



# **MORRIS**

## Customer Clinic 2017



**C2 CONTOUR**



# C2 CONTOUR



## General

- Check hose connections
- Check bolt torque on drill after two days of use

## Lubrication – Grease (ref: sec 6-4 Operators Manual)

- Castor Fork Grease – every 50 hrs
- Wheel Hubs – every 500 hrs
- Opener Wheel Hubs – every 200 hrs or seasonally (whichever comes first)
- Repack main wheel hubs yearly

## Tire Pressure (ref: sec 6-3 Operators Manual)

- Inflate to proper tire pressure
- Check pneumatic opener tire pressure is minimum of 10psi (if equipped)

## Transport (ref: sec 5-4 to 5-7)

- Tighten Wheel Bolts
- Transport Lock Valve is in use (wings)
- Openers Lock Valve is in use

# C2 CONTOUR

## Unit Requirements

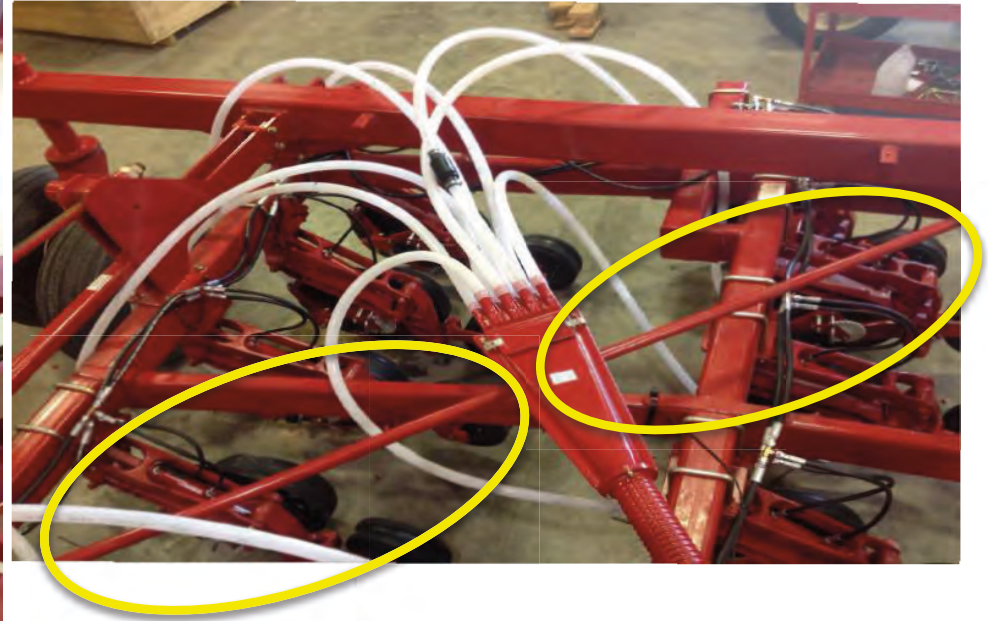
### Hydraulic Flow & Horsepower

- C2 requires around 20gpm for lifting and lowering the openers quickly
- Flow can be set lower, lengthening cycle times accordingly
- We usually say you need 4.5-5.5 hp/opener to pull a C2 with common paired-row and double-shoot boot at 5mph



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### Frame

#### Frame & Opener Mount Bolts:

- Good practice to retorque all frame bolts after 50hrs of use

#### Truss Rods:

- Always Keep truss rods snug



## C2 CONTOUR

# Frame - Hitching

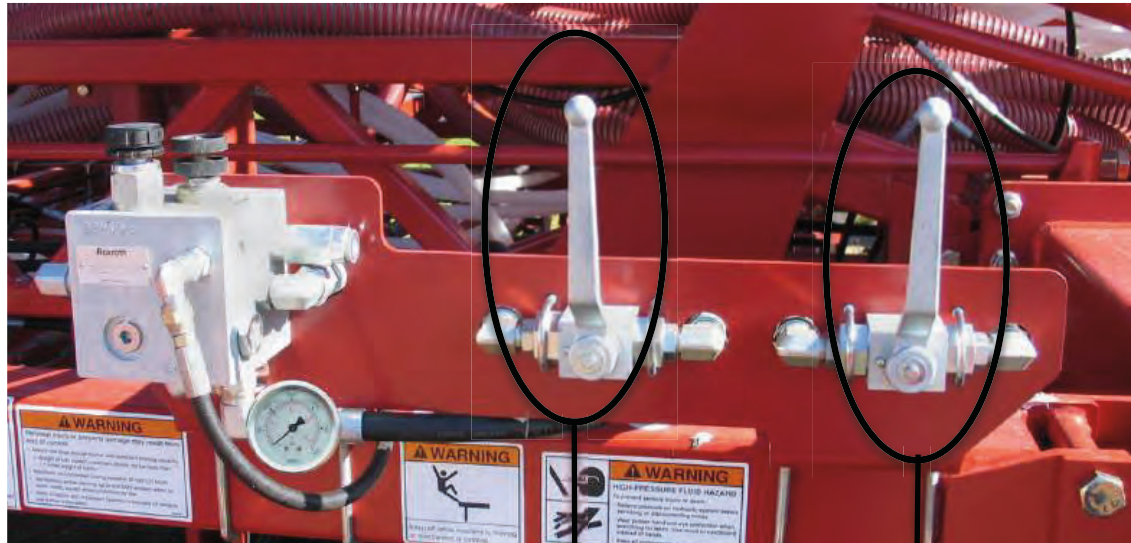
**Important to note** that C2 hitches are built to be pulled forward primarily. It is best practice to **NOT** pull the hitch sideways in any situation, especially if stuck, as damage can occur.



