2018 Product Guide

(270) 785-0999
Needhamag.com
Pushing Yields and Profits Higher With No-Till And Cover Crops.

After four years of strong commodity markets from 2011 to 2014, we are now in the third year of lower crop prices. While most fertilizer prices have softened, equipment and land rents remain high. Lower profit margins are boosting the interest in conservation programs to reduce equipment, fuel and labor. There is also stronger interest in cover crops, especially those which can help reduce nitrogen rates in corn. While the impact of short-term cover crop rotations are often difficult to measure from a profitability perspective, the dramatic reduction in topsoil losses associated with keeping the soil covered is welcomed, especially following some of the recent heavy rainfall events which dropped 6-10” of rain during a 24 hour period (or significantly more during Hurricanes Harvey and Irma). One of the challenges with cover crops is planting them in a timely fashion, plus warming the soil enough to allow crops like corn to emerge quickly and evenly. Another challenge is weather forecasting more than a few days out, especially during the spring planting season. Patrick Young summed up weather forecasting very well by saying “The trouble with weather forecasting is that it’s right too often for us to ignore it and wrong too often for us to rely on it”.

At Needham Ag Technologies, we continue to invent, field test and bring innovative products to market which help improve crop emergence within challenging no-till conditions like cover crops, to help increase crop yields and profits per acre.

Top Right Image, Ben Needham checks the corn seeding depth after a pass with the Kinze 4 row 3000 series planter we use for research. It’s equipped with Martin WA1360 row cleaners and UMO-100 Fertilizer Openers which part the dense cover crop and position a band of N+P alongside the row. We continue to see the benefits of a consistently placed band of available nutrients alongside the row that the roots can access early in the season.

Right Image. Ben is checking plant health within the same area of the field as illustrated in the first image above. Notice the soil is almost 100% covered to help retain soil moisture and reduce soil loss.
Thermal Imaging

We purchased a FLIR thermal camera to help us better understand the differences in soil warming and its effect on crop emergence and early growth. We quickly observed how fast soil can warm within no-till conditions, especially when most of the residue is parted, to allow the sun to warm the soil. Not all of the residue needs to be removed from the seed zone however, for consistent crop emergence, a uniform amount needs to be moved.

The image above right, illustrates a field of cover crop cereal rye that we made a test pass across early in the season when soils were still cool. We used our 4 row Kinze test plot planter equipped with Martin floating row cleaners and after approximately 1 hour of sunshine, we were able to sense the differences in soil warming created by parting some of the residue and lightly scratching the soil surface. The diagonal pass within the top left corner of the image was made shortly before the photo was taken and illustrates the cooler soil under the residue. We have a short 4 minute video on YouTube which summarizes these observations in more detail, so search for “Needham Ag thermal camera” or scan the QR code below.

Phil Needham was one of the 25 No-Till Legends recognized during the 25th National No-Tillage Conference, held in Saint Louis during January 2017. In the image right, Phil is being presented with the award by Mike Lessiter, President of Lessiter Media. The 25 No-Till Legends were all recognized for their contributions to the growth of no-till from 3.2 million acres in 1972 to nearly 100 million acres this year.
Company owners Phil, Holly and Benjamin Needham.

Contact Us!

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See our agronomy and informative seeding equipment videos on YouTube, look for “Needham Ag”
John Deere Air-Seeder and Box Drill Modifications

This section includes many different options to help cut soil and residue cleanly, then position seeds in the ground to a uniform depth. We also offer firming and closing wheels to press seeds into moisture and close the seed slot better than factory offerings.

Case-IH 500/500T and New Holland 2080/2085 Modifications

This section outlines our new offerings for the Case-IH & New Holland single disc seeders, including our new closing wheel options. We also offer spring spacers, narrow gauge wheels and screens for the hoppers on the Case-IH 500T and New Holland 2085.

Martin Planter Attachments

This section comprehensively covers most of the options to help growers manage residue at planting time with floating row cleaners, in addition to different closing systems to close the seed slot consistently across a wide range of soil conditions.

Tramline Kits

Tramlines have been used successfully by many producers across the country and around the world to help increase yields and profits. This section discusses the different options available.

Stream Bars

Stream bars are the preferred method of delivering liquid N evenly and accurately to wheat, with minimal leaf injury. Research suggests that yield losses of 5-10% are possible when applying liquid N to wheat with flat fan or flood jet nozzles. Stream bars almost eliminate this leaf scorch, by applying fertilizer in streams which bounce off the leaves.

Wheat Management Publications

This section provides information on our Soft Red and Hard Red Winter Wheat guides, in addition to our new Hard Red Spring Wheat guide. These publications are all designed to help producers take their wheat management to the next level.
### Spring Spacers

Adequate down pressure on every opener is essential for consistent soil and residue cutting and depth control, especially on rolling ground. Rotating the 4x4” rockshaft backwards increases down pressure, but once the frame starts to lift additional ballast must be added. Tractor and tow-between air-carts often leave wheel tracks which are almost always lower and more compacted, so they need extra down pressure, relative to all the other openers. This is achieved using spring spacers, see page 19 for more information.

### Seed Brake

Seed bounce is a common problem for many air-seeders and its most likely to occur within the following examples. 1. When planting lighter seeds (such as canola, or cover crops with small seeds). 2. When placing fertilizer in-row with the seed, or within mid-row bands which both require higher fan speeds. 3. When using wider seeding equipment. One (or more) of these examples increase the risk of seeds being blown out of the seed slot, and the seed brake allows most of the air to evacuate through the housing, allowing seeds to fall to the ground by gravity, just like the older box drills. See pages 21 - 22.

### Main Opener Pivots

Tight pins and outer bushings are required to keep the opener running at a 7 degree angle. As these pins and bushings wear, the opener angle often decreases to 6 or even 5 degrees, which cause poor seed placement on account of the seed slot becoming too narrow, plus causing the firming and closing wheels not to track the seed slot. When total side to side play exceeds about 1/2” (measured at the back of the disc) the pins and bushings should be replaced. We have hardened pins and bushings available, see pages 31—32 for more information.

### Disc Blade

The disc must be sharp to consistently cut through heavy and/or tough residue and hard soils. For best results, they should be replaced when the sharp cutting edge becomes dull or when the disc drops below 17” in diameter, whichever comes first.

We now have Forges De Niaux 200 disc blades, with a core hardness which is around 10% harder than competitive disc blades on the market. See page 25 for more information.

### Seed Boot

The seed boot condition and the amount of play in the mounts all have a big impact on seed placement. Once the seed boots begin to get paper thin at the bottom and wear upwards, they need replacing. If you have more than about 3/4” of total up/down travel within the seed boots (measured at the back of the seed boot), we have patented seed boot bushings which eliminate most of the up/down travel. For more information, please see pages 23 - 24.

### Gauge Wheel Axle, Depth Arm And Spindle

As acres accumulate on drills and air-seeders, especially when working in rocky and/or dusty conditions, the gauge wheel axle can seize inside the spindle. Another problem is the depth arm can wear around where it connects to the gauge wheel axle. We have a fix for these problems and more information is contained on pages 37 - 38.
### Bonilla Seed Tab

The Bonilla Seed Tab is thicker than factory and other after-market tabs, which helps hold more seeds within the seed slot. While the Bonilla Seed Tabs are most beneficial on air-seeders, they also help on box drills, especially in no-till conditions. Our Bonilla Seed Tabs are built to match the shape of the seed slot when new, unlike other brands on the market including the OEM ones which are often rectangular. Our Bonilla Seed tabs have been found to last up to 3 times longer than factory tabs. See page 17 - 18 for more information.

### Closing And Firming Wheel Arm Bushings

To make sure the closing wheel runs at a consistent position alongside the seed slot (which maximizes closing action), it is essential that the closing wheel arm bushings are tight. We suggest replacing the closing wheel arm pins and bushings once the closing wheel has 1” of total side to side play, when measured at the rear of the closing wheel arm (1/2” either way). We have a hardened steel pin together with poly outer bushings, plus seals to keep the dust out. This combination doesn’t need to be greased, in fact in dusty conditions we have found they last longer without grease, because grease mixes with the dust and accelerates wear in addition to seizing problems.

You can tolerate more play within the firming wheel arm assembly as it still follows the seed slot even with a worn pin and bushings, however the pivot points tend to wear very quickly once there is approximately 1/2” of total play, measured at the back of the firming wheel arm (1/4” either way). For more information see pages 29 - 30.

### Closing And Firming Wheel Arm Springs

As acres accumulate on the John Deere single disc openers, the firming and closing wheel arm springs wear within their ID. This causes them to reduce tension and eventually break. We have firming and closing wheel arm springs available with more side tension to help stop them vibrating out of the pegs, which happens more often when seeding at higher speeds or in more rolling fields. For more information visit page 33.

### Closing Wheels

Factory cast closing wheels perform to a satisfactory level in most drier conventional soil conditions, but they often struggle to close the slot consistently within moist no-till conditions, especially when covered with heavy residue. We have evaluated many different wheel thicknesses and tooth profiles across a range of different soils and soil moisture conditions and have found the 1/2” thick crumbler wheel offers the best combination of seed to soil contact and slot closure across a wide range of soils and soil moistures. The 1/2” thick wheel is wide enough to stay on top of loose dry soils, compared to thinner wheels which can descended too far into the soil and throw seeds out. The rounded teeth around the wheel also significantly reduce bouncing compared to the factory closing wheels, which helps provide more consistent slot closure across the field. See pages 9 — 11 for more information.

### Firming Wheel

This is a very important part of any disc drill or air-seeder, especially when planting into marginal soil moisture conditions, where a firming wheel can make the difference between getting a stand or not. The function of the seed firming wheel is to press seeds down into moisture to help obtain uniform germination and emergence. We have seen examples where a seed firming wheel was removed and poor emergence resulted, compared to adjacent rows with firming wheels which had a stand. See pages 7 - 8 for more information on our new V8 Firming Wheel with a urethane tire, the only firming wheel on the market specially designed to match the shape of the seed slot.

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For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
Needham Ag V8 Firming Wheel
With New Flexible Urethane Tire

Key Benefits:

- The popular and proven Needham Ag V8 Firming Wheel now features a flexible green urethane tire to help extend service life. The urethane tire retains the same amount of flexibility as the former rubber tire, plus it continues to have the same tapered profile, the only one on the market which matches the seed slot. This tire profile imprints seeds into the bottom of the seed slot across a wide range of soil types and soil moisture conditions, to maximize seed to soil contact and the standards of emergence, especially within no-till conditions, or when seeding in marginal moisture conditions.

- Proven performance - We have had customers tell us they have seen an improvement in crop emergence when they compared V8 wheels to factory wheels on their John Deere drills or air-seeders.

- The only firming wheel on the market designed by an agronomist who created concrete molds of the seed slot. These molds revealed that the wheel profile needed to be narrower than current and previous factory firming wheels, plus it needed to be slightly tapered on one side to match the seed slot shape (especially within firm no-till soils).

- The tire and bearing are both replaceable, unlike some other brands on the market, which require complete wheel replacement if the bearing or tire fails.

Flexible 10” urethane tire allows the wheel to remain down at the bottom of the seed slot, even when making slight turns (illustrated left) or when working on side slopes.

The flexible urethane material also helps shed mud, which is important when working in higher moisture soil conditions.

Flexible Urethane Tire

5203 PEER® SeedXTreme Heavy Duty Bearing Is Standard In Needham Ag V8 Wheels With Urethane Tire.

Other Firming Wheels On The Market Include Cheap And Narrow, Light Duty 203 Single Row Bearings, Which Often Don’t Last Within Dry Dusty Conditions.

The Needham Ag V8 firming wheel is specially designed to match the shape of the seed slot.

Its shape helps collect and press seeds down into moisture, as illustrated right and within the image above left.

This principle is especially important when seeding into marginal moisture conditions, because it often the difference between getting a good stand and a poor stand.

Visit our website at www.needhamag.com, for additional information.
For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com

Assembled V8 Firming Wheels (With Urethane Tire) are available for John Deere 50, 60 and 90 series and Case-IH SDX air-seeders.

Price (including longer 5/8” bolt, washer and nylon lock nut) $45.00 + shipping.

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**John Deere 1 x 10” firming wheel.**

These were fitted to most JD drills and air-seeders until 2006.

This 1” wide wheel design is too thick to fit down into the seed slot within most no-till conditions because the seed slot often measures between 5/8 and 3/4” in width (see image right).

**John Deere 0.8 x 9” firming wheel.**

These have been fitted to all factory drills and air-seeders since summer 2006.

While this wheel design was definitely an improvement over the original 1 x 10” wheel, its still too wide for most no-till soil conditions. We have found it either doesn’t press seeds down to the bottom of the seed slot because its too wide, or if additional down pressure is added to the wheel, it can tear out moist no-till sidewalls from the seed slot (see image right).

**Needham Ag V8 Firming Wheels**

These were introduced in 2008 and they were designed by making molds of the seed slot. We tied up the firming wheel and closing wheels on different drills and air-seeders to leave a clean seed slot. We sectioned off short lengths of the seed slot filled them with quick-setting concrete to create molds.

