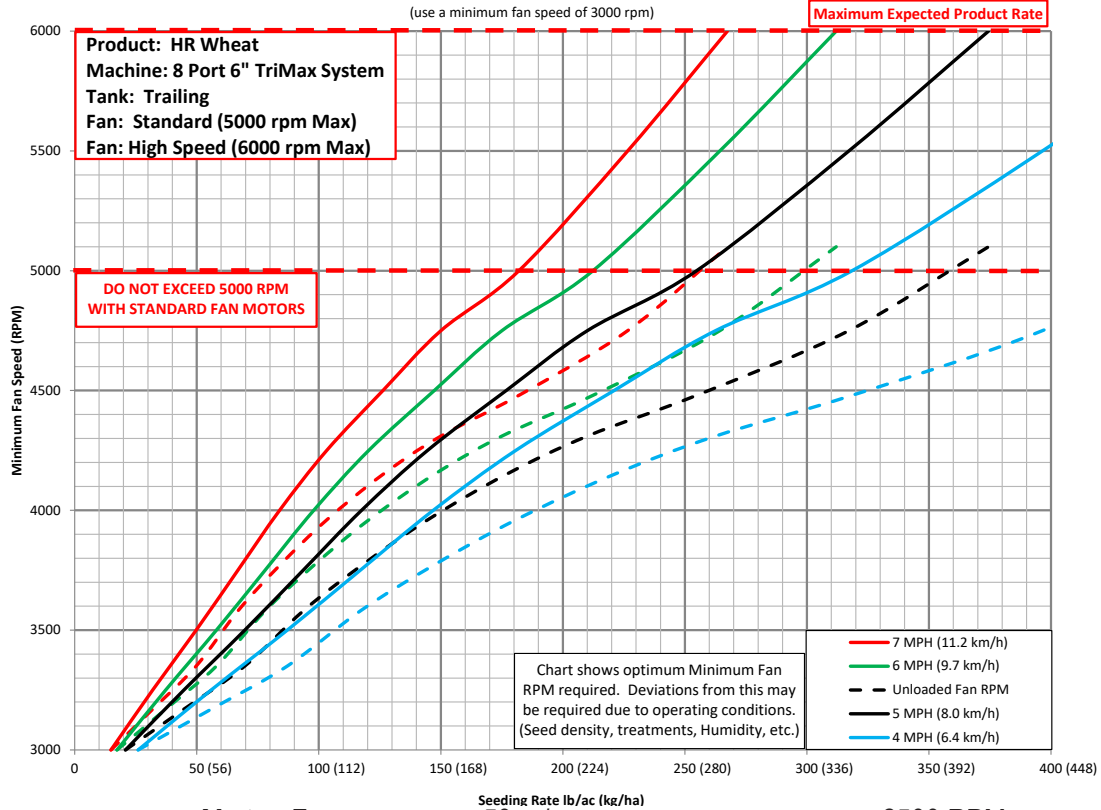


Chart 27A

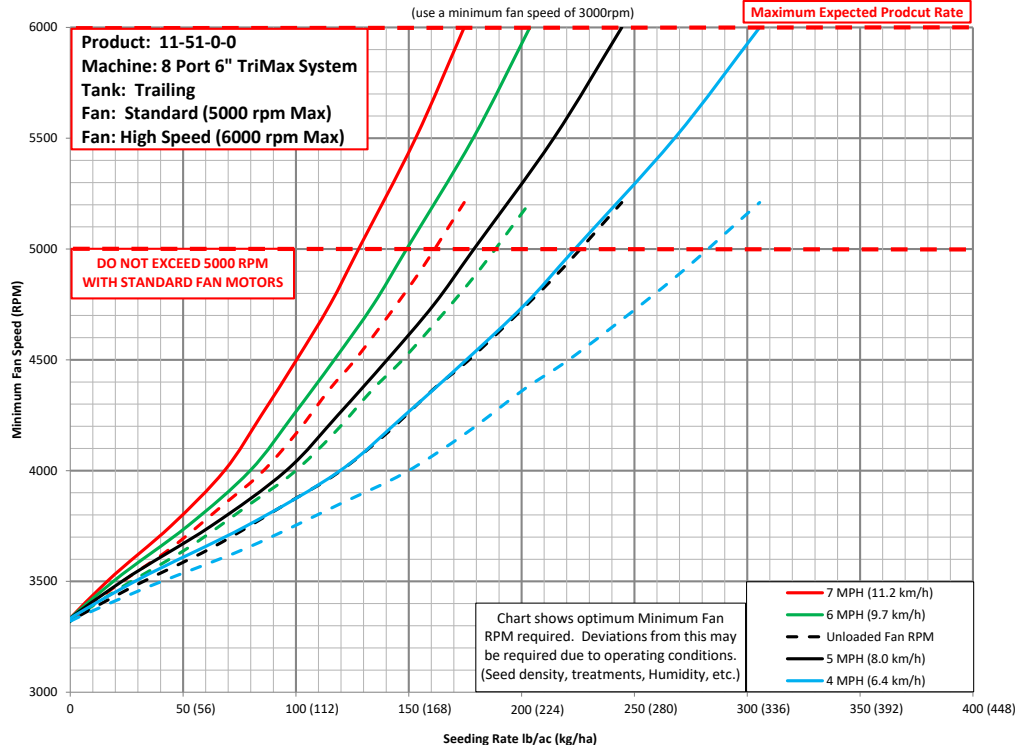
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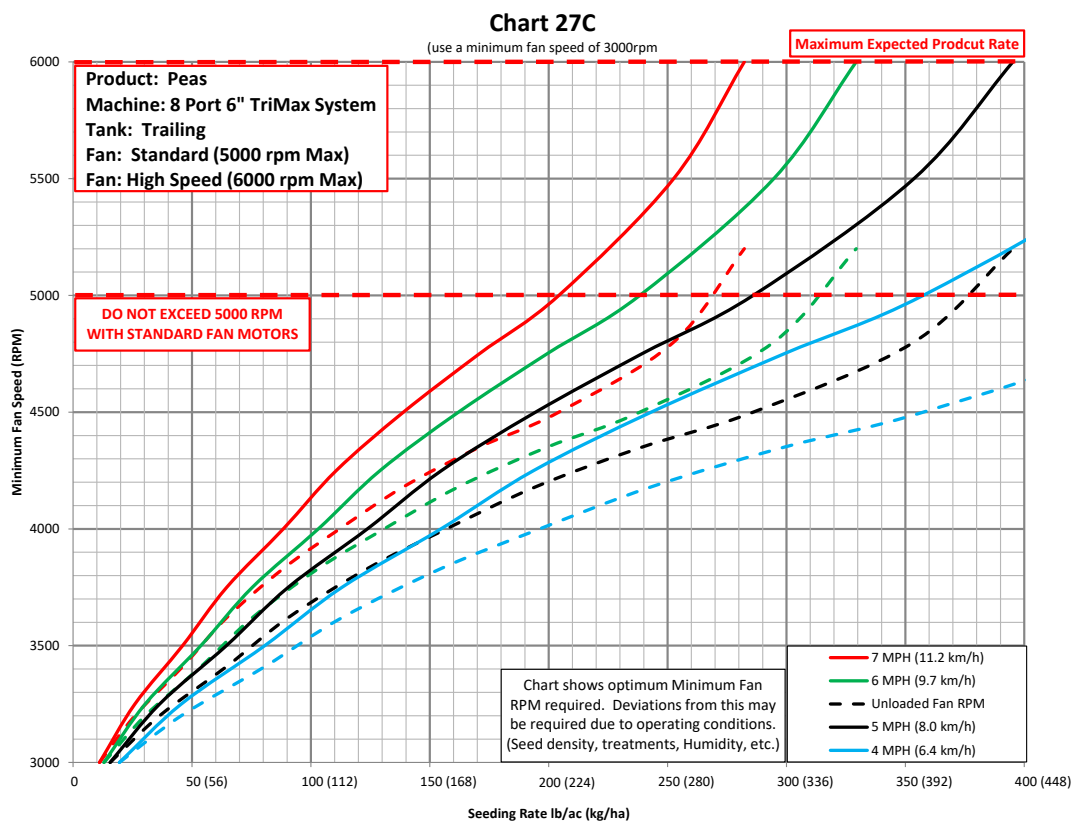


Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.

Chart 27B

(use a minimum fan speed of 3000rpm)





Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.

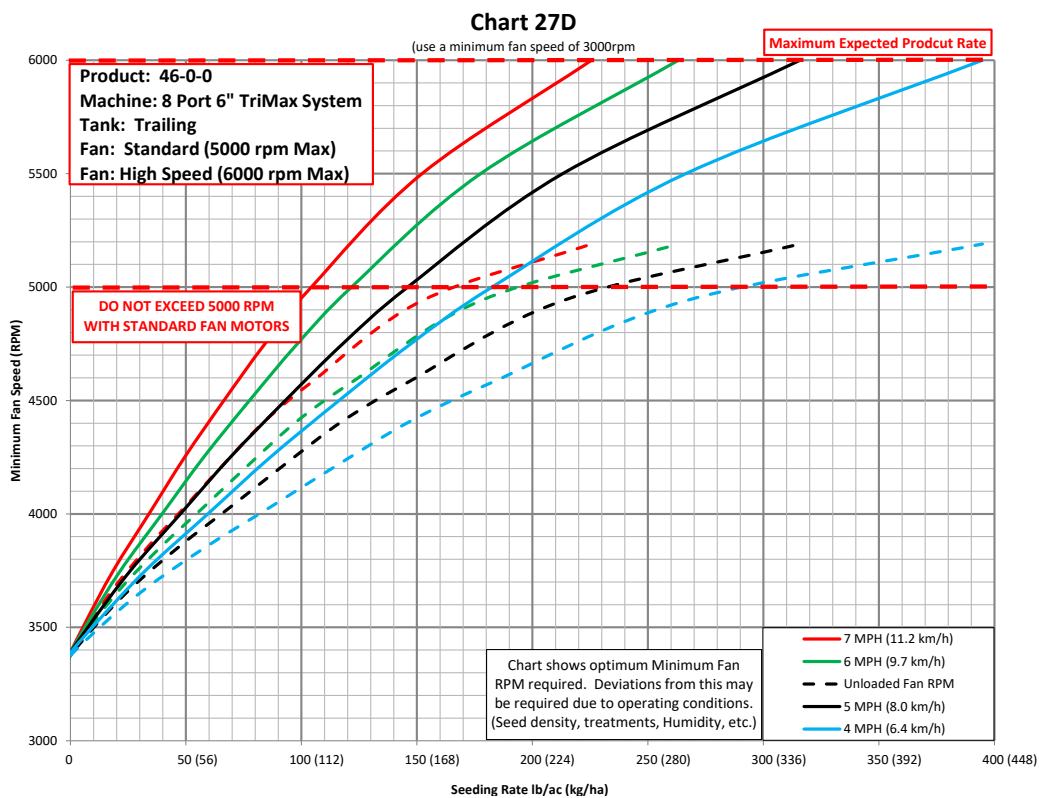
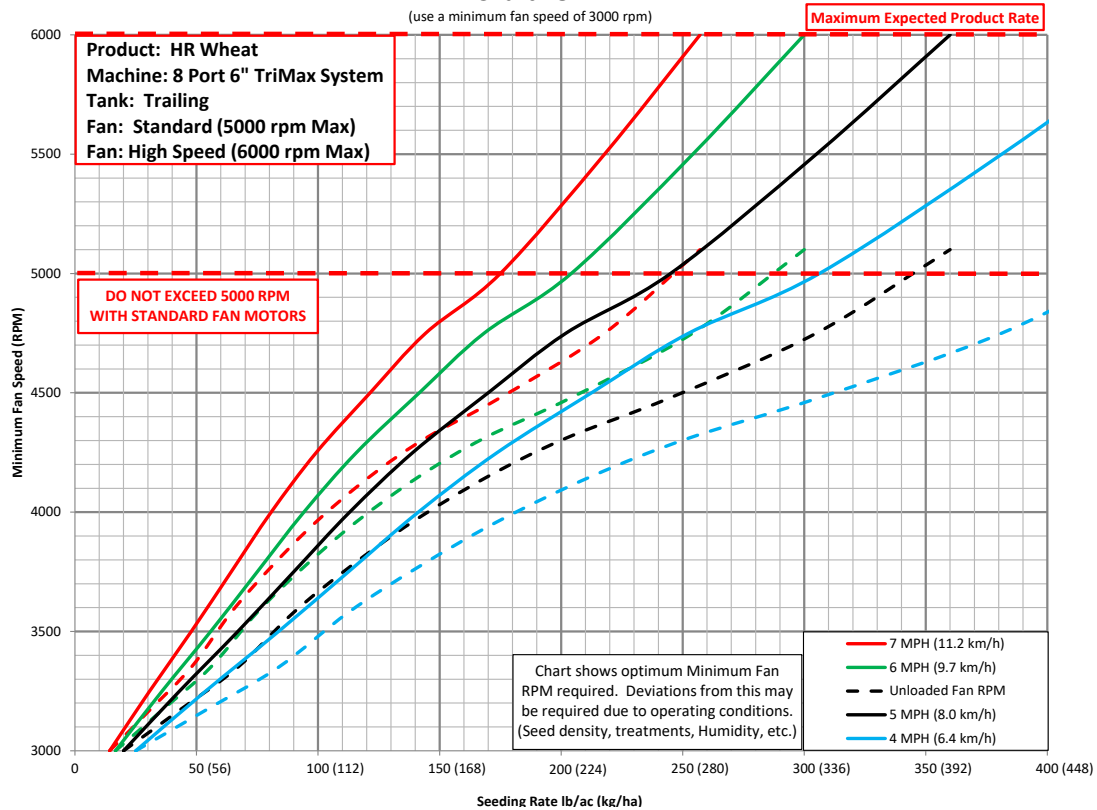