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## Transport



Openers Valve

Wing Valve

### Wing Lock/Opener Lock Valves:

- Valves shown closed
- Close valves for transporting the drill
- Open valves before winging machine down or operating the openers

### Notes:

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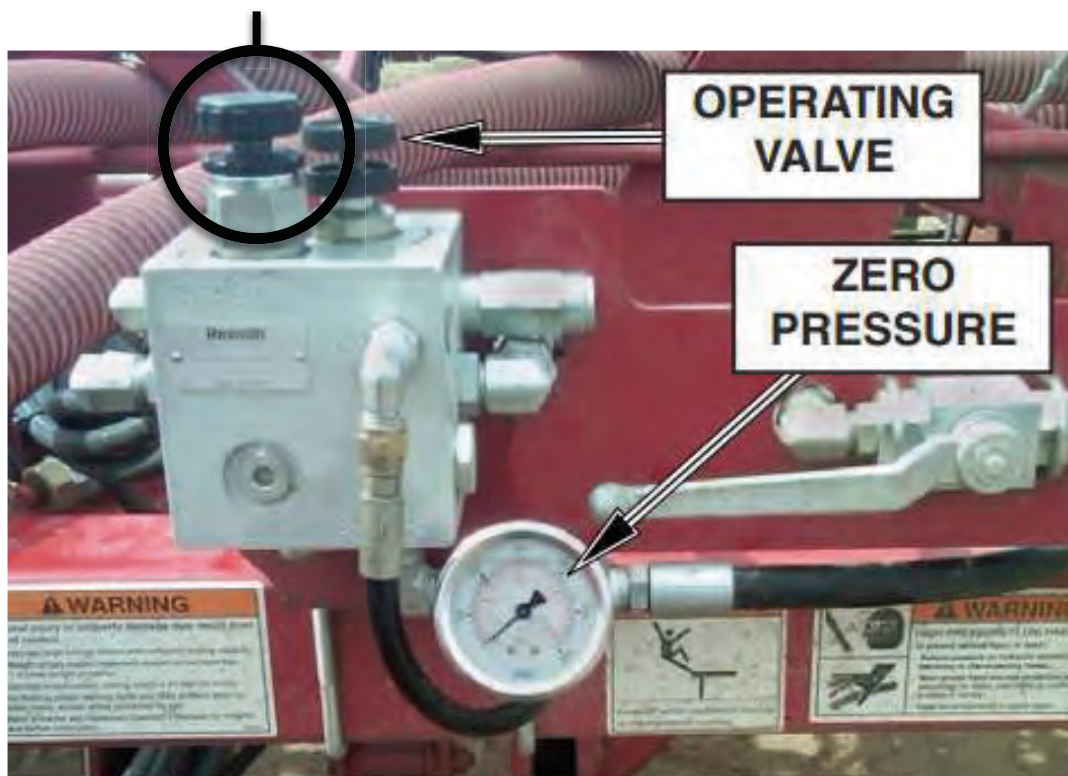
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# C2 CONTOUR

## Opener Hydraulics

Pressure Adjustment



### CAUTION:

Pressure can be stored by the accumulator and must be relieved using operating valve before servicing

### Operating Valve:

- Constant Pressure Operation: Operating Valve should be closed during drill operation
- Reducing Pressure On-the-Go: Open Operating Valve “set to Bleed Off/ Service Position” and put tractor remote in “Float” to bleed off pressure; use tractor remote to charge pressure back up when needed
- Open Operating Valve before servicing “set to Bleed Off/Service Position” and relieve pressure from opener circuit using tractor remote

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## Opener Pressure Adjustment:

- Reducing Valve can be set for maximum working pressure of the openers (divide gauge pressure by 1.5 to determine lbs of trip out force i.e. 800psi = 533lbs)
- Set pressure to 100-150psi above desired working pressure to allow for accumulator cooling and valve hysteresis
- Set valve by unscrewing locking nut and adjusting knob in or out for more or less pressure (make adjustments with no pressure in circuit)

### NOTE:

- Divide gauge pressure by 1.5 to determine approximate trip force i.e. 800psi ~ 533lbs trip force
- Packer force is approx. 1/3 of trip force i.e. 533lbs trip force ~ 177lbs packer force

# C2 CONTOUR Hydraulic Pressure Setting

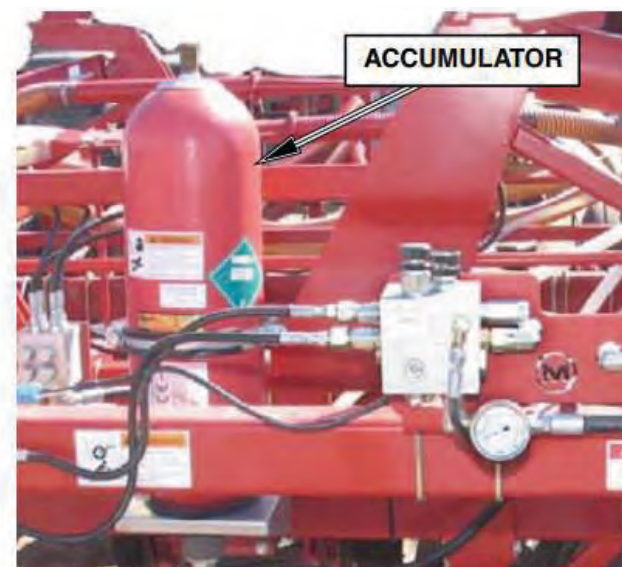
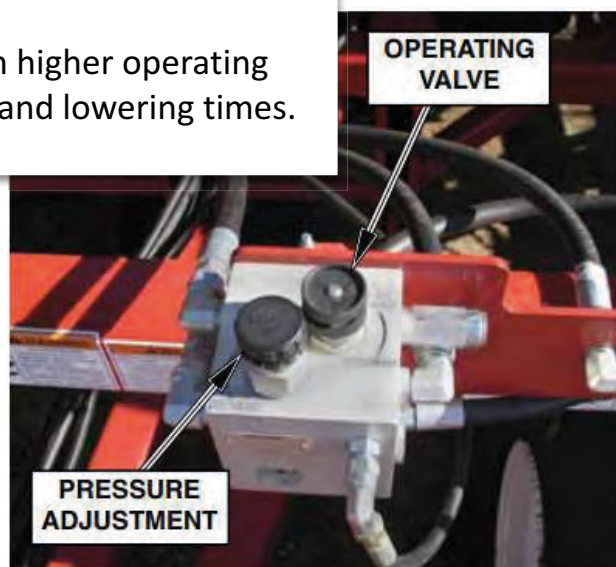
- Always turn “Operating” valve out to bleed off/service position and relieve hydraulic pressure from the system before performing maintenance or repairs.

**Note: Accumulator can store pressure even when disconnected from tractor.**

- The gas bladder in the hydraulic accumulator should be pre-charged with dry nitrogen gas before being mounted on the unit.
- Different accumulator pre-charge pressures will allow for different ranges of trip out force, as show in the chart.
- Pre-charge pressure should be set for the most common working conditions.
- Lower pre-charge pressures with higher operating pressures will give longer lifting and lowering times.

Accumulator Operating Range		
Nitrogen Pre-charge Pressure	Display Pressure	
	Minimum	Maximum
350 psi (2413 kPa)	450 psi (3102 kPa)	1200 psi (8274 kPa)

\* Maximum system hydraulic pressure is 1200 psi or 4 times the pre-charge pressure, whichever is the lower number.