Initially we went to a US manufacturer with the concrete molds and had them make us a rubber tire which matched their profile and the Needham Ag V8 Firming Wheel was born. More recently we switched to a flexible urethane tire (made in the USA), which further extends performance and service life.

Notice how the Needham Ag V8 wheel presses soybean seeds down to the bottom of the seed slot when no-tilling into corn stalks.

Contains the high quality 5203 Bearing

See our new V8 Wheel video on YouTube. Type “Needham Ag V8 Firming Wheel With Urethane Tire” or click the QR label below.
Martin 20 Point Crumbler Wheels For Case-IH SDX and John Deere 50 Series Drills and Air-Seeders

Key Benefits:

- 20 point crumbler wheels close the seed slot significantly better than factory cast closing wheels, especially within residue covered, moist no-till conditions.
- They feature the long life 5203 bearing (the same one which comes standard within the JD factory gauge wheel assemblies). This helps eliminate the bearing failures associated with the factory JD 50 series closing system.
- They bounce 20% less than factory cast wheels.
- 20 point crumbler wheels are made from a very wear resistant T1 (military grade) steel that’s heat treated. When the wheels wear out (after many, many acres) the wheels can be replaced, rather than replacing the complete wheel assemblies (like our competitors). For high moisture soils, the 20 point wheel can be switched for a 13” spiked closing wheel (shown on page 11).

The Problem: Establishing a uniform stand is the foundation for high yields. Look at the image to the left and see how the factory John Deere 1” firming wheel and standard cast closing wheel combination performed when planting soybean into a higher moisture no-till field. There are at least two problems with this combination:

1. Seeds were not pushed into the base of the seed slot on account of the original 1” wide firming wheel being too wide. Pressing seeds to the bottom of the seed slot is critical to obtain uniform seed placement and uniform emergence, especially when planting in soils with marginal moisture or rapid soil drying conditions.
2. The seed slot was not effectively closed and many seeds will likely perish if dry weather immediately follows planting.

While it’s difficult to close the seed slot in wet clay soils, growers have found that the Martin 20 point crumbler wheels close the seed slot significantly better than the factory cast closing wheels and other after-market closing wheel options.

Martin 20 Point Crumbler Wheels For 50 series John Deere drills/air-seeders, including a cast hub with long life 5203 bearing, plus longer axle (to accommodate the wider bearing), plus all the hardware to install on the original 50 series John Deere closing wheel arm, as illustrated left.

$125.00 per row + shipping. 20 lb ea.

Martin 20 Point Crumber Wheels for Case-IH SDX

$120.00 per row + shipping. 19.5 lb ea.

Visit our website at www.needhamag.com, for additional information.
Martin 20 Point Crumbler Wheels For John Deere 60 and 90 Series Drills and Air-Seeders

Key Benefits:

- 20 point crumbler wheels measure 1/2” in thickness, almost twice the width of our competition which frequently struggle to press soil around the seed in loose field conditions. Also, growers have found the 1/2” wide wheel is less sensitive to closing arm play (side to side) than the narrower versions available on the market, which struggle with worn arms.
- 20 point crumbler wheels are made from a very wear resistant T1 (military grade) steel that is heat treated. When the wheels wear out (after many, many acres) our wheels can be replaced, rather than replacing the complete wheel assemblies (like some of our competitors). For high moisture conditions, the 20 point wheel can be switched for a 13” spiked closing wheel (wheel shown on page 11).
- 20 point crumbler wheels will close the seed slot better than the standard factory cast closing wheels across a wide range of conditions.

“The 20 point crumbler wheels blow the factory cast wheels out of the water!.

I bought one crumbler wheel and when I compared seed emergence and slot closure to the factory wheels, I ordered an entire set of crumber wheels.”

Tyler Stefansen, Prague, Oklahoma.

The image below shows a 60’ wide John Deere 1890 equipped with the Martin 20 Point Crumbler Wheels, in addition to the Needham Ag 18” Disc Blades, Bonilla Seed Tabs and V8 Firming Wheels.

Martin 20 Point Crumbler Wheels For 60 or 90 series John Deere drills/air-seeders, including all mounting hardware to couple to the original 60/90 series John Deere closing wheel arm, as illustrated within the images above and left.

$87.50 per row + shipping. 18.5 lb ea
Some areas that we work with received 15-20” of rain during the spring planting season of 2016. While we definitely don’t recommend planting in higher moisture conditions like the example shown below, many producers were forced to run as more wet weather was forecast and they actually made good crops because of the moisture. In higher moisture soil conditions, many producers find the Martin 13” spiked closing wheels performed better than any other brands tested, plus they helped eliminate sidewall compaction.

**Key Benefits**

- Martin 13” spiked closing wheels are recommended for growers who regularly no-till into higher moisture soils, especially residue covered clay soils.
- Spiked closing wheels engage the soil to close the seed slot and leave loose soil above the seed to help speed emergence.
- Martin 13” spiked closing wheels are available to fit on the 50, 60 and 90 series closing wheel arms.
- Martin 13” spiked wheels are not recommended for use in tall cover crops such as cereal rye that’s taller than say 18-24” tall or wrapping can occur. If you plan to seed into such conditions, consider the Martin Razor wheel, shown on page 48.
- **Prices are the same for the Martin 13” spiked closing wheels as the Martin 20 Point Crumbler Wheels illustrated within the previous 2 pages for the 50 series and the 60/90 series.**
New PEER® SEEDXTREME 5203 Bearings

Proven through years of research, development and rigorous testing in both lab and field, the advanced sealing technology within SEEDXTREME bearings significantly extends service life, especially in dusty conditions.

Key Benefits

- The PEER® SEEDXTREME 5203 bearing is a direct replacement for standard 5203 bearings to significantly extend their life.
- Features 6 seals at each end, compared to most competitive bearings only having 2-3 seals at each end.
- Fits most gauge wheels and closing wheels that use a 5/8” or 16 mm mounting bolt.
- Inside diameter 0.64” (16.256 mm)
- Outside diameter 1.574” (40 mm)
- Width 1.737” (44.12 mm)

Mud Slurry Test Hours

PEER’s Research and Development Center utilizes mud slurry testing to thoroughly study new bearing and seal concepts. Mud slurry testing involves immersing bearings in an abrasive liquid and counting the number of hours before they fail under a consistent load. Most bearings within the agricultural environment break down because the seals deteriorate, which allows contaminants to enter the bearing and dry the lubricants, rather than bearings failing directly.

Mud slurry tests are performed to compare the life of different brands of bearings within the same environment. The bar chart above compares the life of three different brands of 5203 bearing at 500 rpm in the mud slurry tank. The one on the right is the PEER® SEEDXTREME, which lasted more than three times longer than one major 5203 bearing manufacturer and over 7 times longer than a 2nd major 5203 bearing manufacturer.

New PEER® SEEDXTREME 5203 Bearings

$15.00 + shipping.

0.5 lb ea.
3” x 16” Narrow Gauge Wheel Tires

Urethane Tires to Replace Rubber John Deere or After-Market 3” Narrow Gauge Wheel Tires.

Key Benefits

- Almost every day we receive calls from growers who tell us their factory or after-market rubber gauge wheel tires failed, especially when seeding into short soybean stubble. Most rubber tires become pitted or split, similar to the rubber tire illustrated right.
- To significantly increase service life we now offer 3” urethane tires. These replacement tires are green in color and quickly install within ALL 3” John Deere narrow gauge wheel assemblies, including part numbers AA66988 and AA56719.
- These green tires replace John Deere tire part numbers A85133, A75354 and A84349. They also fit on aftermarket 3” narrow gauge wheel assemblies which come with 3” Carlisle rubber tires. These include the narrow gauge wheel assemblies currently distributed by Shoup, Pro-Mags, Ridgeland Manufacturing and Mud-Smith. They also fit the narrow gauge wheels which come standard on the Bourgault 3710/3720 single disc drill.
- Tires are made from a high density urethane material which resists tearing and cracking, even when seeding thousands of acres per year into short soybean stubble.
- Very easy to install within the wheel halves (please view the youtube video below). They push inside the wheel halves by hand, unlike the rubber tires which often need a special press to install.

* We are so confident in our urethane tire durability, we now offer a 3 year free tire replacement warranty, against tears and significant stubble damage to the OD of the tire for a period of 3 years after date of purchase.

Our 3 x 16” Narrow Gauge Wheel Tires also fit on the narrow gauge wheels supplied by Bourgault, including the ones which are currently standard on their 3710 and 3720 single disc no-till drills.

3 Year Warranty On Tire*

Visit our website at www.needhamag.com, for additional information.
Key Benefits

- Our Carlisle spoked narrow gauge wheel assemblies come complete with the Needham Ag long life 3” green urethane tire. The OD of these tires are warrantied for three years following the purchase date (We are the only company we believe to offer a gauge wheel tire warranty).
- Large open area to allow wet soil to escape out of the gauge wheel assembly, this is most important when seeding into higher moisture clay soils.
- Strong ductile iron triple spoke center is held against the wheel halves with 9 bolts for excellent strength.
- Includes a bearing socket and the 5203 PEER® SeedXTreme long life bearing. This design eliminates the need for a separate hub and eliminates any play between the bearing and wheel halves over time. This is especially important for growers who are planting in rocky soils, which often accelerate the wear around the bearing within the wheel halves.
- Fits all John Deere single disc openers and most other drills and planters which use 16” diameter gauge wheels which are mounted with a 5/8” or 16mm bolt.
- Uses existing mounting bolt.

The Problem:
We don't encourage growers to plant whole fields that aren't fit, but we do recognize growers often want to plant fields that are +/- 95% ready to go. If you can plant the whole field and get an acceptable stand within the remaining 5%, then your money ahead, compared to coming back to plant that small area. The common challenge with planting the wetter areas is mud accumulating inside the gauge wheels and causing them to drag, such as illustrated right.

Watch us durability testing the Carlisle spoked narrow gauge wheel assemblies with the green 3” urethane tire across rocks at 8 mph. We used full down-force and removed the disc blade to ensure the gauge wheels had maximum impact. Search for "Needham Ag Spoked Narrow Gauge Wheels" at YouTube.com or scan the QR label to the left.

Carlisle 16” Spoked Narrow Gauge Wheel Assembly With 3” Wide Long-Life Urethane Tire.

$160.00 per row + shipping. 16 lb ea.
2 3/4 x 16" Narrow Gauge Wheels
Includes Dense Urethane Tires For Long Life

Key Benefits:

- 2 3/4 x 16" Narrow Gauge Wheels are almost half the width of a standard 4 1/2" gauge wheel, which allows improved ground following and better depth control, especially in no-till conditions such as corn stalks.
- Narrow gauge wheels are designed for no-till, but they can be used in conventional soils as long as the ground is firm and the drill or air-seeder down pressure is adjusted properly.
- Our gauge wheels feature urethane tires, a material which significantly improves service life compared to rubber (see the bar chart on the following page. We have had the black urethane tires out in the field for 6 years now, without a single reported OD failure and many of these tires are working in cotton or short soybean stubble.

* We now offer a 3 year free tire replacement warranty against tears and significant stubble damage to the OD of the tire for a period of 3 years after date of purchase.

The Problem.
Factory installed 4 1/2" wide gauge wheels work well in conventional soils, but they don’t perform as well in no-till fields. This is because their wider profile causes them to climb up over more residue, which negatively impacts seeding depth. Many growers have seen narrow gauge wheels improve seeding depth consistency by better following the contours of the soil surface and avoiding more residue (when compared to the wider 4 1/2" wide gauge wheel).

These problems are illustrated within the diagram to the left. Notice how the standard 4 1/2" gauge wheel (1) holds the disc out of the ground by riding on the shoulder of a soil surface depression (B). The 2 3/4" narrow gauge wheel (2) by comparison, is better able to drop down into the same depression (B) to help achieve more consistent seeding depth.

Narrow gauge wheels are also very beneficial when seeding into heavy residue such as corn stalks, because the tires have less width to contact residue. The image to left illustrates how 4 1/2" gauge wheels climb over corn stalks, lifting the disc blades out of the soil. In this example, it positioned too many winter wheat seeds on the soil surface, where they probably won’t survive a hard winter.

Visit our website at www.needhamag.com, for additional information.
X-16” Narrow Gauge Wheels are designed to install on all John Deere single disc seeders, Case-IH SDX and Precision Disk 500 air-seeders and most corn planters which utilize a 5/8” or 16mm mounting bolt.

$105.00 each + shipping (includes 3 x 5/8” ID spacers per Gauge Wheel). 14.1 lb ea.

Replacement urethane tires for the 2 3/4” x 16” Narrow Gauge Wheels.
(they don’t fit on John Deere gauge wheels, but the tires on the page 13 do fit them)

$65.00 each + shipping. 5.1 lb ea.

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com

The image to the left compares the Needham Ag 2 3/4” narrow gauge wheel assembly to a 4 1/2” gauge wheel. We have found that the wider gauge wheels are preferred in soft, conventional tilled fields, but within no-till fields the narrow gauge wheels are a much better option for terrain following and improved depth control in heavy residue such as corn stalks.