Chart 28A

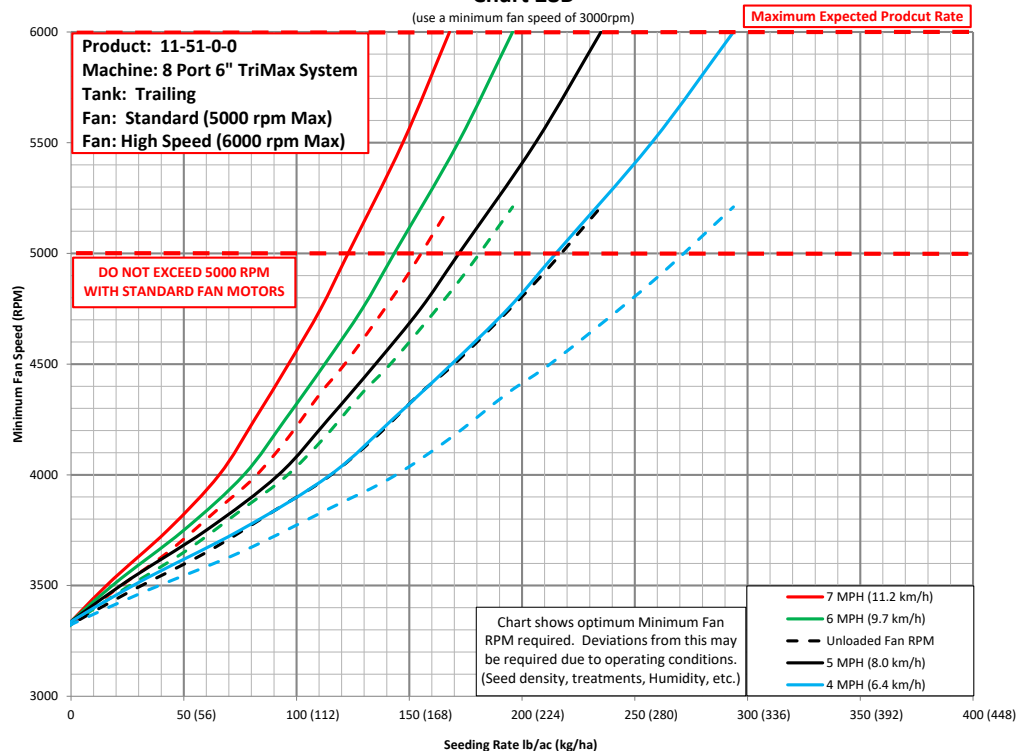
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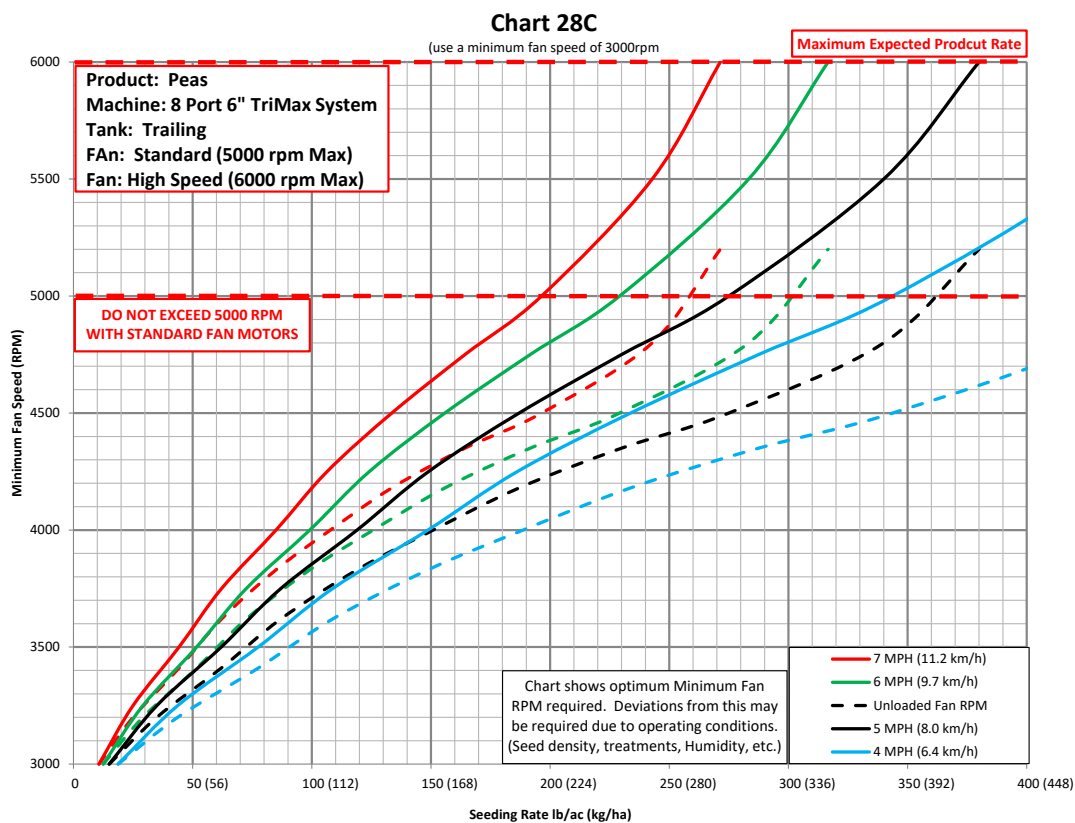


Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.

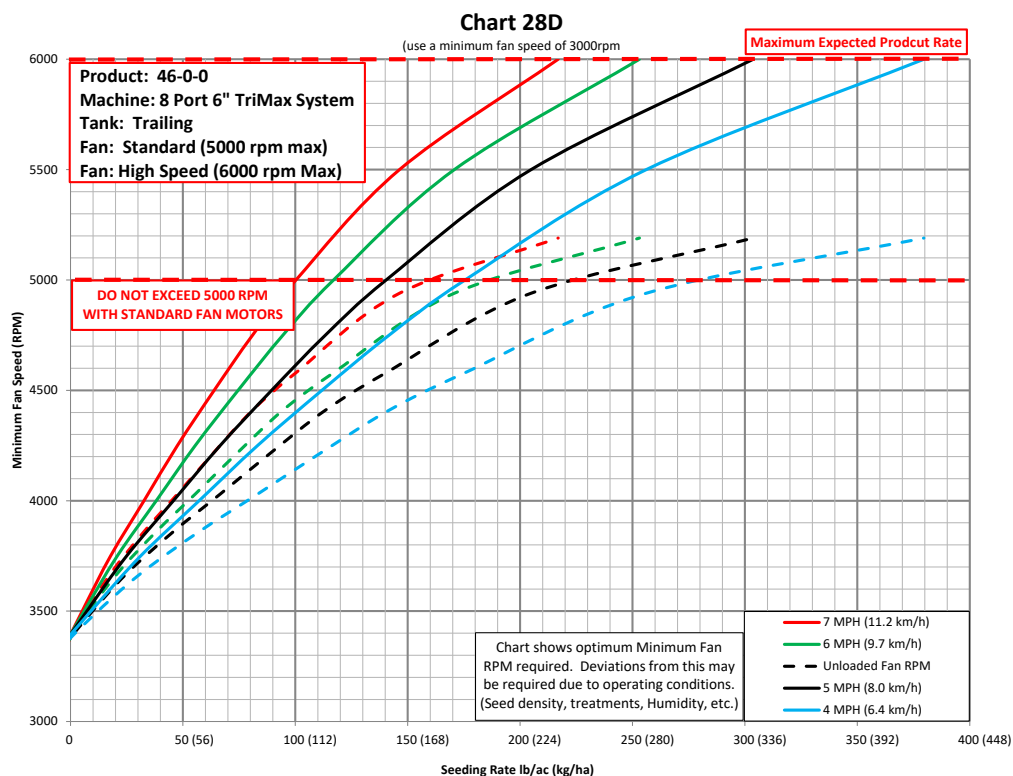
Chart 28B

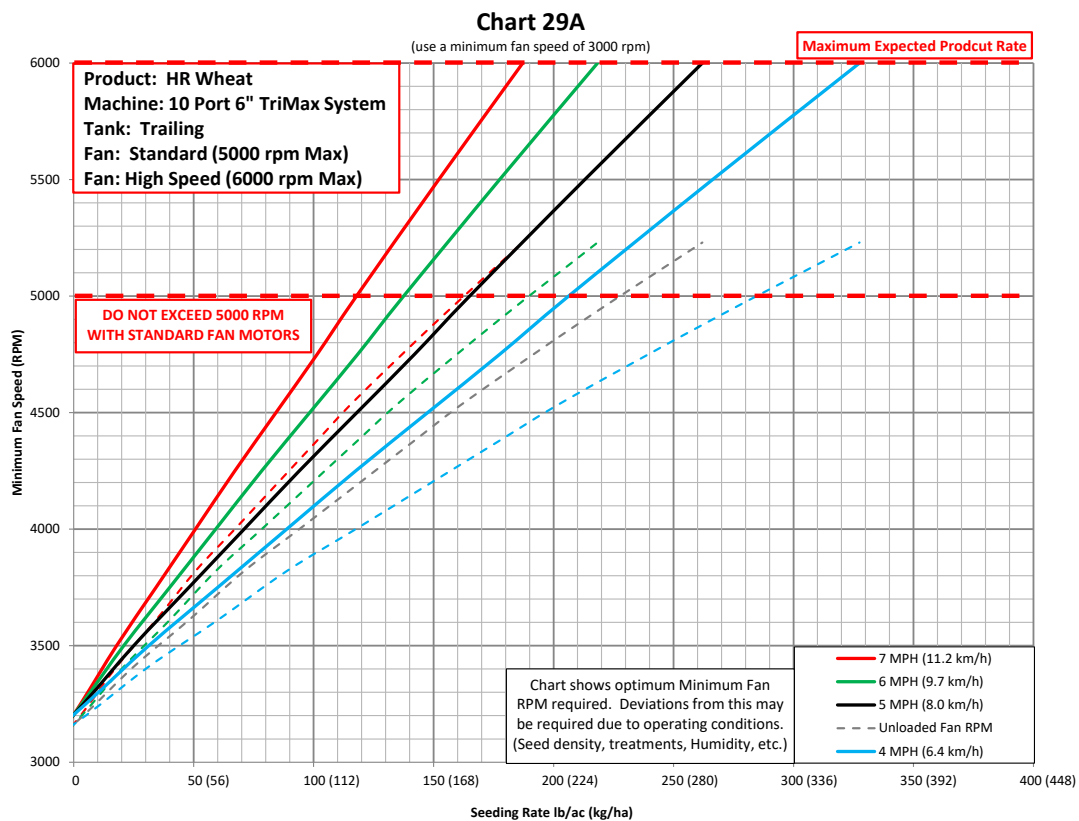
(use a minimum fan speed of 3000rpm)