The second image (below left) shows a Needham Ag 2 3/4” narrow gauge wheel fitted to a drill which is no-tilling into corn stalks. Notice how it avoids residue that a wider tire would have climbed up over. When gauge wheels climb over heavy residue like this, seeds are often dropped on the soil surface where they rarely survive.

Our 2 3/4” narrow gauge wheel tires feature 1/4” of relief. Relief (also termed “reduced inner diameter” or “RID”) help minimize the amount of sidewall compaction in higher moisture soils by leaving a loose strip of soil next to the disc blade. This band of loose soil helps improve closing system performance. Our RID profile is around 1/3 of the standard RID gauge tires (such as the ones illustrated on page 52), making these gauge wheel tires perform across a wide range of soil conditions including dry no-till soils.

All urethane materials are not created equal. Take for example the bar chart to the right, where our Needham 2 3/4” urethane tire was compared to a competitors urethane tire and a competitors rubber tire. The graph represents an ASTM test (D-1938). ASTM is an international standards organization which develops and publishes technical standards for a wide range of materials. In this example it’s a tire tear resistance test, which simulates the piercing conditions such as when seeding into short soybean or cotton stubble. The Needham 2 3/4” urethane tires clearly outperformed the rubber and competitive urethane tires by a big margin. This is further reinforced by growers that didn’t make it through the first season when no-tilling into short soybean stubble with competitive rubber tires. They switched to our 2 3/4” urethane tires and have now used the same tires for at least 6 years, no-tilling into similar conditions.
**Key Benefits:**

- Bonilla Seed Tabs install on all 50 and 90 series seed boots (on both box drills and air seeders).
- Bonilla Seed Tabs are made of a 5/16” thick UHMW, a flexible but very hard wearing material.
- Bonilla Seed Tabs are almost twice as thick as factory seed tabs and they are also angled at 7° to follow the seed slot. This enables them to retain more seeds within the seed slot and help reduce wear over time.
- Field testing has determined the Bonilla Seed Tabs last up to 3 times longer than the factory installed white plastic seed tabs.
- Color may vary depending on product availability.

**The Problem.** Many John Deere drills and air-seeders struggle to hold seeds in the seed slot, especially when no-tilling into heavier residue. This becomes an even greater challenge when operating at higher speeds at shallower seeding depths. While these concerns are more pronounced with air-seeders, because they can also blow seeds out of the seed slot, it can also happen with no-till box drills such as the 750/1590. We have spent hundreds of hours studying and comparing different seed tab designs and more recently we have been using high-speed cameras to improve our designs. The screen captures on the following page are all taken from our “Needham Ag - Bonilla Seed Tab” Video on YouTube. We suggest you watch this video as there are many very good tips to help retain more seeds in the seed slot and improve seeding performance.

**The Solution.**

- Bonilla Seed Tabs are almost twice as thick as the factory seed tabs, this makes them rigid enough to hold seeds down in the seed slot where they belong, as illustrated in the image to the right.
- Bonilla Seed Tabs are specially tapered to match the shape of the seed slot as illustrated right. We have spent many years observing and perfecting their design. Other competitive tabs don’t match the shape of the seed slot, which results in seeds escaping out of the seed slot.
- Bonilla Seed Tabs are longer than competitive seed tabs which extends their working life. See the image below for a comparison of seed tab lengths.

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What a farmer has to say about our Bonilla Seed Tabs

“Everyone knows that seed placement is important, but to make it happen is another story. I have found that Needham Ag has the perfect tool to get the job done with the Bonilla Seed Tab. I can put the seed in the bottom of the seed notch every time. I no-till into fields including pasture and grass. Grass will keep seeds from falling to the bottom of the seed notch, the Bonilla Seed Tab will push the seed to the bottom of the notch so that I plant 100% of my seed to the depth I have the drill set for. The Bonilla Seed Tab is made to match the exact angle of the disk opener. So what that does for me is any seed that comes out of the seed tube is always pushed and held down to the bottom of the notch with the Bonilla Seed Tab”.

John Murphy, Owensboro, Kentucky.
Bonilla Seed Tabs For 50 and 90 Series Box Drills and Air-Seeders.

(Bonilla Seed Tabs are not currently available for 60 series)

$4.00 each + shipping.

Note: John Deere 90 series extended wear seed boots require a longer bolt and locking clip (Bonilla Seed Tabs will fit on all other 50 and 90 series boots with existing factory bolt).

Stainless Steel Bolt $0.25
U Shaped Clip $0.50
Spring Spacers For John Deere Drills And Air-Seeders

Key Benefits:

- Spring Spacers are available for John Deere 50 series and 60/90 series single disc openers.
- Spring spacers are easily installed within the spring assembly and they increase the opener down pressure by 80-90 lb.
- Depressions caused by tractor or tow between air-cart tires cause openers to descend downwards. When the openers descend, spring pressure is actually reduced in rows where it should actually be increased, to maintain seeding depth within the denser areas of the field.

The Problem: While working with producers, Phil Needham found numerous crop emergence problems, caused by inadequate seeding depth behind heavy air-cart tires and/or heavy tractor wheel tracks. Wheel track depressions cause disc openers to extend downwards, which de-tensions the down pressure assembly and reduces down force. This results in poor residue cutting and reduced soil penetration.

The Solution: Phil Needham designed spring spacers which are easily fitted to 50 and 60/90 series single disc openers. They are installed by de-tensioning the down-pressure spring assembly, inserting the spring spacer at the top end of the spring, then re-tightening the locking nuts. Spring spacers increase the down pressure in wheel tracks to help cut through residue and compacted soil to help improve crop emergence.

The ends of each spring spacer are angled to prevent them vibrating out of the spring assembly.

Spring Spacers for 50 series John Deere openers: $25.00 each + shipping. 1.2 lb ea.
Spring Spacers for 60/90 series John Deere openers: $25.00 each + shipping. 1.1 lb ea.
Needham Ag Seedliners For John Deere Air-Seeders

Key Benefits:

- Seedliners are exclusively available from Needham Ag Technologies, LLC.
- Seedliners are available for 50, 60 and 90 series John Deere air-seeders, up to serial number 740100 (released July 2010).
- They were designed by Phil Needham to help reduce the impact of fragile seeds (such as peas, canola, soybeans and dry edible beans) hitting the center of John Deere steel manifold covers and bouncing back down.
- Seedliners are designed to diffuse the energy of the seeds hitting the middle of the steel cover and deflect them out radially to the seed tubes.
- Manufactured from highly wear resistant material for long life, even when using fertilizer and seed combinations.

Seedliners quickly and easily install under the steel manifold cover on the main mounting bolt (as shown above). Just undo the nut, remove the steel cover, and nest the seedliner between the cover and rubber manifold. Once the nut is tightened it provides a sealed environment to keep moisture out.

Color may vary from photos shown.

The Problem.

Without seedliners, fragile seeds such as canola, soybean, peas, lentils and dry edible beans are blown at the center of the steel manifold cover at speeds of 35-45 mph (as shown in the photo to the left). This impact causes the seeds to hit the steel cover, come to a dead stop, then bounce back downwards before being blown out to the seed hoses.

Seed processors do not want to drop soybeans more than 3’ when handling the seed, for risk of damaging the seed coat and reducing germination!

The Solution

Seedliners help reduce the impact of seed hitting the middle of the steel manifold cover, by diffusing the seed radially to the seed outlets, using a cone shaped diffuser.

Seedliners for John Deere 50, 60 and 90 series air-seeders: **$49.00 each + shipping.**

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
Needham Seed Brakes

Key Benefits:

- Our Seed Brake incorporates a 1mm thick stainless steel housing for excellent durability, plus 2mm holes which allow our Seed Brakes to sow small seeds (including most cover crops).
- Seed Brakes are designed for disc type air-seeders to reduce seed bounce and help prevent seeds being blown out of the seed slot.
- Growers claim they have reduced seeding rates, because more seeds are placed within the seed slot, NOT blown out as shown below right.
- They are built to accommodate the standard 1 1/4” outside diameter seed hoses, common to John Deere and Case-IH air-seeders.
- Seed Brakes feature an inner downward angled baffle, which helps reduce seed velocity and seed bunching. Research shows they improve in-row seed spacing by over 2.0 standard deviation points (visit needhamag.com and select the seed brake section for additional statistical information for this product).

The Problem. As more and more farmers use air-carts to position fertilizer blends in the row, along with the seed, significantly higher fan speeds are required to convey both products to the openers, especially with larger seeding widths and faster seeding speeds. With these increased fan speeds comes the increased risk of seed (and fertilizer) being blown out of the seed slot (as illustrated right). Coupled to the fact that many growers use fan speeds that are too high (mainly because if they ever plug the hoses, they raise fan speeds to prevent it happening again), seed bounce and seeds being blown out of the slot are therefore becoming a more common problem.

The Solution. Seed brakes are clamped vertically, above the seed tube on John Deere and Case-IH air-seeders (as illustrated left). They are curved to allow positioning under frame members, maintaining close to vertical orientation for good seed flow. They are easy to install, just cut the secondary seed hose about 2” above the steel seed tube and clamp the seed brake in position at the top and bottom with the hose clamps supplied. Seed brakes also feature a downward angled baffle which helps roll seeds around the inner radius, to help reduce the seed clumping associated with most air-seeders. This baffle should be positioned upwards, towards the top of the seed brake for best performance.

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com. Visit our website at www.needhamag.com, for additional information.

Made from stainless steel for durability and corrosion resistance

Seeds blown out of seed slot costs $$$

John Deere’s new 0.8” x 9” firming wheel is too thick to fit down into the seed slot.

Seeds now fall to the ground by gravity (rather than at high speed, which frequently results in seeds being blown out of the seed slot).

We now have Seed Brakes For 1”, 1 1/4”, 1 1/2” and 2” Hoses.

1 1/4” Seed brakes for John Deere 50, 60 and 90 series air-seeders. They also fit Case-IH SDX and Precision Disk 500 air-seeders, plus New Holland 2080 and 2085.

$27.95 each + shipping.

Visit our website at www.needhamag.com, for additional information.
Key Benefits:

- We have some customers that wish to plant large seeded crops such as peas, at high seed rates of 200-250 lb./ac. This becomes a challenge for our standard seed brakes with the internal baffle, as they slow the seed flow and can cause plugging (especially on 10” or wider spacing). So we now offer 1 1/4” seed brakes without the internal baffles for these growers.
- The stainless steel material and the size of the holes remain the same as the standard seed brakes with baffles.

1 1/4” Seed brakes without baffles for John Deere 50, 60 and 90 series air-seeders and Case-IH Precision Disk 500 and SDX air-seeders:

$25.95 each + shipping.

(Two Heavy Duty Hose Clamps Supplied With Each Seed Brake)

Stainless Steel Y Brakes

Key Benefits.

- Needham Y Brakes are designed to merge two 1 1/4” hoses into a single 1 1/4” hose. They are used within tramline kits (illustrated on page 54) and also by growers that mount air-tanks (such as Gandy systems) on air-seeder toolbars. They allow small seeds (like canola or most cover crops) to be metered by Gandy systems and merge with seed and/or fertilizer flow to the seed boots or openers.
- The Needham Y Brakes incorporate 2mm holes, which allow the seeding of most crops, down to smaller seeds including ryegrass, canola and radishes. They are not recommended for seeding smaller seeds, such as alfalfa unless the holes on the lower half of the Y brake are temporarily sealed with masking tape.
- Made from 1mm thick stainless steel for long life.

Stainless Steel Y Brakes for 1 1/4” hoses, with 3 hose clamps.

$40.00 each + shipping. 0.55 lb ea.
Needham Seed Boot Bushings For John Deere 50, 60 and 90 Series

The Problem

As acres accumulate on John Deere drills and air-seeders, the holes which mount the seed boots to the opener arm become egg shaped. Together with wear in the boot holes and bolts, this results in significant up/down travel of the seed boot. This allows the seed boot to lift, where it can spray seeds out onto the soil surface (especially in no-till fields).

Excess up/down seed boot play is often the primary cause of seeds on top of the ground and poor stands. There are three sources of play and these include: 1) Worn holes in the seed boot. 2) Worn holes in the arm and 3) worn bolts. Our bushing kit addresses all three of these wear points, unlike competitive kits on the market that just fix the worn holes within the opener arm.

For more information on how the Needham Ag Bushings work, search for “Needham Ag Installing Seed Boot Bushings” at youtube.com or scan the QR Code (right).

The Solution:

Needham Ag Seed Boot Bushings are manufactured from a high grade, heat treated stainless steel material to provide excellent durability characteristics and long life. Our bushing kit also allows growers to move the boot to the lower hole in the arm, such as what’s required when seeding small seeds (including canola or alfalfa) less than 1” deep.

How are the bushings installed?

First, using a heavy drill press, the existing holes within the seed boots need to be drilled out with a 0.635” drill bit (illustrated right). Next, the 5/8” bushings are inserted into the seed boot lugs (image above left) and the boots are installed on the arms and the bolts are pushed through the boot. Once the nuts are torqued, the bushings clamp tightly to the arm and the boots pivot on the bushings. This is a long term fix, plus by extending the pivot points outward, it helps eliminate play over time.

What a farmer has to say about our seed boot bushings:

"After 18 years of no-till, we realized we had issues with our John Deere 1850 air-seeder. We traced the problem down to the seed boots which had 1 1/4” of vertical play and this was causing lots of seeds on top of the ground. We installed a set of Needham Seed Boot bushings and it eliminated the play in the seed boots. We reduced our soybean population by 20,000 seeds per acre and had way better stands. Our agronomist says he is not used to these kind of stands behind an air-seeder".

Danny Wipf. Lake Andes, South Dakota.
For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
Niaux 200 Extended Wear 18” Disc Blades For John Deere Drills and Air-Seeders.

Key Benefits:

- 8 years of research resulted in the creation of a new disc blade. A disc with superior materials and patented heat treating process which produces a core hardness around 10% greater than the closest competitors on the market. The result is a new disc blade called Niaux 200. This new disc provides improved life with better sharp cutting edge retention. This is especially important when seeding into hard soils covered in heavy, tough residue, while maintaining flexibility to resist breakage in rocky conditions.

- Made in France by Forges De Niaux, a company with 5 generations of manufacturing, using high quality materials, automated processes and sound quality control.

- Needham Ag field tested the Niaux 200 disc blades alongside competitive disc blades in 2016 and 2017, on growers who plant high no-till acres per year with heavily ballasted seeding equipment. We found the Niaux 200 disc blades retained more diameter, but more importantly they retained their sharp cutting edge longer than other brands tested.

- Long term field research shows the Niaux 200 disc blades retain around 20% more diameter on average than the competitive disc blades shown on the following page (range 10-30%).

For more information on why the Niaux 200 disc blades are better than other brands search for “Needham Ag Disc Blades” at youtube.com or scan the QR Code left.

“In 2016 we installed a Forges De Niaux 200 disc blade alongside John Deere factory disc blades at the same time on our 36’ John Deere 1890. We covered 3600 acres (including ground with rocks) and the John Deere discs measured 17 5/16 and the Forges De Niaux 200 disc measured 17 7/16 (1/8” greater). The biggest difference was the cutting edge, we found the Forges De Niaux 200 was still sharp, compared to the John Deere blades which were dull.”

Eli Robey. Robey Farms, Adairville, Kentucky.
Hardness Values: Three Different Brands of 18” Flat Disc Blades
Scale: Rockwell C Scale, using Wilson 5JR BB 1537 Hardness Tester.

Hardness Test Locations

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<thead>
<tr>
<th></th>
<th>Average Hardness [Rc]</th>
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<tr>
<td></td>
<td>At Outer Surface</td>
<td>At Milled Center</td>
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<tr>
<td>John Deere</td>
<td>48.7</td>
<td>50.4</td>
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<tr>
<td>(August 2017)</td>
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<tr>
<td>Ingersoll Canada</td>
<td>49.6</td>
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<td>(May 2017)</td>
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<tr>
<td>Forges De Niaux</td>
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<td>200 (May 2017)</td>
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For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
Key Benefits:

- Significantly sharper than factory disc blades.
- Specifically engineered to cut through tough, heavy residue.
- Manufactured with time-tested Ingersoll proprietary Boron steel.
- Ingersoll blades resist chipping and cracking in rocky conditions.
- Penetration in hard, dry soil conditions is unparalleled.
- Install on John Deere 750, 752, 1560, 1590, 1690, 1850, 1860, 1890, 1890CCS, 1895 and 1990 (They replace John Deere part numbers N283804 and N214190).
- Blades are 5mm (0.197”) in thickness and have a Rockwell C hardness of +/- 50 for maximum life and edge retention.

When should you change disc blades on a John Deere drill or air-seeder?

Cutting edge yields require a sharp disc blade. A disc which starts and remains sharp (as illustrated right) is essential to cleanly cut through heavy, tough residue, especially on hard, dry soils. To achieve these goals, we recommend that the disc blades are replaced once they reach 17” in diameter. Once they drop below this threshold, the bevel is lost and the disc gets proportionately wider, which results in poor residue cutting and inconsistent soil penetration. The only exception is when operating in rocky soils, where it’s possible that the blades can lose their sharp cutting edge before they reach the 17” threshold. In these examples we recommend replacing the blades once the sharp cutting edges are lost.

Always be sure to install the disc blades the correct way, as illustrated in the image to the right.
Needham Heavy Duty Seed Boot Springs For John Deere 50, 60 and 90 Series John Deere Air-Seeders And Drills.

The Problem.

- Factory seed boot springs work well when new, but over time they begin to lose their tension. If the boot is not held tight against the disc, soil and residue can enter that gap and cause disc opener plugging and reduced soil penetration.

- Factory seed boot springs corrode and fail, especially when used on drills and air-seeders that band fertilizer in the row.

- If your seed boots don’t “snap” firmly back against the disc after being pulled away, the springs should be replaced. If you have an air-seeder with wings that fold up, the springs should have enough tension to push the seed boots against the disc, even when the wings are raised.

The Solution.

- Our springs are slightly thicker and stronger, providing around 15% more spring force compared to the factory John Deere springs.

- Our springs are zinc coated to help prevent corrosion over time. This is especially important if using dry fertilizers which contain nitrogen or potash, because the dust from these materials often corrodes and leads to failure of the factory springs.

Heavy Duty Needham Ag Seed Boot Springs For John Deere 50, 60 and 90 series box drills and air-seeders:

$6.00 each + shipping

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
Needham Closing And Firming Wheel Arm Bushing Kits For John Deere Drills and Air-Seeders.

Key Benefits

- Our closing and firming wheel arm pins are made from high quality heat treated steel, with the highest hardness value (+/- 60, measured on the Rockwell C scale) of all the factory and aftermarket pins we have tested. These pins are then precision ground for maximum smoothness and minimum friction.
- Our yellow poly bushings have been tested for 3 seasons on high acre per row openers in dusty conditions. We have found their life matches or exceeds factory closing wheel and firming wheel arm bushings without lubrication and no seizing up problems have been reported, unlike the steel bushings.
- Our yellow poly bushings don’t require greasing because they incorporate teflon, which acts as a lubricant to lower the friction around our smooth, precision ground closing and firming wheel arm pins.
- Our yellow poly bushings are much easier to install than factory and after-market steel bushings.
- We supply 2 x seals per row to keep dust and moisture out of the closing and firming pivot assembly.
- We supply a 1” ID washer to help remove the side to side play which is often present within openers with enough accumulated acres as the main opener casting wears against the closing or firming wheel arms.
- We supply a new grade 8 5/8” flange lock nut, as many existing lock nuts don’t have sufficient torque to hold the assembly tight, after the existing bolt has been torqued, re-torqued and removed.

The Problem.

Factory and aftermarket closing wheel arm and firming wheel arm pivot bushings are designed to be greased regularly to extend their life. However in dry, dusty conditions (such as the examples illustrated below), fine dust is often flung up into the closing and firming wheel arm pivots by the disc blades and gauge wheels, especially in dry, windy conditions. Abrasive dust mixes with the grease and causes the factory seals (on newer models) to erode, then dust enters the pivot assembly. This often causes them to lock up and for those of you planting into similar conditions, you understand the severity of this problem.

We learned early on that within dusty conditions (as illustrated above), its either necessary to grease the pivot points regularly (daily) to help purge the dust out, or not grease the pivots at all. The latter was further reinforced by the fact that the 60 series (and the later 50 series) openers were shipped from the factory without grease fittings on the closing and firming wheel pivot points. Without any grease, the seizing up problems discussed above disappeared, even on drills and air-seeders that operated in the most severe dry and dusty conditions. However, the service life of the pivot points was reduced without lubrication, even when using the newer John Deere oil impregnated powdered metal bushings, because fine dust enters the housing and dries out the small amount of lubricant they release. Based on many challenges, including those discussed above, we began looking for a closing and firming wheel arm pivot configuration that provided good service life, ideally without lubrication. We field tested many different combinations for at least 2 years within different operating conditions, especially across the dry, dusty conditions of the Central Plains and the dry regions South East Australia, before settling on the yellow poly outer bushings and precision ground pin.

Visit our website at www.needhamag.com, for additional information.
Closing and Firming Wheel Arm - Individual Parts Price Breakout

The parts listed above are available separately and are priced individually below.

Closing Wheel Arm Pin (1” OD x 3.37” - replaces JD part number N280648) ………….. $12.00 each
Firming Wheel Arm Pin (1” OD x 2.38” - replaces JD part number N284086) ……….. $12.00 each
1” ID Poly Bushing (replaces JD part number N219547) ……………………………………… $5.00 each
1” ID Triple Lip Seal (replaces JD part number A85727) ……………………………………… $2.50 each
5/8” Grade 8 Flange Lock Nut (replaces JD part number A169024) ……………………… $1.00 each
1” ID Grade 8 Washer (0.13” or 0.06” Wide, replaces JD part number A92849)………….. $1.00 each

Prices listed above do not include shipping.

Hardened Closing and Firming Wheel Arm Bushing (and Seal) Installation Tool

We offer this tool to help remove the old bushings and help install the new poly bushings and seals.

Closing and Firming Wheel Arm Bushing Kit Installation Tool (Hardened Steel)
$19.00 + Shipping 0.35 lb ea.

Free with all orders of 24 rows (or more) of our closing or firming wheel arm bushing repair kits.

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
**Key Benefits**

- Available for John Deere 50, 60 and 90 series openers.
- Our main opener arm pins and bushings have been field tested for over three years on drills and air-seeders planting large number of acres per row and we have found their service life matches or exceeds OEM pins and bushings.
- Our main opener arm pins are made from a very hard, heat treated material that's precision ground for very tight tolerance and consistency.
- Each pin features a chamfer on each end to aid with its installation. This is especially helpful when trying to install the pins with the openers still mounted to the drill or air-seeder. The OEM and most after market pins are almost flat on the ends and much more difficult to align during installation.
- Our main opener arm pins feature a socket to aid with their install and removal. OEM and aftermarket pins are smooth on the ends and are more difficult to drive out or install with a punch or air-hammer.
- Our hardened and heat treated outer bushings provide a very long service life and are easy to install with our install tool. The hardened install tool is made of tool steel and helps remove the old bushings and install the new ones without damage, plus helps align the second bushing with the first during installation.
- We also supply washers to help eliminate the side to side play in the opener mounting points. Both sides of the castings wear over time, so be sure to shim them as tight as possible with the washer provided.

**When to Replace the main opener arm pins and bushings.**

We suggest wiggling some of the openers side to side, paying particular attention to openers on the ends or within wheel tracks which generally wear the fastest. When measured at the rear of the disc blade, we suggest replacing the pins and bushings when the total side to side play reaches 1/2” (1/4” in either direction).

In most examples, the main opener arm pin and outer bushings will wear similar to what is illustrated in the image above right, so just turning the pins often doesn’t fix the play in a satisfactory manner. These very worn OEM pins and bushings produced about 1” of total side to side play (1/2” in either direction) measured at the rear of the disc blade. This much play had serious effects on seed placement, seed firming and seed slot closure because those wheels are no longer aligned with the seed slot. Growers will also see a rapid increase in the wear of the seed boot when the main opener arm pins and bushings wear significantly, because the disc runs at too small of an angle to create a seed slot wide enough for the seed boot to operate within. Therefore, we suggest replacing the main opener arm pins and bushings when you can measure 1/2” of total side to side play at the rear of the disc blades.

Some producers prefer to remove the opener from the 4x4” rock-shaft when replacing the main opener arm pins and bushings as illustrated right, plus if you have other parts to replace, its easier to do this with the openers removed. While the pins and bushings can be replaced with the openers still attached, the pins often have “wear steps” as illustrated in the image above right, making them more difficult to remove. Producers will appreciate the socket in the end of our main opener arm pins when it comes to removing them. This is because it’s difficult to use an air-hammer on the OEM and aftermarket pins with the ends being flat (and extended out above the cast housing) because its hard to hold the air hammer in place.
As the main opener arm pivots up and down millions of times, it slowly wears off both sides of the castings, especially on drills or air-seeders that do a lot of turning when seeding in odd shaped fields. We provide a new 0.16” thick washer* to help take up the side to side play to compensate for wear. Eliminating this side to side play helps increase the life of the main opener arm pin and outer bushings.

* Actual thickness of washer may vary with manufacturer or batch.

**Main Opener Arm Pivot Repair Kit** — includes everything needed for one row as shown above right.
One main opener arm pin, two outer bushings and one thrust washer.

**$54.00 per row + Shipping**

2.45 lb ea.

**Main Opener Arm Pins, Bushings and Thrust Washer - Individual Parts Price Breakout**

The parts listed above are available separately and are priced individually below.