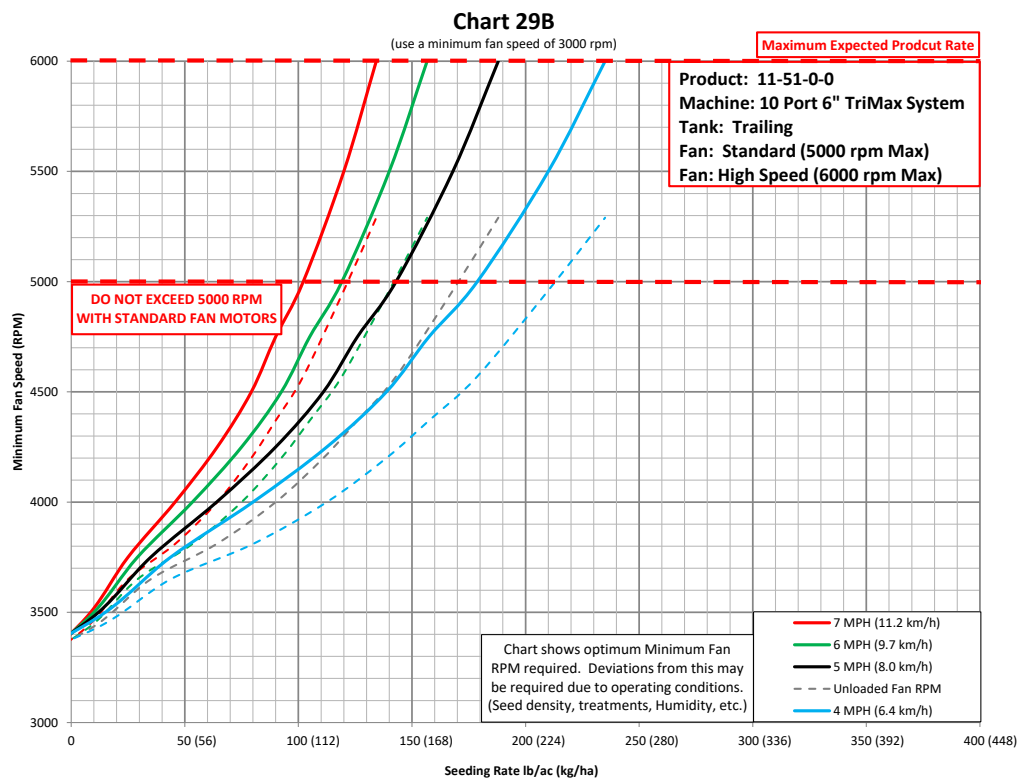


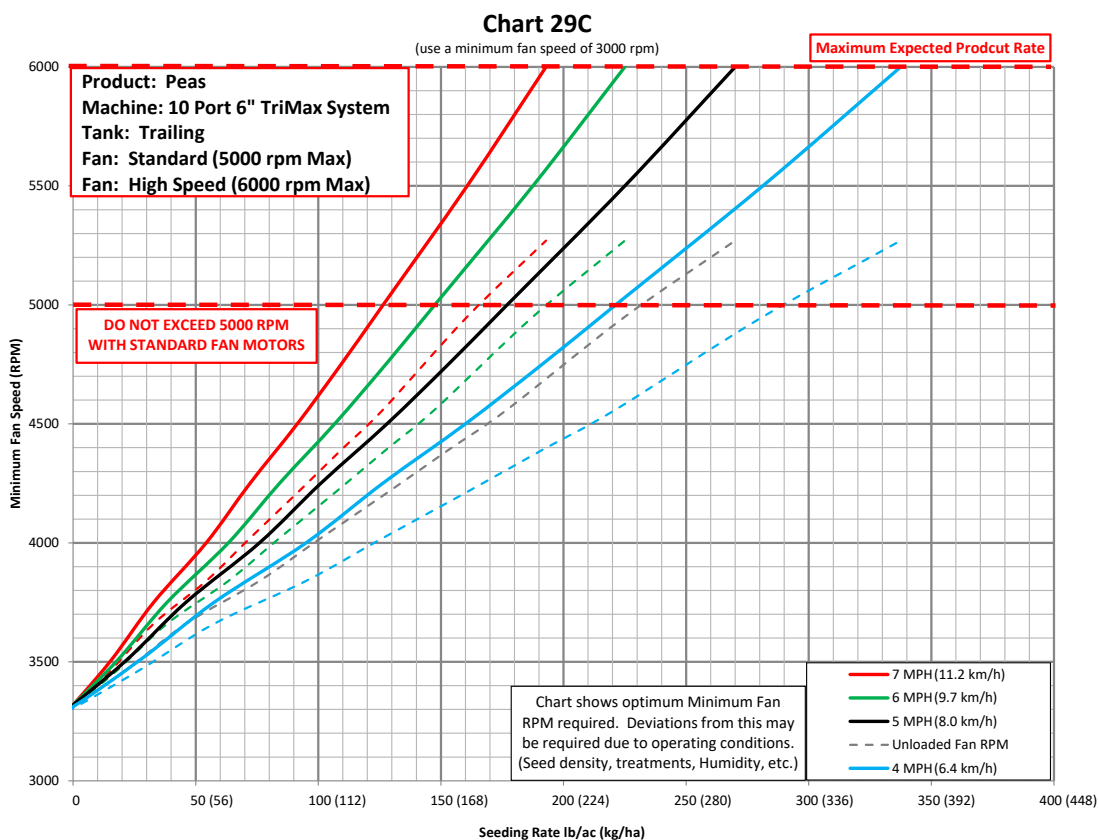
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.



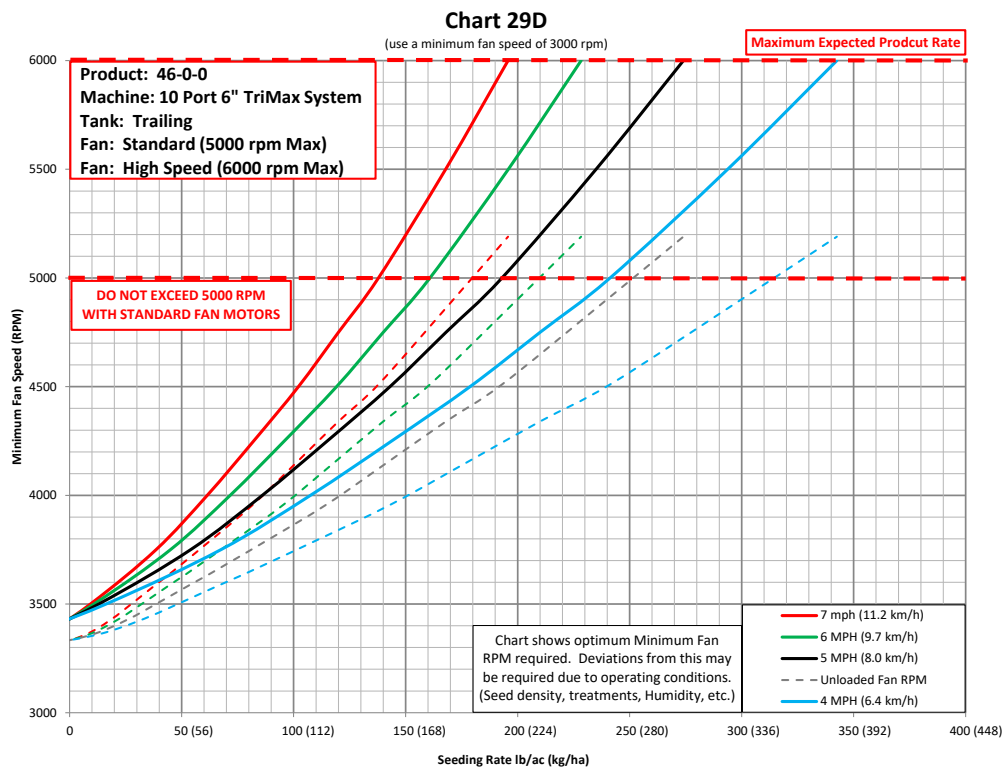


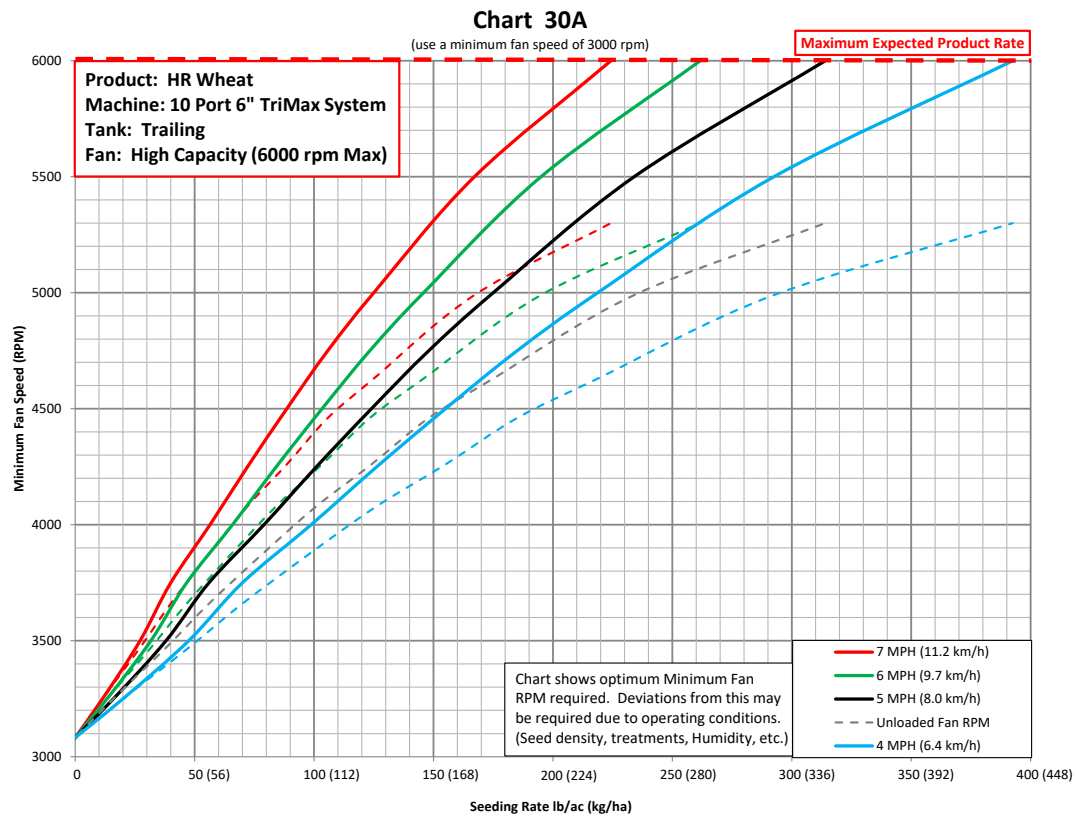
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.