Main Opener Arm Pin (1.25” OD x 5.50” - replaces JD part number N282536) ..................... $38.00 each
Main Opener Arm Bushings (1.25” ID x 1.63” OD - replaces JD part number N283636)............. $7.40 each
Thrust Washer (1.3” ID x 2.5” OD x 0.16” thick - replaces JD part number N216568).............  $2.00 each

**Main Opener Arm Installation Tool**

We offer this installation tool to help remove the old outer bushings, plus help align and install the new ones. It features a socket in the top of the tool to allow for the use of an air-hammer with a 1/2” punch. This makes removal of the old bushings and the installation of the new ones much easier.

One install tool is provided free with all orders of 24 rows (or more) of our main opener arm pivot repair kits.

**Heavy Duty Outer Bushing Removal and Installation Tool.**

**$25.00 + Shipping**

2.5 lb ea.
Needham Closing and Firming Wheel Arm Springs For John Deere Drills and Air-Seeders.

Key Benefits

We now offer high quality firming and closing wheel arm springs for all 50, 60 and 90 series drills and air-seeders.

The Problem

We often see and hear reports of the factory (and other aftermarket springs) working their way out of the pegs on the closing wheel arm, especially when the closing wheel arm bushings get worn. Our springs offer increased spring tension against the arm, to help ensure the spring remains engaged within the pegs as shown in the image to the right.

60 & 90 Series

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<th>LH</th>
<th>RH</th>
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<tr>
<td>FWSL</td>
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Firming Wheel Arm Springs

Closing Wheel Arm Springs

50 Series

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<td>FWSL</td>
<td>FWSR</td>
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On the 50 series, the same springs are used on the firming and closing wheel arms.

Our 50 series closing and firming wheel arm springs feature the same taller handle as the newer 60/90 series, to eliminate the need for the steel tube, when making adjustments.

All of our closing and firming wheel springs (itemized above) are competitively priced at $11.50 each plus shipping.

Visit our website at www.needhamag.com, for additional information.
Disc Opener Bearings For John Deere 50, 60 and 90 Series John Deere Air-Seeders And Drills.

Disc Opener Bearing for John Deere 60 and 90 Series (fits 1560, 1590, 1890, 1895, 1690 and 1990)

We offer individually packaged NTN bearings for the 60 & 90 series opener.

Disc Opener Bearing For 60 and 90 Series John Deere.

$39.95 each + shipping

Disc Opener Hub Bearing Rebuild Kit for John Deere 50 Series (fits 750, 752 and 1850).

This kit contains two Koyo or NTN (depending on availability) disc hub bearings (cup and race). The Koyo bearings are the same brand and type currently provided by John Deere in their 50 series hub repair kit, part number AA44267.

The kit also contains two ESP hub seals, the same brand and type offered by John Deere in their hub repair kit part number AA44267. Lastly, the kit contains two chrome plated wear rings, one oil resistant o-ring and one cotter pin.

Disc Opener Bearing Kit For 50 Series John Deere.

$25.00 each + shipping

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
Hub Seals For John Deere 60 and 90 Series Openers

**Large Hub Seal**
- Made by ESP (same brand as OEM)
- 1 Required per row
- Replaces John Deere Part # AN281241
- 3.67” OD
- 2.83” ID
- 0.31” Wide
- With Triple Lip Seals

![Large Hub Seal](image)

**Large Hub Seal For 60 and 90 Series John Deere Openers**

$6.50 each + shipping 0.10 lb ea

**Small Hub Seal**
- Made by ESP (same brand as OEM)
- 2 Required per row
- Replaces John Deere Part # B13294
- 2.36” OD
- 1.50” ID
- 0.27” Wide

![Small Hub Seal](image)

**Small Hub Seal For 60 and 90 Series John Deere Openers**

$3.50 each + shipping 0.05 lb ea

Visit our website at www.needhamag.com, for additional information.
Needham 50 Series Firming Wheel Arm Upgrade For John Deere 750 Drills (after serial number 3834) and all 1850 Air-Seeders.

See our John Deere 50 Series Firming Wheel Arm video on YouTube. Type "Needham Ag John Deere 50 Series Firming Wheel Arm" or scan the QR code to the right.

### The Problem

The factory John Deere 750 series box drills (after serial number 3834) and all 1850 air-seeders have a welded pin on the firming wheel arm as illustrated below. This pin wears over time and results in excess side to side travel on the firming wheel arm. The arm is also held in place with a roll-pin, which makes it difficult to shim with spacer washers to keep it tight.

### The Solution

We have an arm upgrade kit, which includes a replaceable firming wheel arm bushing (just like on the 60/90 series firming wheel arms) and this kit comes with all the hardware to install them on one row.

### Needham 50 Series Firming Wheel Arm Upgrade Kit

(all parts shown above are supplied for each row)

$50.00 per row + Shipping 5.8 lb ea.

### Firming Wheel Arm Upgrade - Individual Parts Price Breakout

The parts listed above are available separately and are priced individually below.

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Series Firming Wheel Arm</td>
<td>$25.00 each</td>
</tr>
<tr>
<td>Firming Wheel Arm Bushing (1&quot; OD x 2.70&quot;)</td>
<td>$12.00 each</td>
</tr>
<tr>
<td>1&quot; ID Poly Bushing (replaces JD part number N219547)</td>
<td>$5.00 each</td>
</tr>
<tr>
<td>1&quot; ID Triple Lip Seal (replaces JD part number A85727)</td>
<td>$2.50 each</td>
</tr>
<tr>
<td>5/8&quot; Grade 8 Flange Lock Nut (replaces JD part number A169024)</td>
<td>$1.00 each</td>
</tr>
<tr>
<td>5/8&quot; x 4 1/4&quot; Grade 8 Flange Bolt</td>
<td>$2.00 each</td>
</tr>
<tr>
<td>1&quot; ID Grade 8 Washer (0.10” Wide, replaces JD part number A92849)</td>
<td>$1.00 each</td>
</tr>
</tbody>
</table>

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
The Problem

We regularly hear from growers who plant large areas with John Deere drills or air-seeders, who tell us their gauge wheel axles have seized up and can't be adjusted (as illustrated right). This is most common in low rainfall regions where a cloud of dust often surrounds the seeder during most of the planting season and it is especially common on drills and air-seeders that don’t have adequate down pressure or ballast (or a combination of the two). Without adequate down pressure or ballast, the gauge wheel doesn’t remain in constant contact with the soil surface. This loss of target seeding depth causes the handle to constantly rattle within the depth adjusting cover as shown in image “A” below. Not only does this reduce crop emergence as a result of shallow placed seeds or seeds on top of the ground, it also causes the gauge wheel axle to constantly pivot back and forth. The constant movement wears out the O ring as shown below in image “B”.

Once this O ring deteriorates as shown above, it lets dust into the assembly, causing it to seize up. Some clay based greases actually made this locking up problem worse, as the dust mixes with the grease to cause “cake-lock failure” where the gauge wheel arm seizes solid. When the gauge wheel arm can’t be moved with a large crescent wrench, hooked to where the gauge wheel mounts, the only way to free them up is to push the gauge wheel arms out of the assembly with a press as shown in image “C” above right.

Needham Gauge Wheel Axle — Key Benefits

- Heavy duty assembly replaces John Deere part numbers N282117, AA92485 and AA73951, which fit all 60 and 90 series John Deere openers.
- Dust cap is welded all around, rather than spot welded around parts of the OEM versions. This helps keep dust and moisture from entering the inside of the dust cap.
- Maintains the OEM milled area on the outside of the axle to help with lubrication along the axle.
- Includes grease zerk.
- Yellow zinc coated to minimize corrosion over time.
- Allows around 1/8” of additional adjustment of the gauge wheel towards the disc, to help keep mud out.

Needham Gauge Wheel Axle

$45.00 + Shipping

Visit our website at www.needhamag.com, for additional information.
Needham Spindle Assembly With Triple Lip Seal — Key Benefits

- Heavy duty assembly replaces John Deere part numbers AN282118 (RH) and AN282119 (LH) on John Deere 60 and 90 series openers.
- Each spindle comes complete with high quality triple lip seal to help keep dust out of the assembly over time.
- Hex head allows easy installation.

Needham RH and LH Spindle Assembly With Triple Lip Seal

$40.00 + Shipping

0.85 lb ea.

The Problem

As acres accumulate on John Deere drills and air-seeders the Cast Depth Arm, John Deere Part number AN282108 (RH) and AN282109 (LH), wear within the jaws as illustrated right. This wear allows the gauge wheel to move up and down and change seeding depth. It also accelerates wear within the depth adjust cover as shown on the previous page.

The Solution

Needham Ag Technologies is proud to introduce a new Depth Arm. Its fabricated out of high quality steel and its much heavier duty than the factory cast version.

Needham Depth Arm — Key Benefits

- Our single Depth Arm can be used on the RH and LH side, so one part replaces the John Deere part numbers (RH) AN282108 and (LH) AN282109 which install on John Deere 60 and 90 series openers.
- Heavy duty steel construction for longer life.
- Works with OEM gauge wheel axle and depth adjust cover.

Needham Depth Arm

$85.00 + Shipping

2.3 lb ea.

Grade 8 Nut & Bolt (for jaw)

$1.00 per row + Shipping
Important Elements of The Case-IH 500/500T & New Holland 2080/2085

**Parallel Linkage**

The Case-IH 500 and New Holland 2080/2085 features a parallel linkage which offers a range of just over 20” of opener operation. This is a huge benefit, especially on rolling soils, because the opener can follow the terrain much better than a radial arm design currently used. For example by John Deere on their 1890/1895. A parallel linkage also allows the closing wheel to run at a more consistent pressure, compared to the 1890/1895 which increases down pressure as the 4x4” rockshaft is rotated backwards.

If your planning to buy one of these air-seeders, be aware they can be ordered without gauge wheels and without closing wheels, allowing you to add wheels more suitable for no-till.

**Spring Spacers**

The SDX 30 and 40 (the Case-IH single disc seeder which was replaced by the Case-IH 500) had an excellent feature which allowed the down pressure to be adjusted on a row by row basis. This was particularly beneficial behind tractor and/or tow between air-cart wheel tracks, as these wheel tracks were lower and more compacted, requiring more down pressure to penetrate. To bring this feature back, we offer spring spacers which can be added to the wheel tracks. One is needed per row and more information is available on page 43.

**Disc Blade**

The disc must be sharp to consistently cut through heavy, tough residue and hard soils.

For best results, they should be replaced when the sharp cutting edge becomes dull or when the disc wears below 17” in diameter, whichever comes first.

See the following page for more information on our disc blades for the Case-IH 500 and New Holland 2080/2085.

**Narrow Gauge Wheel**

When the down pressure is adjusted correctly, the gauge wheel should remain in constant contact with the soil surface. Ideally, the gauge wheel can be turned with firm force when the seeder is stopped in the ground, but be aware that as and New Holland sir-seeders are pulled forward, some weight is transferred from the rear of the frame to the front. Narrow gauge wheels are preferred in no-till conditions because they maintain depth more consistently, especially within heavy residue. Narrow gauge wheels also leave more residue standing which helps conserve moisture in dry climates. For more information, see pages 13 - 16.

**Closing Wheels**

The factory closing wheels perform well in conventional soils with loose soil on top, but they really struggle to close the slot within higher moisture no-till conditions, especially when seeding deeper (when the width of the seed slot becomes wider). We have 2 different closing wheel options available, the 20 Point Wheel and the 2 x 13” closing wheel. When used with our Angle-Changer, they will close the seed slot much better than the factory closing system, plus they use far less closing wheel down-pressure, which transfers more down-force to the disc for cutting soil and residue. See pages 41 - 42 for more information.

**Seed Brake**

Seed bounce is a common problem for many air-seeders, and its most likely to occur within the following examples:

1. When planting lighter seeds (such as canola, or cover crops with small seeds).
2. When placing fertilizer either with the seed in the row, or within mid-row bands because it requires higher fan speeds.
3. When using wider seeding equipment, again because they require higher fan speeds.

A combination of these examples further increase the risk of seeds being blown out of the seed slot. The seed brake allows most of the air to evacuate through the housing, allowing seeds to fall to the ground by gravity. More information on seed brakes is contained on the following page.
Spring Spacers For Case-IH 500/500T & New Holland 2080/2085

The 1 1/4” seed brakes install easily on the Case-IH 500/500T and New Holland 2080/2085 air-seeders. The seed hose is removed from the top of the seed tube on the opener by releasing the hose clamp. The seed brake is then attached to the top of the seed tube with a hose clamp (supplied), then the seed hose is pushed 1 1/2” into the top of the seed brake and held in position with a 2nd hose clamp (supplied). The seed brake is curved as illustrated right, this allows the seed hoses to be routed around frame members. More detailed information on the seed brakes is contained on pages 21—22.

1 1/4” Seed Brake For Case-IH 500 and New Holland 2080/2085, with hose clamps.

$27.95 each + shipping

18” Disc Blades For Case-IH 500/500T & New Holland 2080/2085

Key Benefits:

- Our 18” discs will install on Case-IH 500/500T and New Holland 2080/2085.
- Heat treated boron steel blades are designed to cut cleanly, to help provide consistent seeding depths and long life.
- Blades measure 18” in diameter, 5mm (0.197”) in thickness and have a Rockwell C hardness of +/- 50 for maximum strength and durability.
- Our disc blades are designed to self sharpen on most soils to maintain a sharp cutting edge.

When to Replace:

We recommend replacing the disc blades when the diameter reaches 17” or when the cutting edge becomes dull (whichever occurs first). Running the Case IH 500 or New Holland 2080/2085 blades less than around 17” has often resulted in plugging of the scraper/boot in tough residue conditions.

18” Disc blades for Case-IH 500 and New Holland 2080/2085.

$30.00 each + shipping 13 lb ea.
While we really like the Case-IH 500/500T & New Holland 2080/2085 air-seeders, many growers are reporting that they really struggle to close the seed slot, especially in higher moisture and residue covered no-till soils. The principal weakness in the factory closing system is the closing wheel, which runs too straight. Without gathering action to pull the seed slot closed from the side, the closing wheel only presses down from the top. This requires high amounts of down-pressure, which reduces down force on the disc which is important for soil and residue cutting. High amounts of down-pressure above the seed often results in soil compaction which slows or reduces the % emergence.

Our new Angle-Changer is a specially designed coupler which mounts around the factory closing wheel arm tube and increases the gathering action of the closing system.

As the Angle Changer is rotated, it changes the angle of the closing wheel. Once growers find the angle that performs best in their soils and moisture conditions, they lock it in place with the set-screw and no more adjustments are required.

Based on our field experience, we know about where the Angle-Changer needs to be set for most regions and these come with instructions.

**LIGHTER SPRING**

During field testing over the last five years, we have found the factory 4 x 12” closing wheels use a very stiff spring to crush the seed slot closed. When we increase the closing wheel gathering action with our Angle-Changer and add closing wheels which are more suitable for damp no-till soils, we have found that far less down pressure is required to close the seed slot. This transfers more weight to the disc opener to help cut through tough residue and hard soil. To reduce the down-pressure and help provide a greater range of adjustment, we offer a lighter duty spring.
2 x New Closing Wheel Options

Based on our field testing over three years across most regions of the US and Canada, we have found two different closing wheels that perform better than the factory 4x12” wheels, when used in combination with our Angle-Changer. These closing wheels include the Needham 2x13” Wheel and the Martin 20 Point Crumbler Wheel (both shown below).

Needham Ag 2 x 13” Wheels

The Needham Ag 2x13” Wheels with Angle Changer are designed for growers who plant mostly into moist conventional soils, minimum till or no-till conditions with some loose soil on top. While these wheels aren't as aggressive as the Martin 20 Point Crambler Wheel, they perform much better than the factory closing system across a wide range of field conditions, with much less closing wheel arm pressure. (Angle Changer required).

Martin 20 Point Crumbler Wheels

The Martin 20 Point Crumbler Wheels, with Angle-Changer are more aggressive than the factory closing wheels and the Needham Ag 2x13” wheels. They perform best in tough, residue covered no-till conditions, including damp clay soils, because they reach down through the residue better to close the seed slot. They also perform much better in the wheel tracks, where the standard rubber tires often aren't aggressive enough to close the seed slot.

Light Duty Spring

Our light duty spring is recommended when adding the Martin 20 point crumbler wheels, especially in looser soils. Lighter springs are required because the factory spring provides too much down pressure, even when set to the lowest position with the spring touching the tube.

Angle Changer (One per row required with the 2x13” Wheel & Martin 20 Point Crumbler Wheel)

$65.00 each + shipping 1.4 lb ea.

Needham Ag 2x13” Wheel

$60.00 each + shipping 8.8 lb ea.

Martin 20 Point Crumbler Wheel

$120.00 each + shipping 16 lb ea.

Lighter Duty Spring (right and left available)

$12.00 each + shipping 0.8 lb ea.

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
The Problem

The older Case-IH SDX 30 & 40 Air-Seeders had a very good feature which was unfortunately not continued on the new 500/500T or 2080/2085 series. This feature was the ability to adjust down-pressure individually on each opener. This was accomplished by simply pulling a pin and selecting one of the 3 hole positions (as illustrated right). This feature was most beneficial when trying to seed the same depth into tractor or air-cart wheel tracks. This is much more difficult than it seems, because wheel tracks are often lower and the soil is more compacted. Therefore, the openers in these tracks require more down-pressure than all the other openers on the same frame section. Depending on the tire configuration and row spacing, around 8-12 openers were often set in the maximum down pressure setting while all the others across the seeder were set in the medium position.

Many growers using the 500/500T and 2080/2085 have reported that they have struggled to achieve acceptable soil penetration and consistent seeding depth behind tractor and air-cart tracks, especially in softer soils with bigger tire depressions. Just like the SDX, these openers need extra down pressure.

The Solution

Spring spacers are 1/2” thick and install easily between the spring and the cast housing as shown in the image below right. The spring spacers match the profile of the housing and the spring, providing an additional 80-100 lb. of down pressure per row.

Installation is achieved by supporting the opener with a floor jack, then unscrewing the bolt which holds the spring assembly together. Once the bolt is removed, the spring spacer can be inserted between the housing and the spring. Once installed, tighten the locking bolt back up.

One spring spacer is required per row, behind tractor and tow-between air cart tires.
Narrow Gauge Wheels
For Case-IH 500/500T & New Holland 2080/2085

The same 2 3/4” narrow gauge wheels illustrated in greater detail on pages 11-12 are also available for the Case-IH 500/500T and New Holland 2080/2085. These narrow gauge wheels are specially designed for heavy residue no-till conditions, especially when planting into corn residue, as shown above. The narrower tires avoid almost half of the standing residue, (compared to 4 1/2” standard tires) and they help control seeding depth more accurately. The Case-IH 500/500T and New Holland 2080/2085 can all be ordered new without gauge wheels and without closing wheels, so if you plan to no-till, both of these products will help improve seeding depth consistency and slot closure.

Our highly durable gauge wheels come assembled with two steel wheel halves, heavy duty urethane tire and long life 5203 bearing. We also offer a warranty against tears and significant stubble damage to the OD of the tire for a period of 3 years after date of purchase.

Screen For Case-IH 500T and New Holland 2085
$495.00 each + shipping

We now have a screen for the hopper of the Case-IH 500T and New Holland 2085. Without a screen, some growers reported small pieces of paper, rocks and other foreign material can get into the metering rollers and break the teeth off. The foreign material can also block seed tubes or seed boots, causing skips.

To help eliminate this problem, our heavy duty expanded metal screen inserts into the hopper of all the 500T and 2085 series air-seeders. The screen allows the lid to close and latch using existing rubber latches.

Please note that when using this screen with crops such as treated soybean (which flow slower), you may not be able to fill the hopper at a capacity greater than around 20 bushels per minute, to give the seed time to pass through the screen.
**Important Elements Of Most Corn Planters**

**Row Cleaners**

A well designed and adjusted row cleaner should be heavy enough to part residue and lightly till the seed zone without trenching. Aluminum side treader wheels control tooth engagement depth in addition to providing traction to keep the wheels turning in tough conditions.

The row cleaners pictured below can be seen parting residue in addition to lightly tilling the seed zone and leveling a set of tractor or combine wheel tracks. For more information on row cleaners, please see pages 47—48.

**RID Tires**

RID tires (illustrated on page 52) are designed to fit most no-till planter gauge wheels and their purpose is two fold:

1) RID tires allow the sidewalls of the seed slot to flex upwards. Without RID tires, the soil is compressed up against the standard gauge wheel tires, causing sidewall compaction which can reduce root growth.
2) RID tires leave a band of uncompressed soil on either side of the seed slot which significantly helps improve closing action of most closing systems.

**Spading Closing Wheels**

There are many different closing wheels available on the market and most work great in dry tilled ground. However, few perform as expected in moist no-till conditions. We offer two different spading wheel options for these tough conditions, these include:

1) A single 15” spading wheel alongside a standard 12” smooth wheel
2) A pair of 13” wheels (illustrated above).

Spading wheels close the seed slot from the bottom up, by engaging the soil and pressing soil around the seed with diamond profile teeth to provide seed to soil contact. They use minimal down-pressure to close the seed slot, so sidewall compaction is almost eliminated. For more information on these wheels, see pages 49 - 50.

**Drag Chains**

The drag chain is a simple addition to a planter to improve the uniformity of the surface of the seed slot. They also help provide uniform soil warming and even crop emergence. The drag chain is designed to pull a hand full of soil behind the closing system as illustrated above to level the seed zone and fill in any openings in the seed slot. It's important to close the seed slot consistently, especially when planting corn to prevent seeds leafing out underground. For more information on drag chains, please turn to page 51.

**Keeton Seed Firmers**

Seed firmers are an important addition to a planter, especially when running spiked or spoked closing wheels. In true no-till conditions we recommend 6 pounds of pressure on the Keeton tail; in tilled soils we recommend 2 pounds. A standard tail Keeton seed firmer is maxed at around 2 pounds, so for extra down-pressure (measured with a digital scale) consider adding Mojo Wires from Exapta Solutions. These offer 3-5 times the down-force that the stock Keeton firmer applies (Mojo Wires are not recommended for low-profile Keeton seed firmers).
Key Benefits:

- Compact enough to fit within the WA-1360 row floating row cleaner.
- The Martin UMO-100 is mounted close to the double-disc openers to ensure consistent separation and minimize fertilizer injury, especially during turns or when working on side slopes.
- Places liquid fertilizer 1, 2 or 3" to the side of the center of the row, with 3 vertical settings which consist of $\frac{3}{4}$" above seed depth, at seed depth and $\frac{3}{4}$" below seed depth.
- 14" diameter heavy duty 5 mm thick disc blade.
- Double tapered bearing hub.
- Fits most planters without a no-till coulter.

The Martin UMO-100 fertilizer opener places fertilizer cleanly below the soil surface in a band to maximize uptake and minimize volatility losses.

The Martin UMO-100 fertilizer opener is most beneficial when planting corn, especially within continuous corn or no-till environments. Once the residue has been consistently cleared with a row cleaner, the Martin UMO-100 fertilizer opener can position liquid nitrogen alongside the row to provide supplemental nitrogen, or a blend of liquid nitrogen and a product such as 10-34-0.

Placing such nutrients in a consistent band alongside the row increases nitrogen recovery and helps increase early plant health, which frequently results in higher yields compared to surface applied dry or liquid, or pre-applied anhydrous ammonia applications.

Martin UMO-100 Fertilizer Opener

For Kinze, 7000-1700 series John Deere and White 6000 and 8000 series planters.

$395.00 per row + shipping.

For stand-alone fertilizer opener (no row cleaner) installation, a mounting bracket is required.

Mounting bracket $36.50 per row + shipping
Key Benefits:

- Floating row cleaners follow the contours of the soil surface, clearing residue consistently to provide a cleaned strip.
- Cleaned strips warm uniformly, helping to create uniform emergence.
- Farm Journal research has found that floating row cleaners significantly increase corn yields, when compared to fixed design row cleaners.
- Can be equipped (strongly recommended) with aluminum side treader wheels, which limit the tooth engagement of the row cleaner wheels.
- Mounting brackets available for most planter brands and configurations.
- Can be raised up when going from no-till to conventional seedbeds.

Floating vs. Fixed Row Cleaners?

Farm Journal Field Agronomist Ken Ferrie stated in a February 2007 Farm Journal “For the third year, running row cleaners so they can float over the terrain improved yields compared to the same row cleaners pinned into a static position. In 2006, floating row cleaners added 10 bu. to 13 bu. to yield in no-till fields. After closely watching these row cleaners run and monitoring yields for the last three years, I’m convinced that it’s best to let row cleaners [with depth bands] float and hug the ground in no-till fields”.

Martin WA 1360 Floating Row Cleaners (complete with aluminum side treader wheels, scrapers and mounting brackets).

For Kinze and 7000-1700 series John Deere $522.00 per row + shipping.

Row cleaners are available for other brands, please contact us for more information and pricing.

Specific information will be required when ordering, for example: is a no-till coulter installed?
Row Cleaner Options For Heavy Residue

We have lots of growers successfully planting double crop soybeans after 100+ bu/ac average field wheat yields. Planting into these high residue volumes, especially right after wheat harvest may require a couple of row cleaner modifications to help achieve the best soybean stands.

1) **Wheel Weights.**

A pair of wheel weights add a total of 8 lb. of weight to the front of the row cleaner, to keep the wheels engaged in heavy residue and to maintain traction with the aluminum side treader wheels. These weights are made to nest inside the aluminum side treader wheel as illustrated in the image to the right.

**Martin Wheel Weights For Floating Row Cleaners** (complete with longer mounting bolts)

For 3 or 4 bolt row cleaner wheels (please specify)

$42.00 per row + shipping.

2) **Martin Razor Wheels.**

The new Martin Razor Wheels cut through tough crop residue and cover crops with ease.

Heavy crop residue and cover crops can turn any planter into a tangled mess. That’s why it makes sense to add Martin-Till Razor Wheels in these conditions.

Whether you go with a tandem offset or dual intersecting configuration, these rugged, razor-sharp wheels slice and dice the toughest residue and cover crops to keep you rolling at top speed, day in and day out.