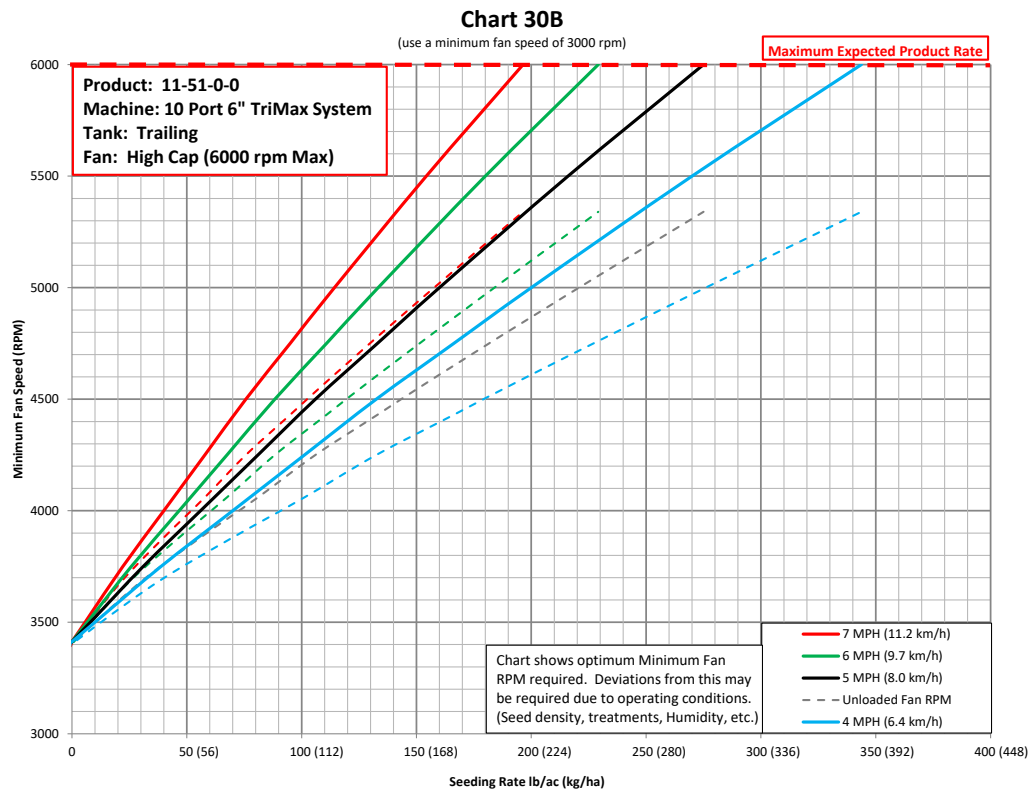


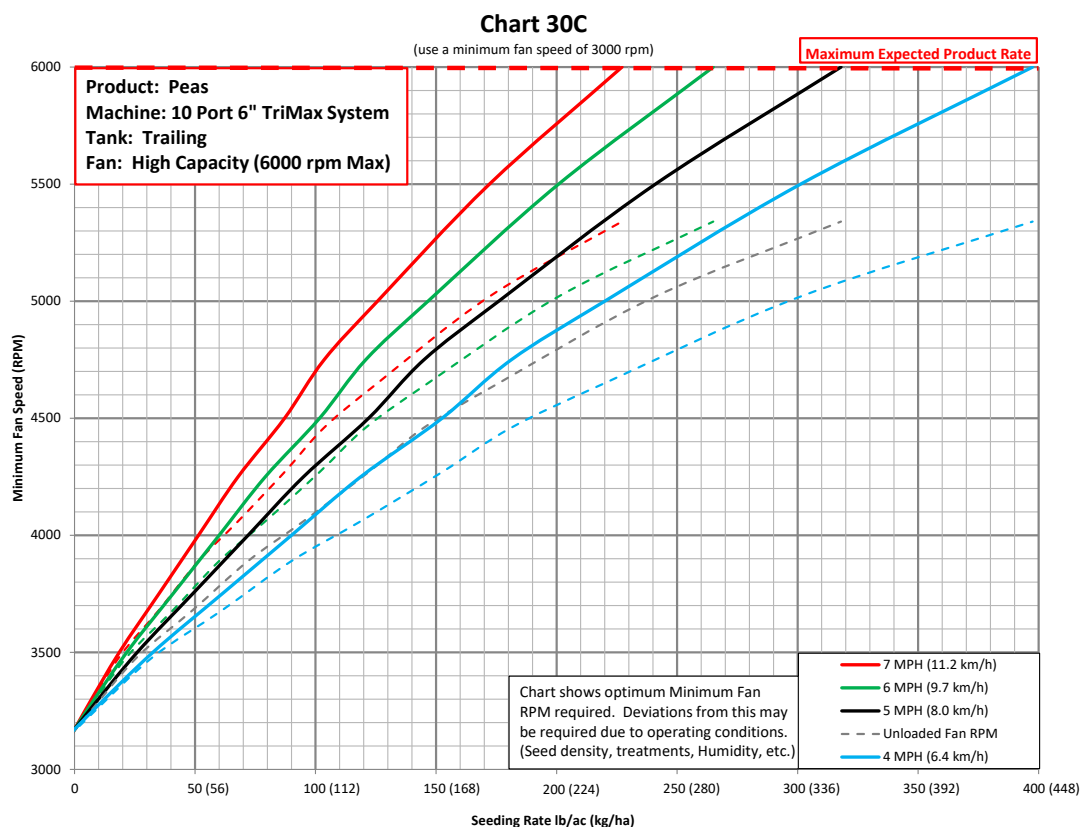
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.



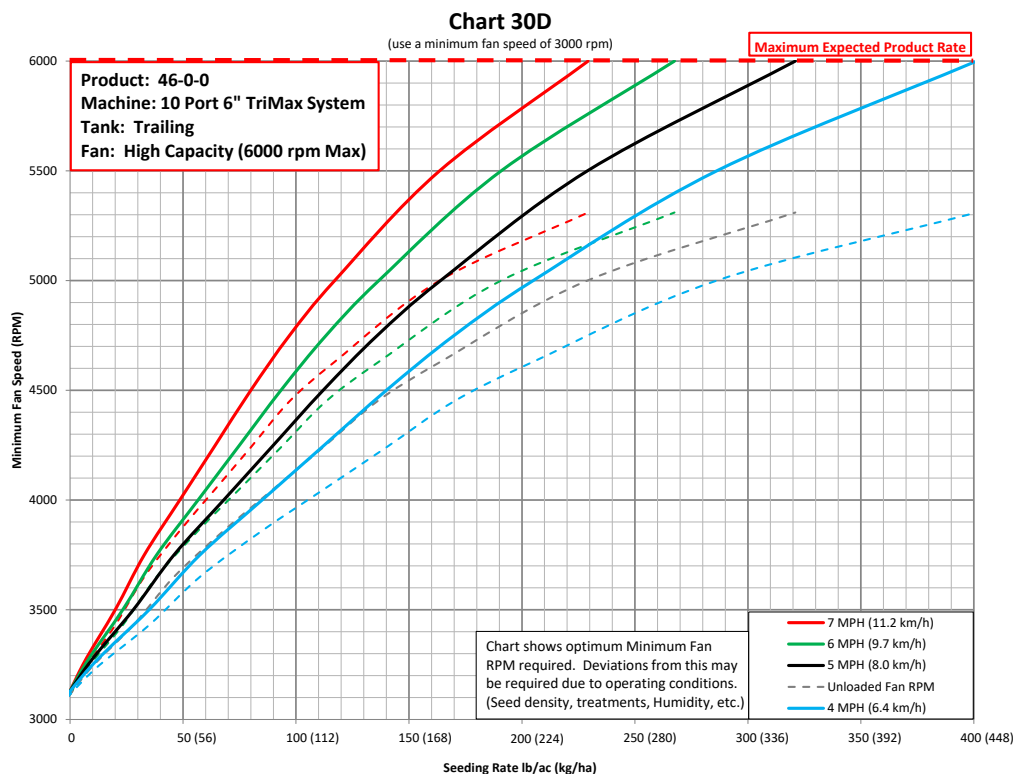


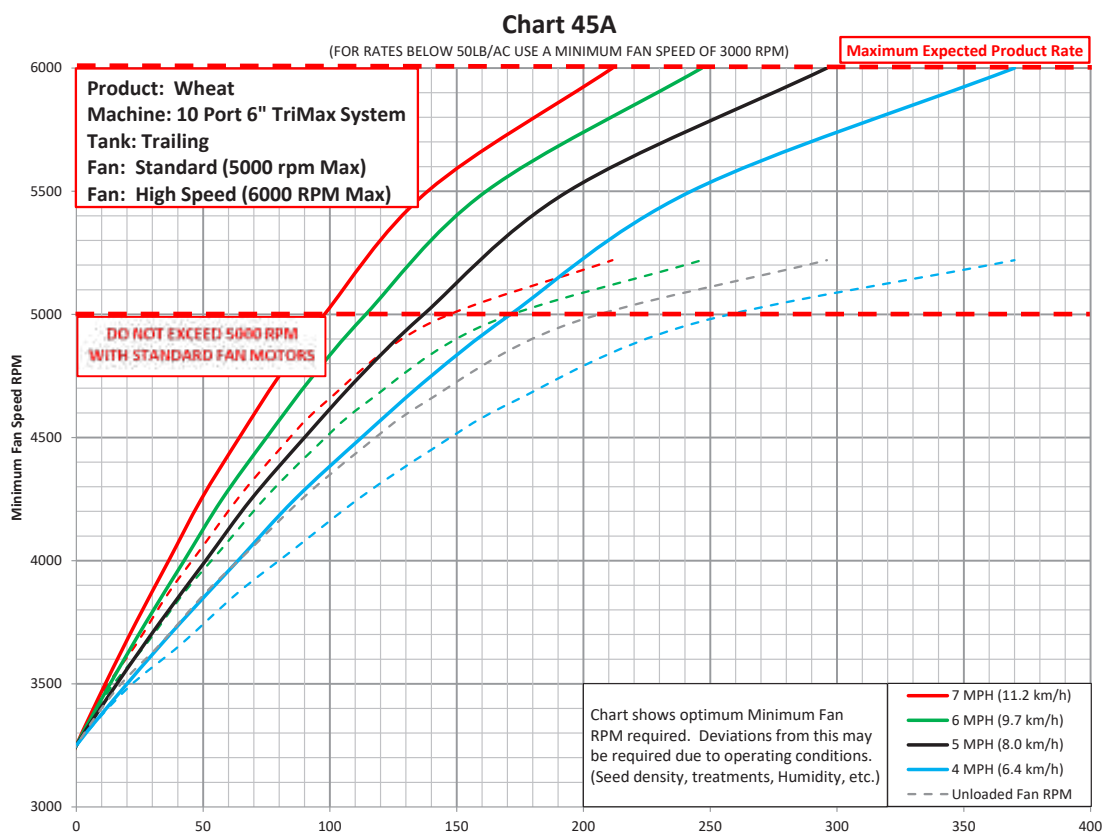
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.