Right and left wheels are available, and like all Martin products, the new Razor Wheels come with an ironclad one-year warranty.

**Martin Razor Wheels**

$57.50 per wheel + shipping.
Key Benefits:

- Martin spiked closing wheels press the seed slot closed at seed depth. This principal leaves loose soil above the seed, which has been found to accelerate emergence, especially in cool soils.
- Martin spiked closing wheels work very well in higher moisture soils, which cannot be adequately closed using a conventional pair of rubber tires.
- Most of the sidewall compaction created with the disc openers and gauge wheels (mainly within wet soils) is segmented with a spiked closing system.
- Martin spiked closing wheels are shipped with a heavy duty HU44-B2 hub and 5/8" bolt to mount them to the closing wheel assembly. This hub utilizes a 5203 double-row bearing which provides a long service life.
- The Martin drag chain is recommended to pull behind the closing system. The drag chain levels the seed zone and helps with uniform soil warming and consistent crop emergence.

Pictured above is a pair of 13” spiked closing wheels and drag chain, the ideal combination to effectively close the slot in higher moisture conditions. The closing wheel arm assembly needs to operate as level as possible (an optional drop-down kit is available to lower the closing wheels by 1” and maintain a level arm).

The images to the left illustrate two different closing systems on the same planter within the same pass. Notice how the pair of factory smooth rubber tires are not closing the seed slot. Down pressure was increased following the photo being taken, but closing effect was not significantly improved. The increased down force resulted in more sidewall compaction on either side of the seed slot, which we expected would slow emergence.

The right photo illustrates a 15” spiked closing wheel alongside a single 12” factory closing wheel. This combination provides adequate slot closing, together with depth control from the smooth closing wheel positioned on the opposite side of the closing wheel arm.

Notice how the no-till coulter threw out soil on either side of the seed slot in both images. Be aware that in many soils, a no-till coulter can hurt more than it helps.

Martin 13” spiked closing wheels (pair) for bolt on style hubs on John Deere, Kinze and MF/White:

$240.00 + shipping.

Martin 15” spiked closing wheel (single) for bolt on style hubs on John Deere, Kinze, and MF/White:

$130.00 + shipping.

Closing systems for planter types or models not discussed above may be available, please call for more information.
SCW899 Closing System For Case-IH Planters

Key Benefits:

- A pair of 9” spiked wheels replace the pair of factory closing discs to improve closing action, especially on higher moisture no-till soils.
- The combination of offset double disc openers, RID gauge wheels, SCW899 closing wheels and the rear rubber tire works as well (or better) than any planter opener on the market.
- The closing wheels come assembled, complete with hubs and bearings ready to bolt on.
- Available for Case-IH 800, 900, 1200 and 1250 planters.

The pair of SCW899 guarantee a closed seed trench in most conditions and the following factory smooth wheel gently tamps the surface to help provide seed to soil contact and rapid emergence.

Moist soil is moved toward the seed at seeding depth even in wet, hard or sod conditions. In wet conditions, the soil is prevented from forming a continuous ribbon by the lifting action of the teeth as they rotate up out of the soil.

Other benefits include:

- Seed trench is closed, even in high moisture conditions
- Seeding depth does not have to be raised to insure emergence
- Soil above the seed is loose allowing quicker emergence in a compaction free environment
- Sidewall compaction is almost eliminated

Pair (one row) of SCW899 closing wheels for Case-IH planter $130.00 + shipping.

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
Martin Twisted Link Drag Chains For John Deere and Kinze Planters.

Key Benefits:

- Heavy square link chain helps eliminate twisting.
- Drag chains easily mount to all John Deere Max Emerge units, using the $\frac{5}{8}$" mounting bolt.
- Fits Kinze and MF/White closing wheel arms with $\frac{5}{8}$" mounting bolts.
- Older style Kinze and John Deere closing wheel arms with roll-pin wheel mounts may need holes drilling in the closing wheel arm for installation.
- Comes with all mounting hardware.
- Zinc coated chain helps minimize corrosion over time.

Following behind Spading Closing Wheels, the Martin Twisted Link Drag Chain attachment helps to level the seed zone by pulling a handful of soil along. This technique drops loose soil into any areas not completely closed, helping eliminate corn leafing out underground.

Martin Twisted Link Drag Chains help even out the rate of drying and insures the soil does not dry past seed depth. This is a low cost, low maintenance way to help increase uniform emergence in the drier parts of the field and is a must when using the spading closing wheels in minimum till. By the way, some of our customers still feel the need for some shallow tillage in the spring and the spading closing wheels and Martin Twisted Link Drag Chain combination do an excellent job in that situation.

Pictured above is the Martin Twisted Link Drag Chain assembly behind a pair of 13” spiked closing wheels. Notice how the closing wheels create enough loose soil to allow the Martin Twisted Link Drag Chain Assembly to pull a handful of soil along, and drop soil into any areas of the seed slot not properly closed.

The closing wheel arm pictured above is fitted with the optional Martin Drop-Down kit. This kit lowers the attachment point of the two $\frac{5}{8}$” bolts (which mount the HU44-B2 hubs to the arm). Leveling the closing wheel arm assembly is very important to ensure optimum closing system performance.

Martin Twisted Link Drag Chain Assembly for John Deere or Kinze

$38.00 each + shipping.
Martin Reduced Inner Diameter Gauge Wheel Tires For Planters.

Key Benefits.

- Reduced Inner Diameter Gauge Wheel Tires are an important addition to a no-till planting system, especially when the soils are high moisture.
- The benefits of reduced inner diameter gauge wheel tires can be seen in the images to the right where both a standard gauge wheel tire and a reduced inner diameter tire are both installed on the same row unit. Notice how the standard tire (left) compressed the sidewall, increasing the risk of sidewall compaction and reduced yields. The reduced inner diameter gauge wheel tire (right) allows the sidewall to slightly flex upwards, reducing soil compression next to the seed slot, reducing the risk of sidewall compaction.
- Another significant benefit of the reduced inner diameter gauge wheel tires is their ability to leave the soil either side of the seed slot looser, this helps improve the closing action of both factory and Martin-Till closing systems.
- RID-01 will not fit John Deere XP series row units unless you purchase a new John Deere wheel half (part number A56621).

Many different reduced inner diameter gauge wheel tires are available on the market. Our research has found the most effective tire is one which includes a softer, more flexible compound. Softer compounds enable tires to better shed wet soil, plus they offer greater terrain following ability by absorbing more shock and vibration. Our tire is the one illustrated at the top of the two tires (with a weight of 7.4lb). Other tires on the market have a harder and less flexible compound and they can be best identified by their increased weight.

Sidewall compaction is still a yield limiting factor for many corn fields, especially those planted in high moisture conditions.

Martin 16” x 4 1/2” reduced inner diameter gauge wheel tires, to fit MF/White, Kinze or John Deere gauge wheels (up to, but not including 1700 series).

$26.75 each + shipping.

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
Needham Ag Row Cleaner Wheels For Yetter Row Cleaners

Key Benefits.

- **Thicker Material.** The Needham Ag 14 finger wheels measure $\frac{5}{16}$” in thickness (compared to the $\frac{1}{4}$” thickness of the OEM 16 finger wheels).
- **Long Life and Excellent Durability.** While our new wheels are the same diameter as OEM wheels, they will extend service life significantly. Our new wheels are made from heat treated, T-1 material (military armor grade steel) which almost eliminates the finger breaking and bending problems reported by some Yetter row cleaner owners, plus they are priced very competitively.
- **Move Less Soil.** Our new 14 finger wheels have been found to move less soil than the OEM 16 finger version and especially less soil compared to the shark tooth wheels. This is very important when working in rolling terrain to prevent trenching and erosion down the slopes.
- **Built by Martin.** The new 14 finger wheels are manufactured to Needham Ag Technologies, LLC. Specifications, by Martin Industries.
- **Easy Installation.** The 14 finger wheels allow simple installation on all Yetter hubs with dust-cap mounted grease fittings.

Row Cleaner Wheels To Install On Yetter Row Cleaners.

$50.00 each + shipping.

1 x 12” Closing Wheels

Key Benefits.

- **Assembled.** 1 x 12” Closing Wheels come assembled with 1” wide rubber tire and bearing, ready to bolt on most newer model planters, drills and air-seeders which use a 5/8” or 16mm mounting bolt.
- **Quality bearing.** Comes with a high quality 5203 bearing for long service life.
- **Fits most planters.** Replaces planter closing wheels, including John Deere part number AA39968 and Kinze part number GA6434. Also fits Great Plains double closing wheel systems on drills, part number 814-174C and closing systems on Case-IH SDX30 and 40 air-seeders, part number 87695406.

1 x 12” Closing Wheel Assemblies

$35.00 each + shipping.

Visit our website at www.needhamag.com, for additional information.
Tramline Kits

Key Benefits:

- Tramlines are a method of applying inputs with high levels of accuracy.
- They avoid driving over a seeded crop.
- Seed is diverted to one (or both sides) of the tramline. This doubles the plant population either side of the wheel-tracks (assuming you purchase 2 motors per tramline), which allows you to drive through the growing crop with a minimal yield loss.
- Tramlines are especially beneficial in tall crops later in the season, because they allow sprayers to make applications with minimal crop damage.
- Tramline kits are available for most air-seeders/box drill and sprayer combinations.

When tramlining, seed is placed in the row (or rows) alongside the tramline tracks by using electric tramline motor assemblies (pictured above). Tramline assemblies are installed within the seed tubes and are available for both box drills and air-seeders.

Placement of the tramlines across the field is managed by the control box (pictured above). A proximity switch on the drill/air-seeder is used to advance the tramline sequence to coincide with the width of the sprayer. The control box tells the operator when the drill/air seeder is tramlining and alerts the operator of any problems.

Amity Tramline kits for even multiple drill/sprayer width combinations (such as a 30’ drill and 60’ boom or 30’ drill and 90’ boom)

$2400.00 + shipping

Amity Tramline kits for non-even multiple drill/sprayer width combinations (such as a 24’ drill and a 60’ boom, or a 30’ drill and a 75’ boom)

$3500.00 + shipping

Please call or email us for a more detailed information package on tramlines.

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
Needham Ag Seed Tubes For Box Drills

The Problem.

Most seed tubes on the market drop seeds evenly if the tubes remain almost vertical in operation. However, as you drive up or down slopes, especially when seeding lighter seeds such as radish or grass seeds, seeds often hang in the corrugations of the seed tubes. Often these seeds fall out in clumps when the seed tube straightens back out or when enough vibration shakes the seeds loose, resulting in inconsistent seed placement down the rows.

Some drills (as illustrated right) don’t start out with vertical seed tubes, even when new, so this presents greater problems.

The Solution

We have been able to source a new design of rubber seed tube to help improve seed flow, especially when seeding smaller seeds or when seeding on rolling ground (or both). These new seed tubes are made from natural rubber and provide excellent flexibility. They also incorporate internal folds above each corrugation, so as the seed tube stretches out, the folds direct the seeds away from the corrugations and help eliminate any seeds being held in the seed tube.

These seed tubes also incorporate a small amount of peroxide into their formulation, this has been found to be a safe and effective way of deterring rodents from damaging the seed tubes.

When installing these seed tubes, be sure to install them the correct way up.

We have found these seed tubes fit most drills available on the market and the chart to the right illustrates which ones install on specific brands and models. Seed tube dimensions are provided for brands or models not included.

For more information on how these seed tubes work better than others on the market. Search for “Needham Ag Seed Tubes” at youtube.com or scan the QR code below.

I installed your seed tubes on my John Deere 750 and they really made a difference to my seed distribution. Duane Weaver, Southern Illinois.
| Tube Part Number: NA-S | Dimensions: 8-20” Operating Range, with 1 1/4” ID Coupler at both ends | Installs On: John Deere Single Disc No-Till Drills. - Including 750, 1560 and 1590 John Deere Double Disc Drills - Including 8200, 8250, 8300, 8350, 8500 and 450 (please check the hose dimensions above, as some 8000 series drills are slightly different and require the NA-M hose below). |
| Tube Part Number: NA-M | Dimensions: 12-26” Operating Range, with 1 1/4” ID Coupler at both ends | Installs On: Great Plains - All late model double disc drills (early models had a seed tube with a long non corrugated area at one end). No-till drills with parallel linkage require the seed tube NA-L shown below. Sunflower - 9300, 9400, 9500 and 9600 Series. Landoll - 5210, 5211. 5530 and 5531 Tye - All double disc drills UFT - Conventional and 5000 Series No-Till Drills Best - All No-Till Drills. Frontier - BD 1307 John Deere Double Disc Drills - Including 515 and 520 |
| Tube Part Number: NA-L | Dimensions: 15-36” Operating Range, with 1 1/4” ID Coupler at both ends | Installs On: Great Plains - All No-Till drills with parallel linkage (including the 10 series) and all HD Series openers, including 2N-2410, 2N-3010, 3S-4010, 3S-3000HD, 3S-4000HD. Consistent with all seed tubes on drills which are stored for extended periods with openers in the lowered position, release the bottom of the seed tube or lower the drill to avoid hose stretch. Haybuster - 77, 77C, 107, 107C, 147 and 1575 John Deere Double Disc Drills - Including 455 John Deere Single Disc Drill Fertilizer Box - Including 1590 |

Seed Tube NA-S  $11.00, plus shipping 0.3 lb ea.