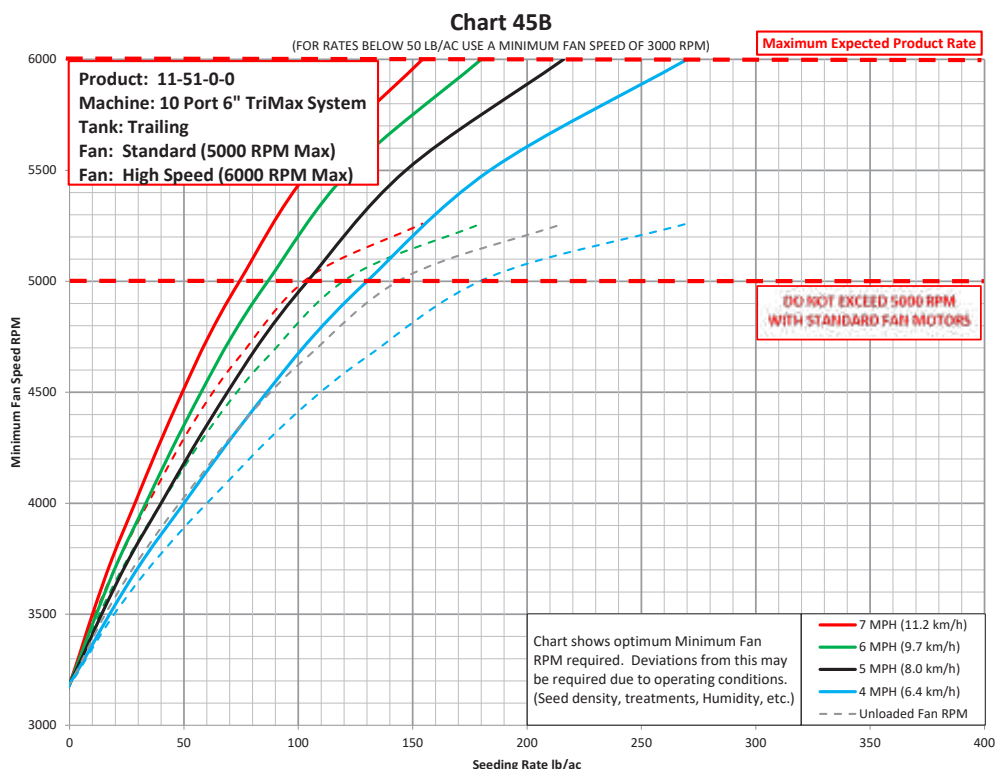


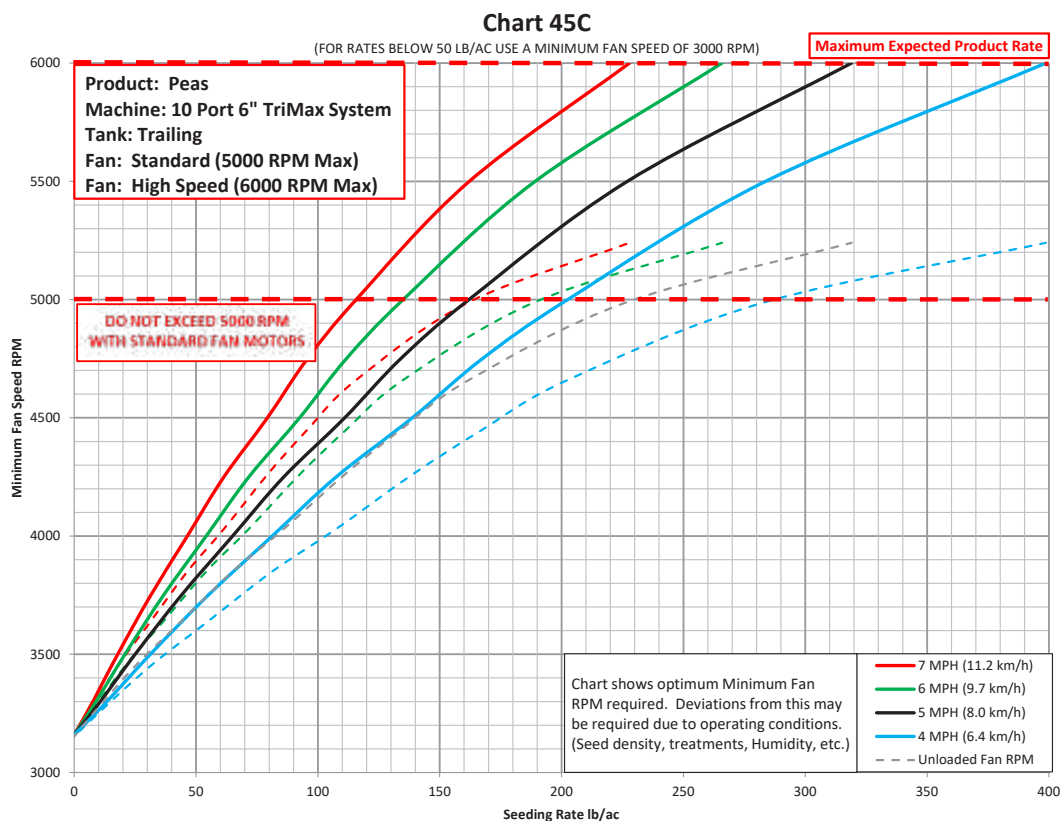
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.



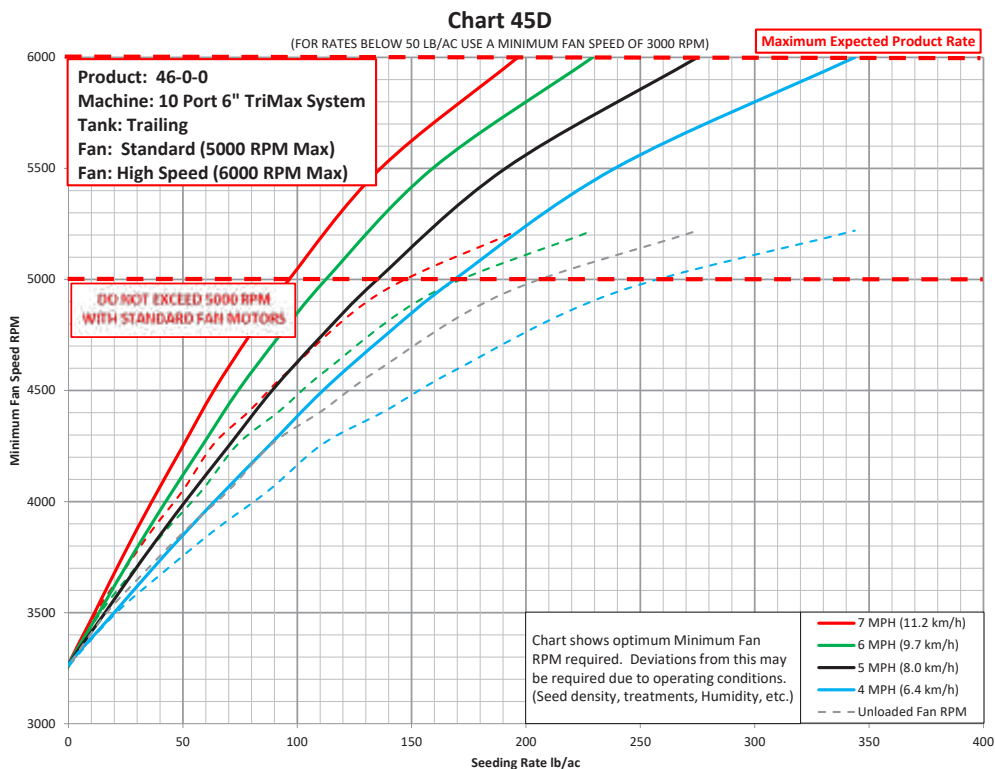


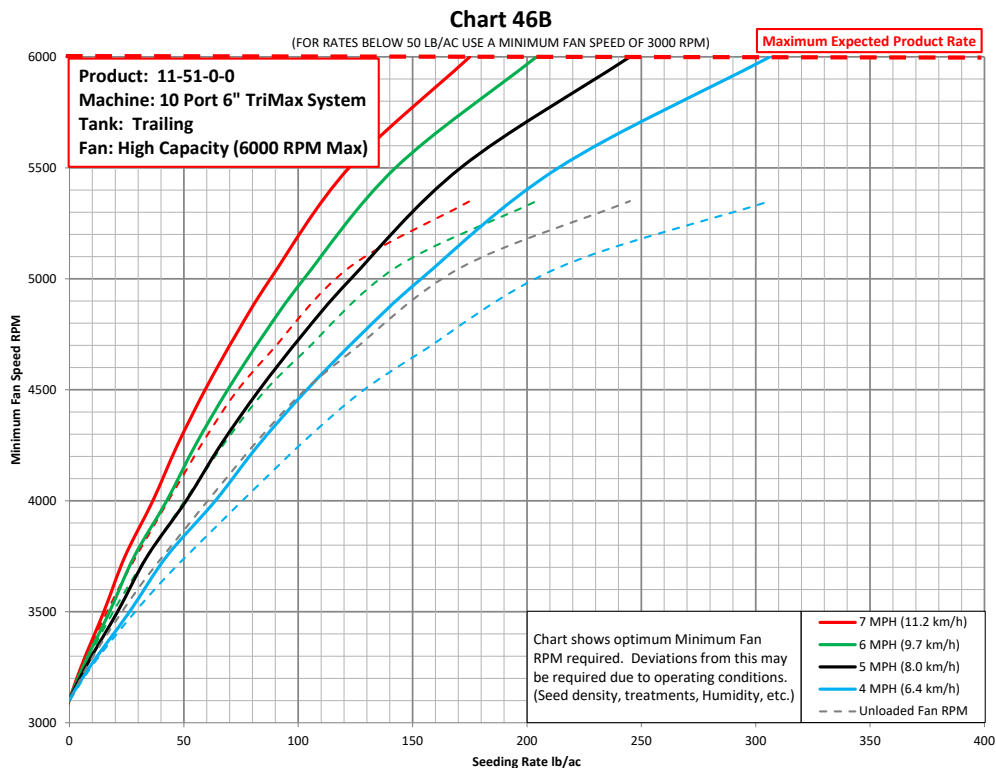
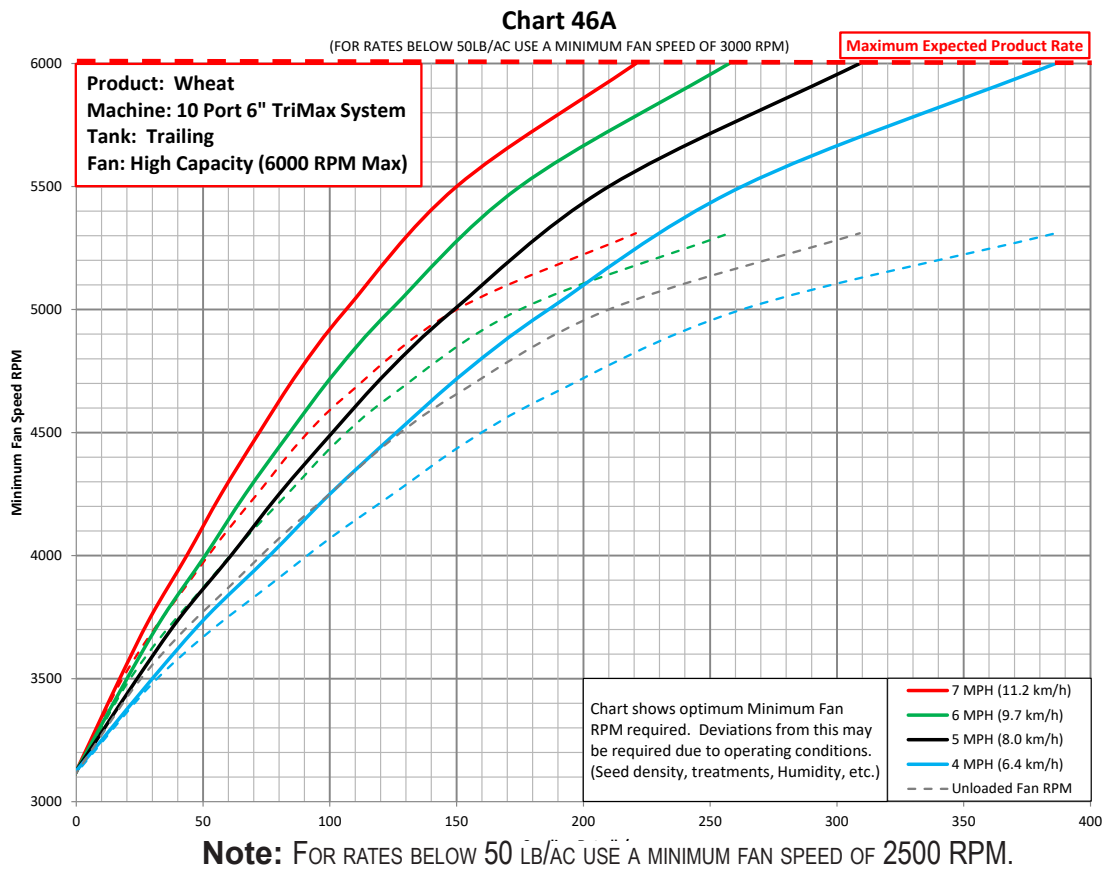
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.