Seed Tube NA-M  $12.00, plus shipping 0.5 lb ea.

Seed Tube NA-L  $13.00, plus shipping 0.75 lb ea.

Please compare your current drill seed tube length with our specifications below, to ensure they match. Some require hose clamps to secure them to seed cup.

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
**Well Sown = Half Grown!**

Throughout his extensive career in soil management and crop production, Phil Needham has never forgotten the phrase “well sown = half grown” he heard as a child from his grandfather, who was a 4th generation farmer. His phrase conveys the importance of placing good quality seeds into the soil at a uniform depth and spacing, to obtain uniform crop emergence. This helps create high yield potential from the start, to access light, moisture and nutrients. This uniform emergence also helps the crop grow through the season at consistent growth stages across the field, which helps with timing of crop inputs such as nitrogen and foliar fungicides, plus it helps achieve a consistent number of heads per square yard at harvest.

This phrase has helped Phil’s career of helping growers increase their wheat and other crop yields, using no-till to help them boost profits.

One of the biggest contributions to wheat yields and profits within North America came from the uniform delivery of liquid nitrogen using stream bars. Prior to this, growers often used spinning disc spreaders to try and spread light products like urea. Without frequent pattern testing streaked fields and lower yields often resulted, especially on windy days or when working on rolling ground (or both). Switching to liquid N applied with sprayers eliminated the streaks (shown below), even on slopes or windy days because they delivered a consistent rate across the boom, especially when auto-steer and tramlines were utilized. Swath control has added to these advantages by minimizing any overlap in odd shaped fields.

Every year we conduct replicated trials to evaluate new crop management concepts before taking them to field scale trials.

Streaks and lower yields often result from spinning disc spreaders, especially when using light and dusty products like urea.

Taking field wheat yields above 100 bu/ac requires sound N management and timing, based on the needs of the crop. Uniform application of nutrients across the field is very important also.
The replicated trial data above represents the second application of liquid N (68 lb/ac of actual N) which was applied at jointing (Feekes growth stage 6) using the different methods outlined. We consistently see higher yields and lower levels of leaf injury with stream bar applied N compared to streamer nozzles and especially spray nozzles. If no rain falls within 7-10 days after the application with often see a yield benefit to adding Agrotain (or similar products) to the liquid nitrogen to reduce volatility. We also saw a yield response from adding 7 lb/ac of sulphur (in the ATS form) and N rates were adjusted to ensure all plots receive the same.

The replicated trial data (left) represents the second application of liquid N around the jointing stage (similar to the above bar chart) but this data is an average of four years of replicated trials conducted by Wheat-Tech, a crop management and research company based in Kentucky.

Both of these bar charts illustrate the importance of uniform delivery of liquid N, without damaging the leaves during the second spring application. There are still growers out there that mix a herbicide with the nitrogen, this is a practice that we strongly discourage.
Liquid Nitrogen Application To Wheat

7 hole fertilizer caps raised higher above the crop when working on rolling ground, often result in streaks.

3, 5 or 7 Hole Fertilizer Nozzles.

Most new sprayers are equipped with swath control and auto-steer systems, making them an efficient and high capacity platform to apply liquid nitrogen to wheat and other crops. The challenge is not the sprayer itself, instead it’s the nozzles used to deliver the liquid fertilizer to growing crops. While 3, 5 or 7 hole fertilizer nozzles are often an improvement over flat fan nozzles (see data on previous page), because they don’t cause as much leaf burn, the 3, 5 or 7 hole nozzles often don’t deliver the liquid nitrogen as evenly as a flat fan nozzle. The weaknesses of the 3, 5 or 7 hole nozzles often become visible when operating at higher forward speeds or when applying liquid nitrogen on windy days (or both). Within these conditions the streams are broken up, which results in more leaf injury and yield loss. 3, 5, or 7 hole nozzles often result in parallel streaks as illustrated in the images right, especially when operating on rolling ground when the booms can’t be held at a consistent height above the crop.

These streaks result in different standards of plant health, varying head emergence dates (this is very important when applying foliar fungicides for scab at flowering) and different head sizes. A good example is provided right, the head on the left came from a yellow streak and the head on the right came from a green streak. Look at the difference in heads and flag leaf length and color.

Streaks and crop injury from 7 hole nozzles when liquid nitrogen was applied at an angle to the wheat rows.

Streaks from 7 hole fertilizer nozzles are visible in this wheat at early head emergence. The wheat was planted across the direction of nitrogen application. Differences in head size and flag leaves are shown below left.

Streaks from the 7 hole fertilizer nozzles shown in the above image were still visible from the combine.

Visit our website at www.needhamag.com, for additional information.
Uniform Application Of Liquid Nitrogen With Stream Bars

This 2nd spring application of nitrogen is being applied to wheat with a Miller Nitro. This application and the one ahead of it, were made with Chafer stream bars. Field uniformity is the core of high yields, so applying liquid nitrogen with Chafer Stream bars will help deliver the product evenly and accurately with little to no leaf injury.

Benefits of Chafer Stream Bars

Reduced Crop Injury compared to spray nozzles, or 3/5/7 hole nozzles.

Stream Bars deliver large droplets of nitrogen vertically down into the crop, which roll off the leaves, down onto the soil surface. This technique results in little to no crop injury and reduced tie-up of N on residue (especially when comparing N broadcasted with spray nozzles to N applied with stream bars).

Unaffected By Boom Height

Unlike 3, 5 or 7 hole fertilizer nozzles, Stream Bars create vertical streams. This means that the application pattern is consistent regardless of boom height. Maintaining a consistent boom height is a challenge in most fields, especially rolling fields. Stream bars can be operated at any height, especially closer to the ground on windy days to help minimize stream disruption and leaf injury.

"I applied 32% liquid nitrogen with sugar using flat fan nozzles and it burned the crop badly. When I switched to Chafer Stream Bars there was zero burn on my wheat, barley and rye, even in the corners". Jim Arnaud, Monett, MO.

For more information on how Stream Bars deliver liquid fertilizer more uniformly than other methods, search for "Post Applying Liquid Nitrogen To Wheat" at youtube.com or scan the QR code to the right.

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com
Standard Stream Bars

Key Benefits:

- Highly accurate.
- Minimal impact of boom height or wind speed.
- Allows producers to deliver liquid nitrogen uniformly to wheat with virtually no leaf scorch.
- Available for 20” or 15” nozzle spacing.
- Now available for Spraying Systems/Teejet, Hardi and Wilger/Case-IH AIM (with a Wilger adapter).
- Designed to deliver a wide range of application rates, from 5 gallons to over 50 gallons per acre (using specific orifices, which offer rate ranges).
- Reduced N losses. Large droplets bounce off leaves and residue to drop down to the soil surface, reducing tie-up of N and boosting N availability.

Stream bars allow late season N applications with minimal leaf injury. This late application of 10 gallons of 28% N exhibited minimal scorch.

Visit our website at www.needhamag.com, for additional information.
Multi-Rate Stream Bars

Key Benefits:

- Multi-Rate Stream Bars have a sliding bar which allows operators to quickly change output without removing or disassembling the stream bar.
- No metering orifices need to be purchased, saving money and risk of losing them, or getting them mixed up.
- Allows producers to deliver liquid nitrogen uniformly to wheat with virtually no leaf scorch.
- Available for 20” or 15” nozzle spacing.
- Available for Spraying Systems/Teejet, Hardi and Wilger/Case-IH AIM (with a Wilger adapter).
- Stronger than the standard bars.

Customers stated how much they liked the performance of our original stream bars, but they did not like having to change metering orifices each time they significantly changed product rates or forward speeds. In an intensive wheat management system, it’s common to split apply nitrogen, when the application rates vary from around 10 gallons all the way up to 30 gallons or more. Multi-Rate stream bars help allow these rate adjustments by incorporating a sliding rate adjuster. This slide allows the application rate per acre to be quickly changed without having to remove or disassemble the stream bars. A chart is provided with all stream bars, just select the right orifice and enter the gallons required per acre into your rate controller to begin streaming.

What a farmer has to say about our Stream Bars:

“I bought a set of streamer bars from you this spring for topdressing wheat, they are best investment for the spray rig yet”.

Chuck Downey, St. Francis, KS.

| Multi-Rate Stream bars for 15” Nozzle Spacing | $21.00 each + shipping
| Multi-Rate Stream bars for 20” Nozzle Spacing | $21.00 each + shipping
| Wilger adapters | $2.00 each + shipping

For more information or to order, call (270) 785 0999, or email us at phil@needhamag.com

Well Sown = Half Grown

This professionally published hard red winter wheat (HRWW) guide includes 140 pages, which contain 374 color photographs, tables and graphs. This publication provides a practical and research based approach which builds on our previous 84 page (HRWW) guide by adding significantly more information on nutrient management, seeding rates, population management and chemical programs, plus it contains new information and recommendations on spraying, seeding equipment and residue management options available across the Central Plains.

This guide is written by Phil Needham and is designed to walk a producer, dealer or agronomist, step by step through the management practices required to help create the potential for higher HRWW yields and profits from the very start. It begins with residue management of the previous crop, fertility recommendations and herbicide strategies, then follows up with seeding rates, seed treatments, planting dates, and seeding system recommendations. While it does focus closely on no-till practices, it also has information on tillage systems.

The guide continues by providing management strategies through the fall, such as field scouting and insect management strategies. Spring nitrogen rates, products and timings are discussed in detail next, followed by growth regulators and disease management. While this production guide focuses on HRWW production across TX, OK, KS and NE, most of the management practices discussed will help producers within other HRWW production areas.
Managing Your Way To Higher Profits.

This professionally published soft red winter wheat guide contains **120 glossy color pages** and 330 color photographs, tables and graphs. It includes most of the crop management technologies required to help soft red winter wheat producers across the eastern US and south east Canada take their wheat management to the next level.

This guide was written by Phil Needham and published in 2012 and it walks producers, dealers and agronomists step by step through the growing season. The guide offers a balance of replicated research and field experience across the SRWW production region to help build a sound foundation to create higher yield potential and greater profits from the very start.

The guide begins with residue management of the previous crop, seed selection criteria and fall fertilizer recommendations. It continues with seeding technologies, no-till and conventional tillage systems. The guide outlines how to conduct stand counts and the ranges were looking for within specific planting date ranges.

Spring management strategies are discussed next with nitrogen products, rates and timings, all the way through to fungicides, insecticides, herbicides and growth regulators. This guide also features a comprehensive section which discusses most wheat diseases and viruses found across the Eastern US and south east Canada.
Our new Hard Red Spring Wheat management guide is now available. This is definitely our most comprehensive wheat management publication to date, with over 200 color pages, which include over 300 photos, graphs and tables.

This Hard Red Spring Wheat Guide is written by Phil Needham to help growers, dealers and agronomists across the Northern Plains and Western Canadian Provinces determine the weak links within their production systems. Once these weak links are isolated, as many as possible need to be eliminated to increase yields, grain quality and profits.

The Hard Red Spring Wheat Guide contains major sections on soil quality, managing residue, seeding equipment and fertilizer placement strategies. It also discusses important topics such as seed quality, seeding rates, seed treatments and the importance of uniformity of seed treatment applications.

The publication also covers the importance of stand uniformity, emergence consistency, plant health, canopy management and post-applied nitrogen strategies, to make better use of light, moisture and nutrients.

Visit our website at www.needhamag.com, for additional information.
4 years ago we started searching for a type or brand of grease which performed best within seeding equipment pivot points, especially the depth adjust axles on John Deere drills and air-seeders. Previously, growers found some types of grease combined with dust and they dried out, causing seizing and what’s called “cake-lock failure” and this results in costly tear downs and re-builds.

We had farmers try different grease products on their farms and we determined that the Lucas X-TRA grease was the best one we tested from a lubricity perspective over time, especially in dry/dusty environments.

**Technical Specifications From Manufacturer**

Virtually wash-out proof. Stands up to high temperatures and stays soft in very low temperatures. EP fortified and exceeds OEM specifications.

Lucas X-TRA Heavy Duty Grease was formulated for automotive, agricultural, heavy-duty and industrial applications. It is virtually waterproof and is more stable than all conventional lithium grease. It is fortified with an extreme pressure additive package and it exceeds OEM Lube for Life specifications.

**Key Benefits**

- Lasts four times longer than regular grease
- Virtually waterproof
- All temperature stable
- Exceeds “Lube for Life” specifications
- The ultimate grease for pivoting applications in dusty environments.

Lucas X-TRA Heavy Duty Grease

Pack of 10 x 14.5oz tubes (as shown above).

$49.00 Plus Shipping

Pack of 30 x 14.5oz tubes (3 x packs of 10, as shown above).

$135.00 Plus Shipping
New Products For Winter 2017

Publication Date: November 15th 2017.

All prices and product specifications are subject to change without notification. Please visit our website at www.needhamag.com for the most current price and product information.