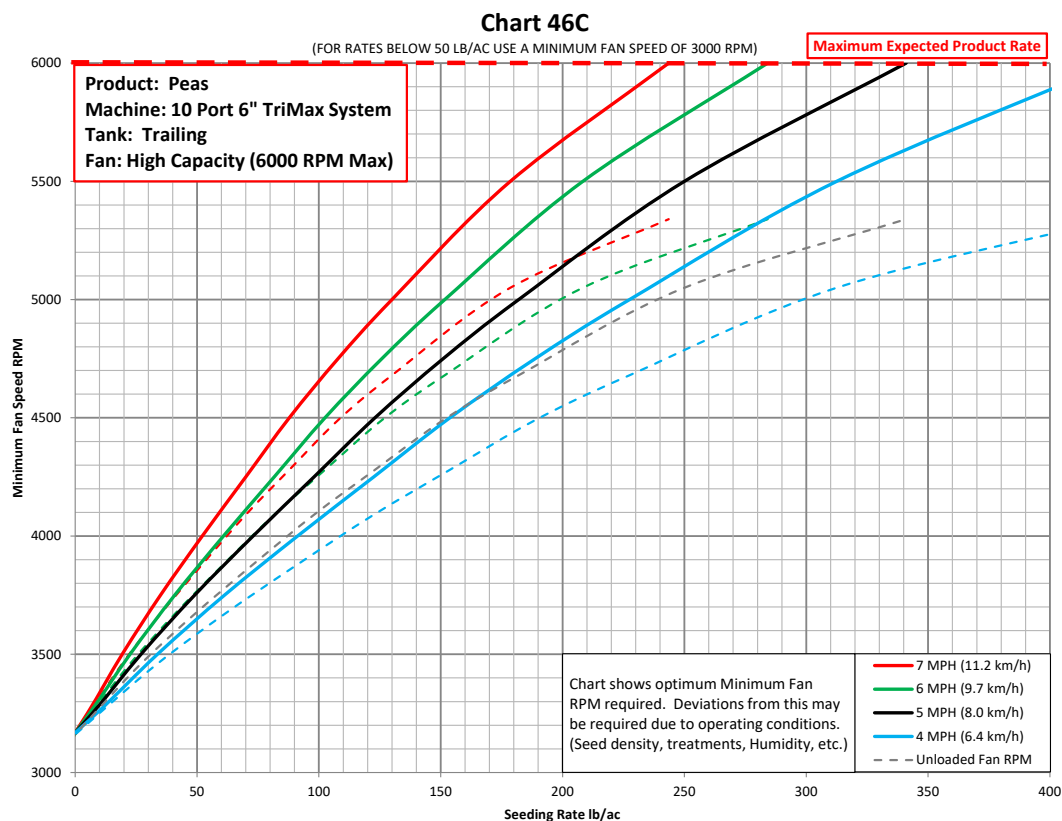




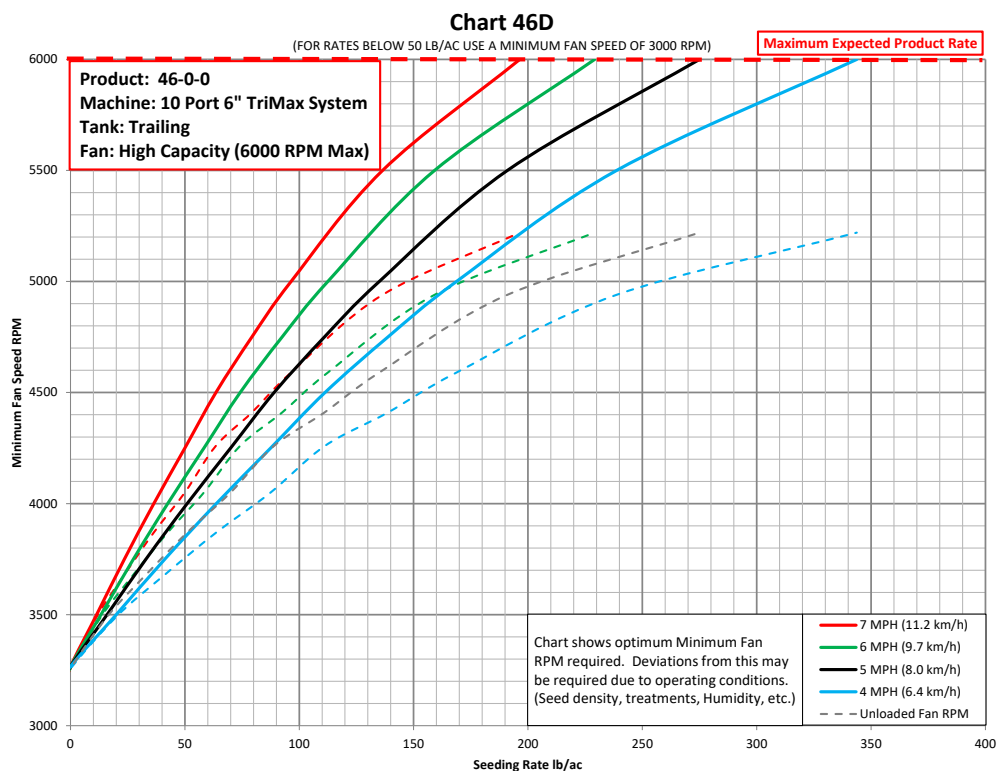
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.



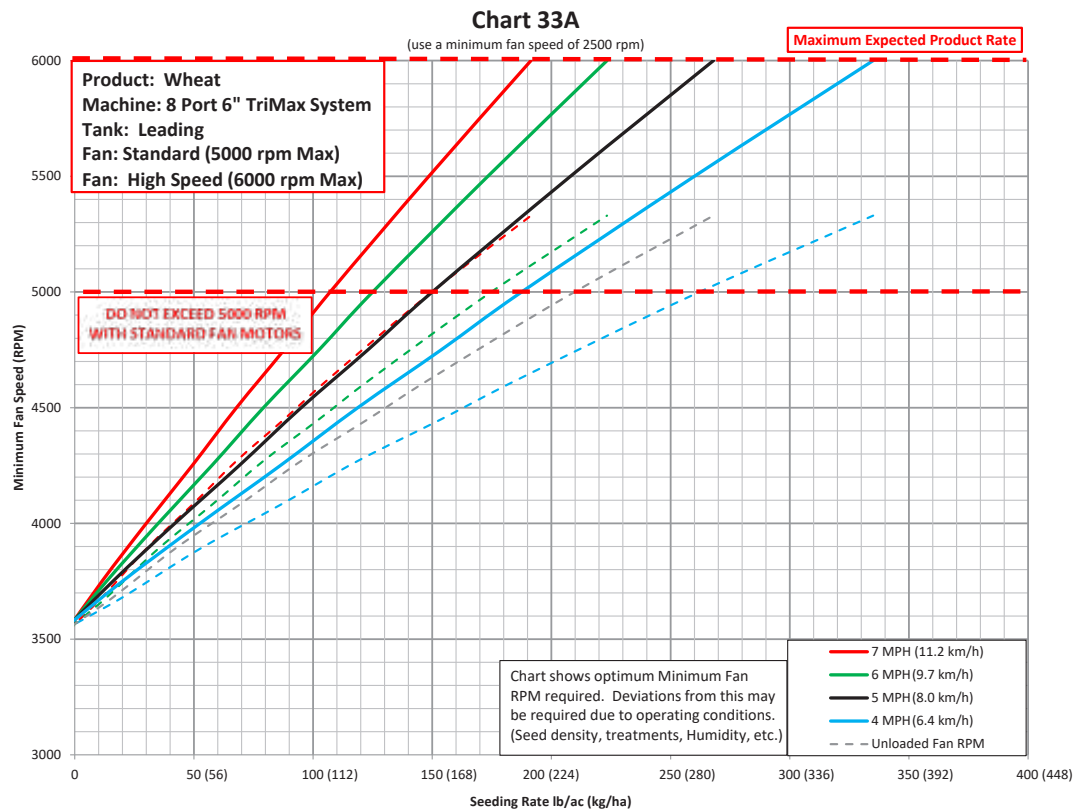




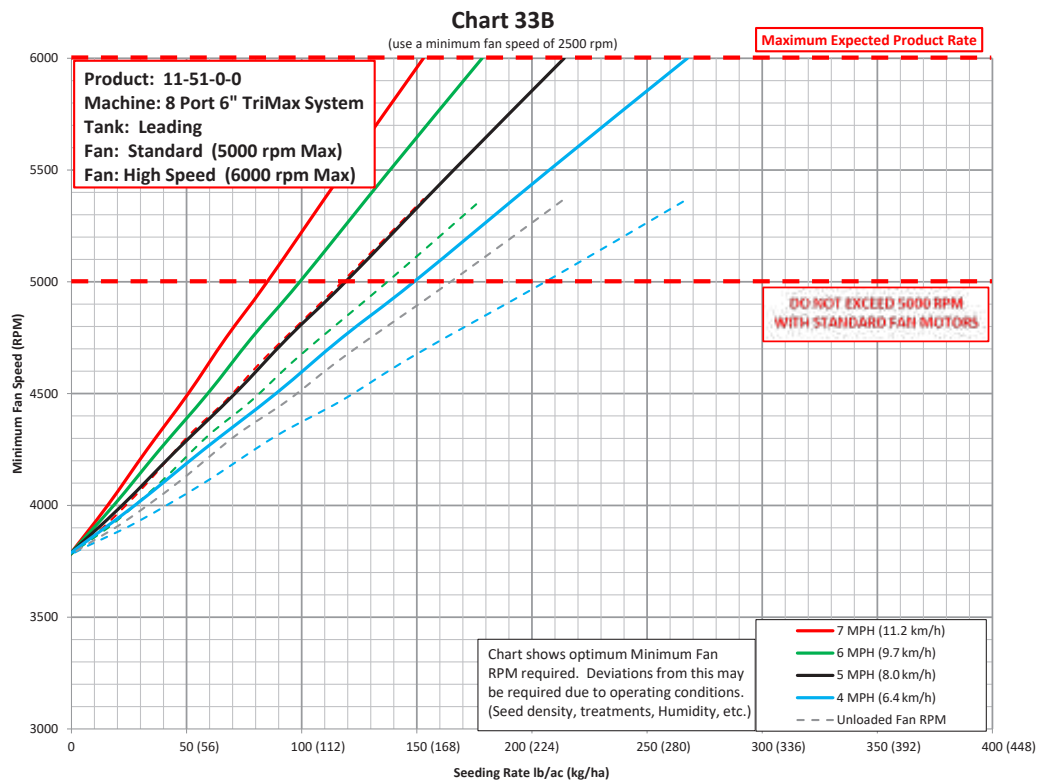
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.

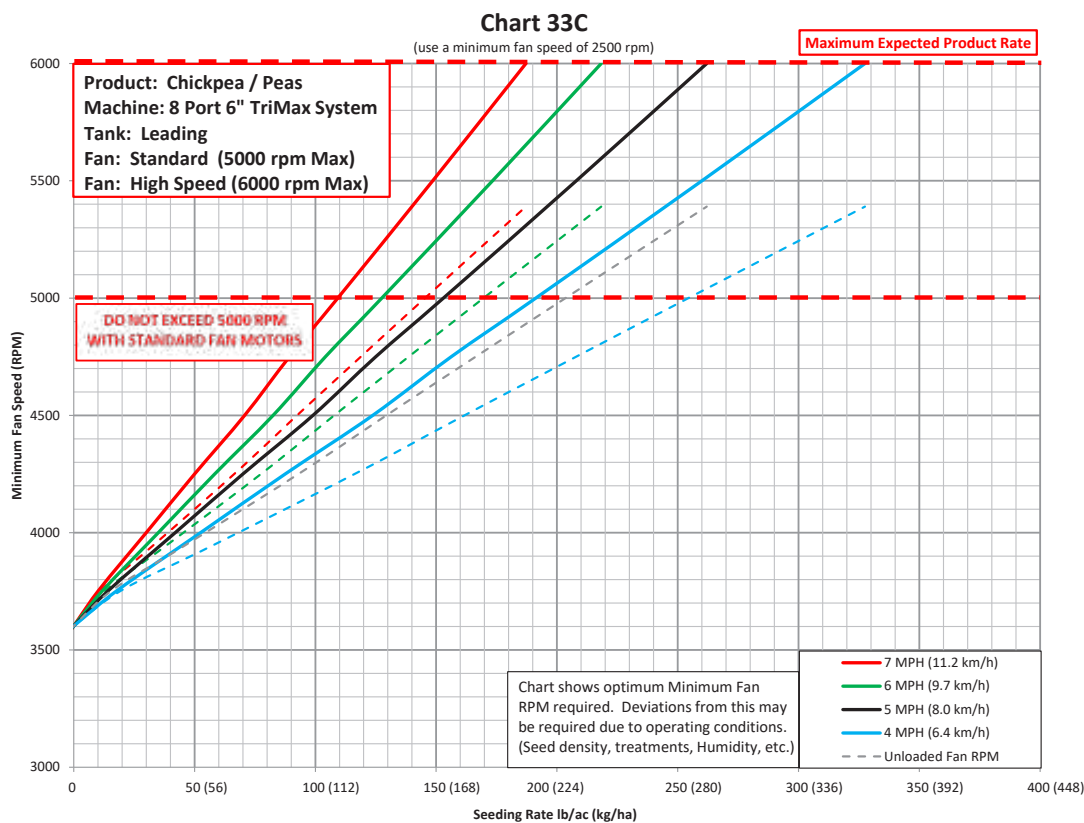


3 Leading Air Cart Charts

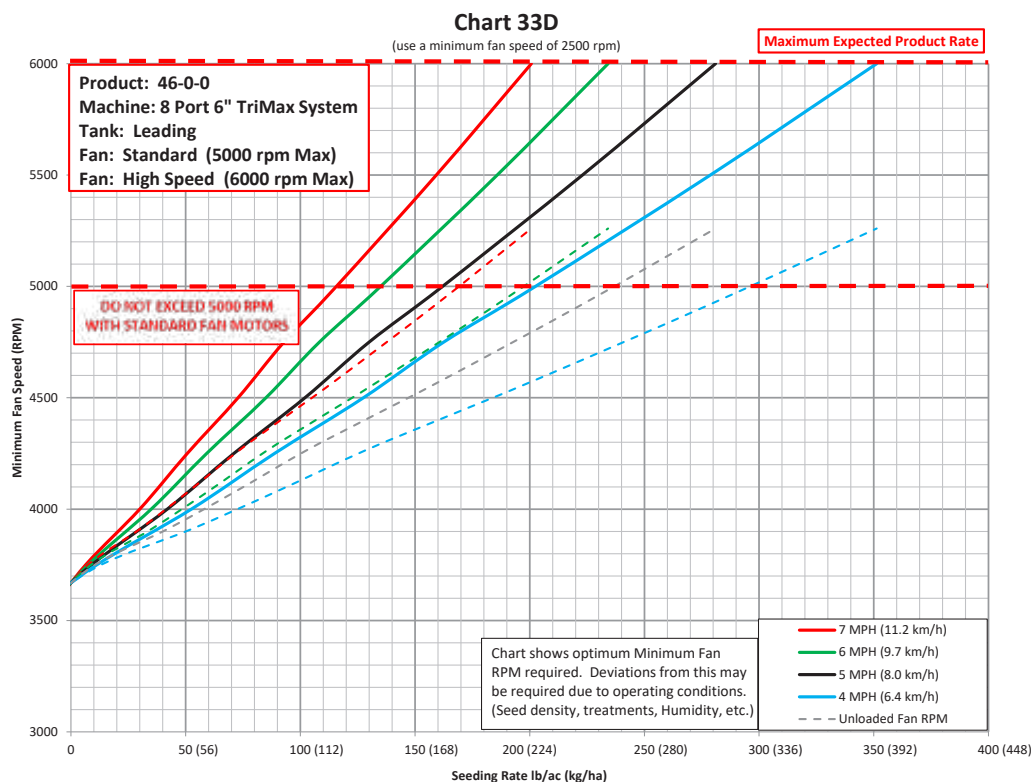


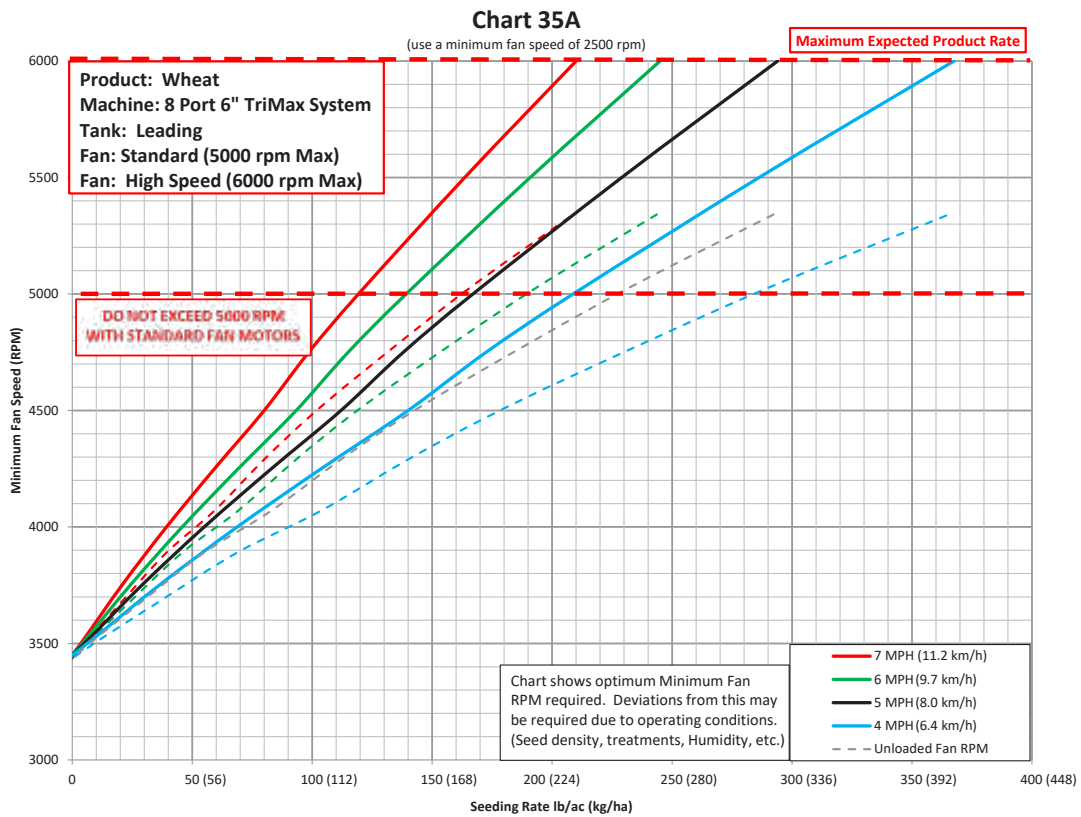
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.



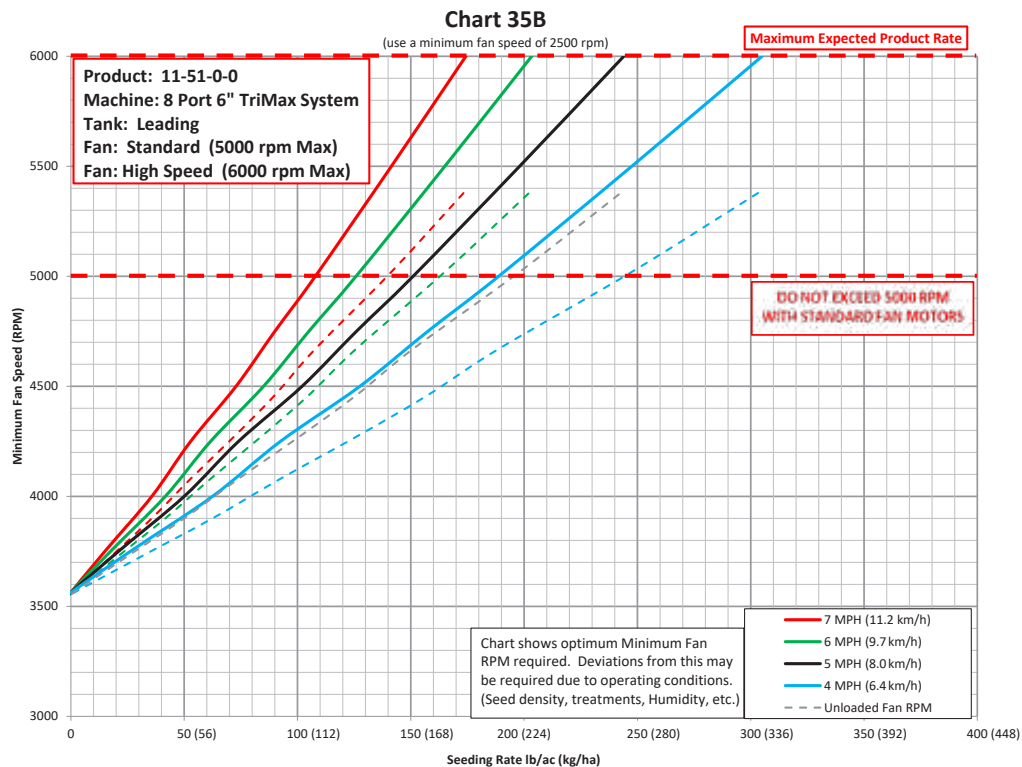


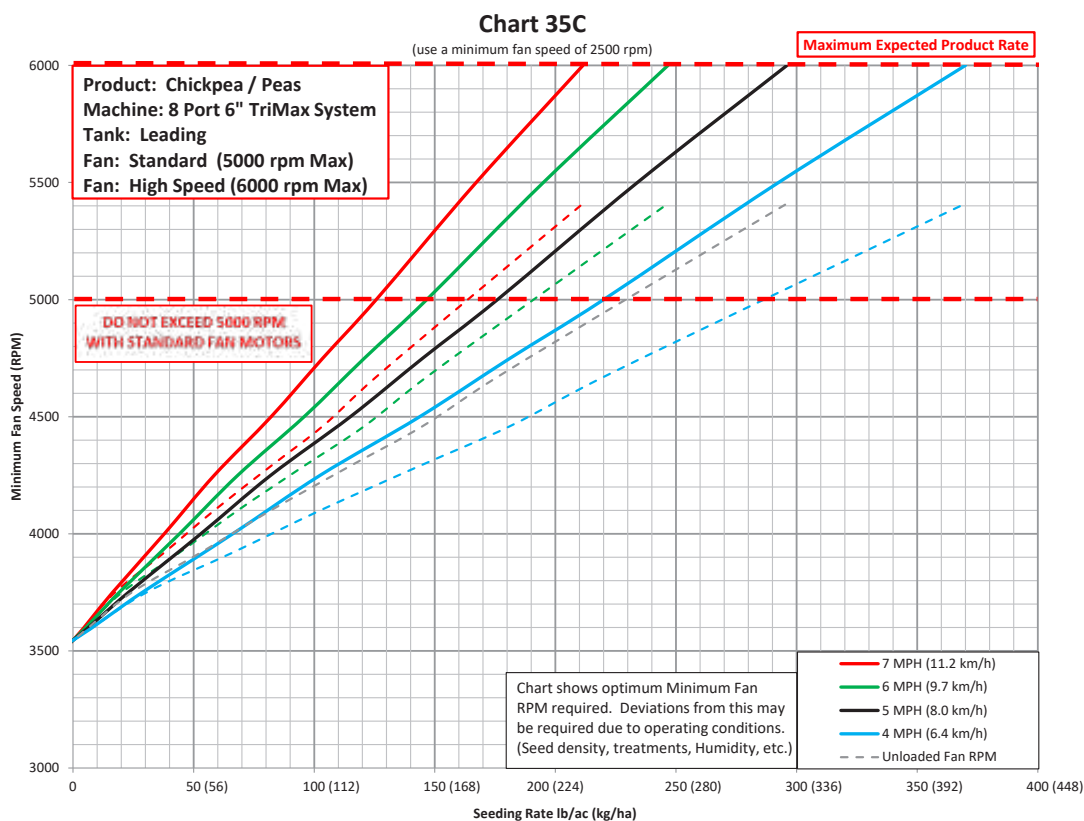
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.



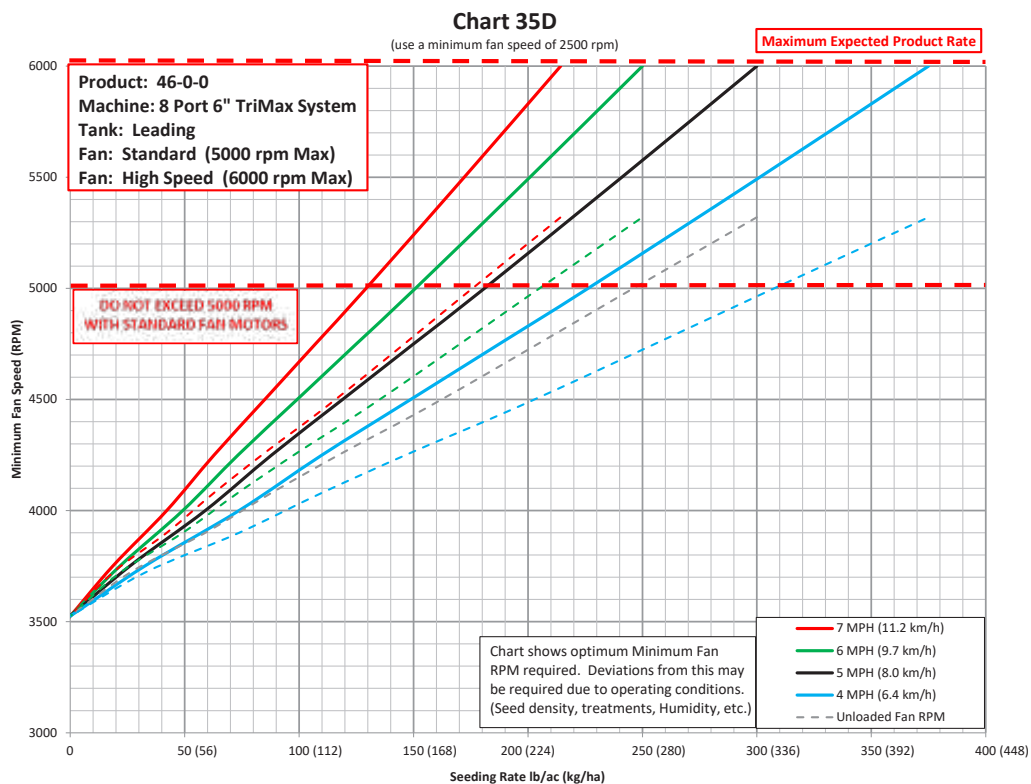


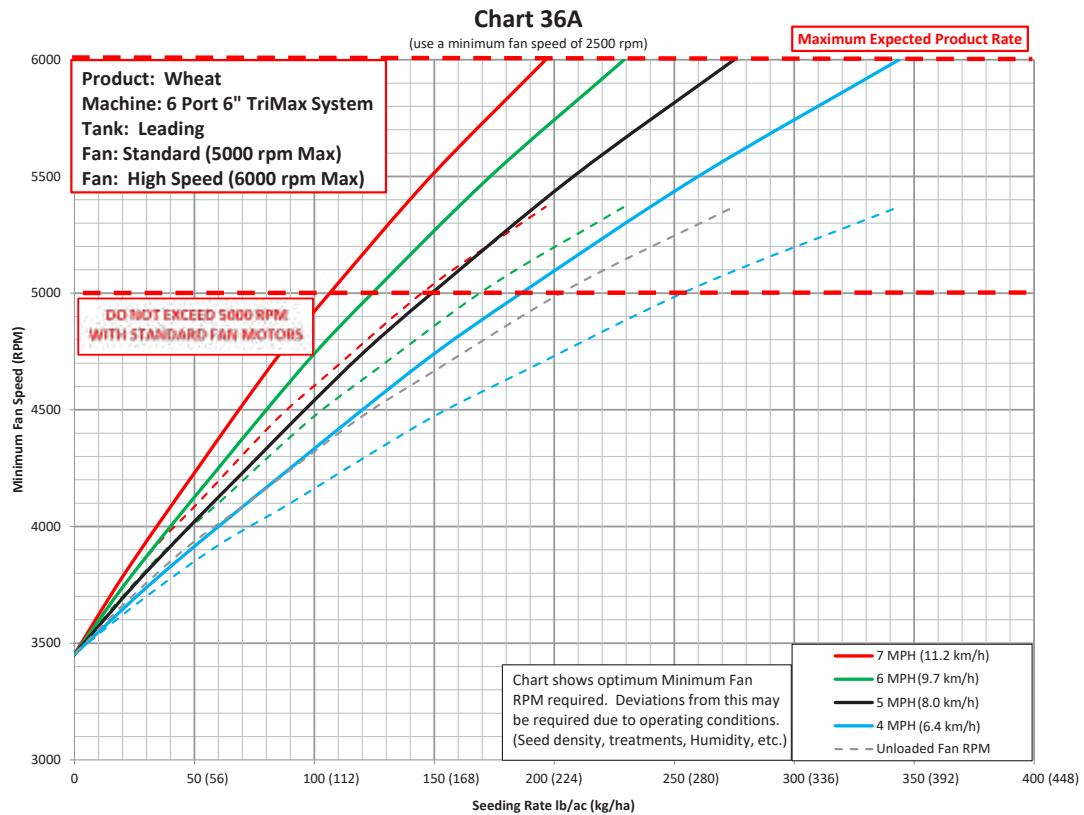
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.



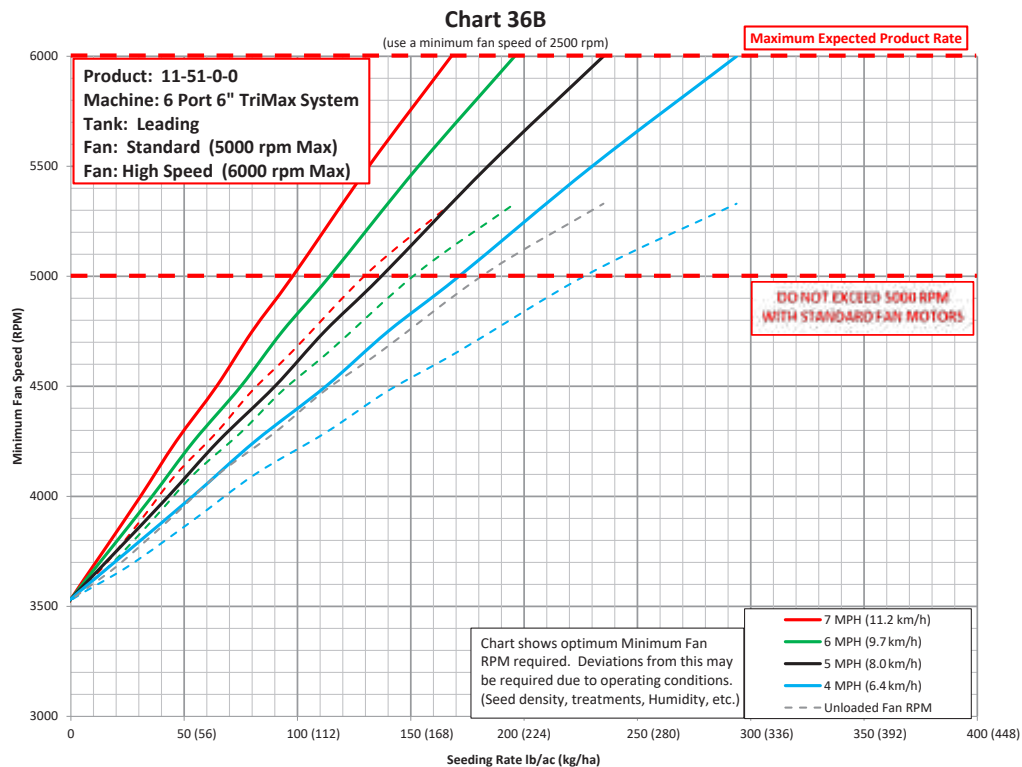


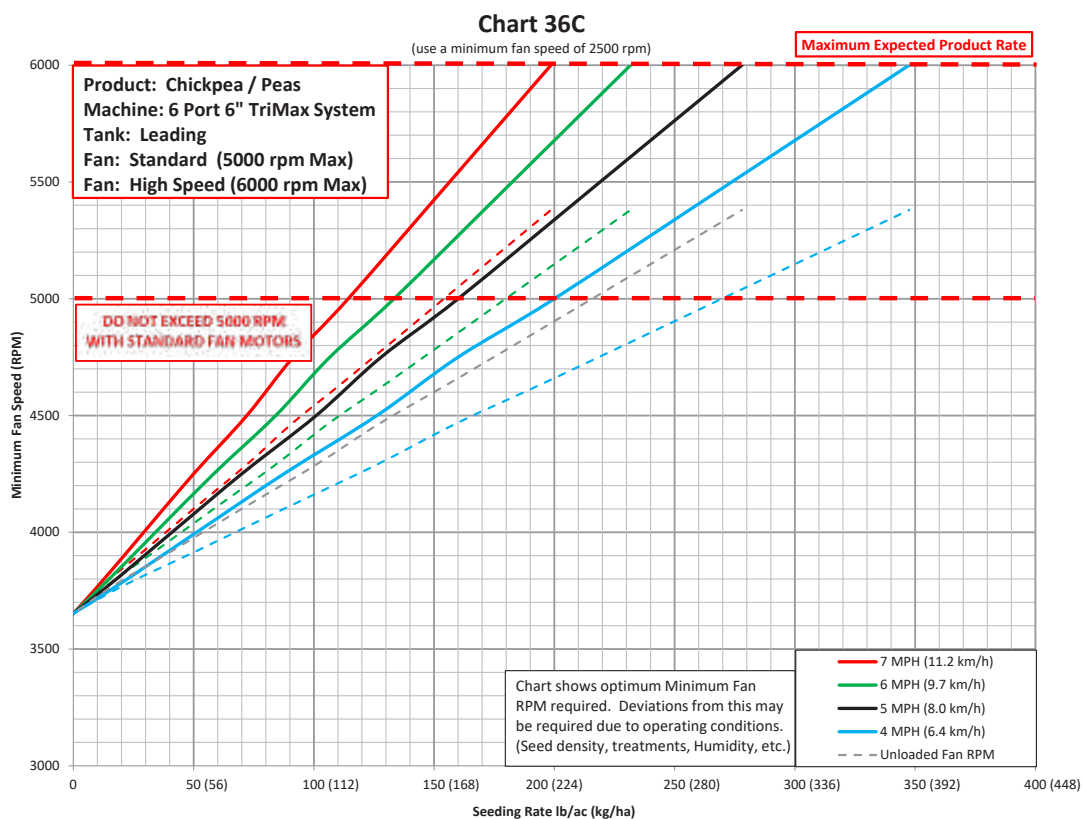
Note: FOR RATES BELOW 50 LB/AC USE A MINIMUM FAN SPEED OF 2500 RPM.





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