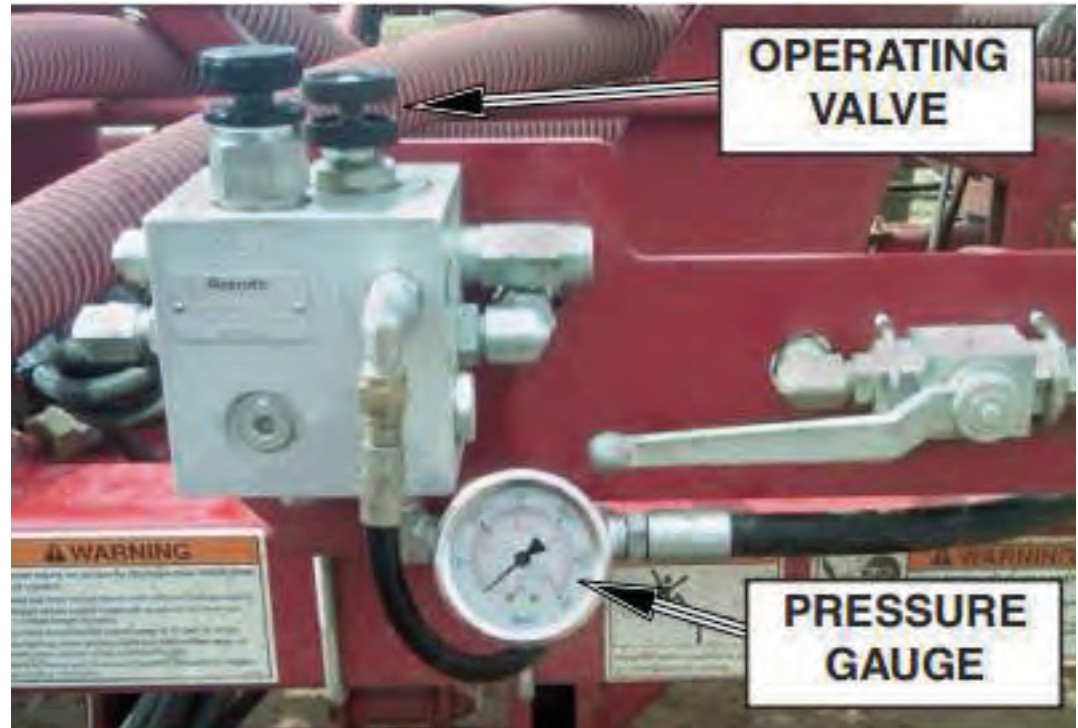
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## C2 CONTOUR

### Bleeding Off Hydraulics

To Bleed all pressure from Opener Hydraulic system:

- Open “Operating” valve to service/bleed-off position
- Lift openers to transport position
- Let openers drop and pressure go to 0 psi (or near 0 psi) on gauge
- Lift openers to transport position and lock “Openers” valve





# Bleeding Air From Opener Hydraulic System

The Contour Air drill hydraulic system should be thoroughly bled of any trapped air before being put into service. The following steps can be used to bleed the hydraulic system:

1. Assemble openers and hydraulic lines and fittings to frame and check the machine for leaks by operating hydraulics to move openers up and down.
2. Lift openers up and lock tractor remote in lift position.
3. With tractor hydraulics operating, open bleed-off ball valves on end of drill wings.

**Note: If larger than 61' should do one bleed-off at a time so would take about an hour to bleed.**

4. Allow oil to cycle for 15 minutes then change direction of tractor remote to lower openers and cycle for another 15 minutes.
5. Close bleed-off ball valves and lift openers up.
6. Repeat steps 2 to 5 for a second time.
7. Close bleed-off ball valves and lift openers up.
8. Lock "Openers" valve and check to see that openers stay firmly in position.
9. If openers are spongy repeat procedure until air is gone.

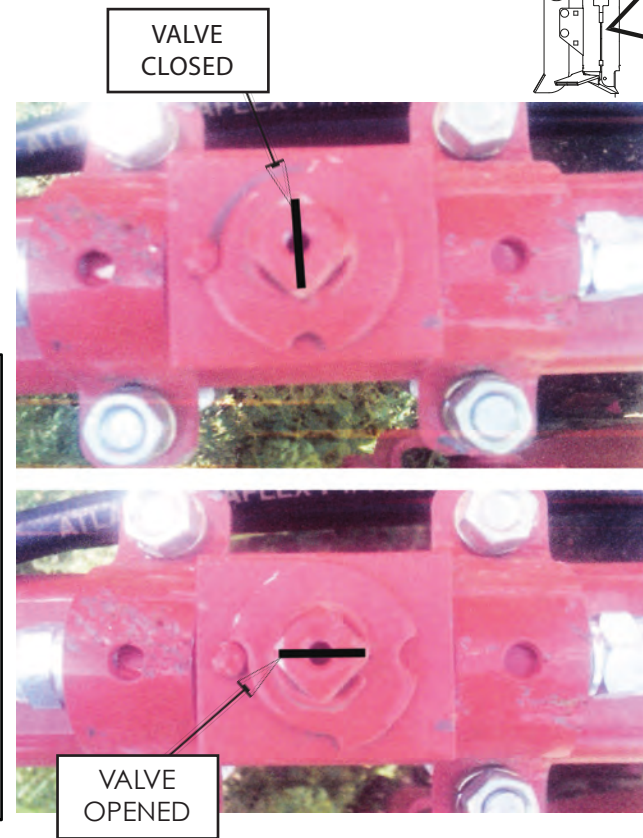
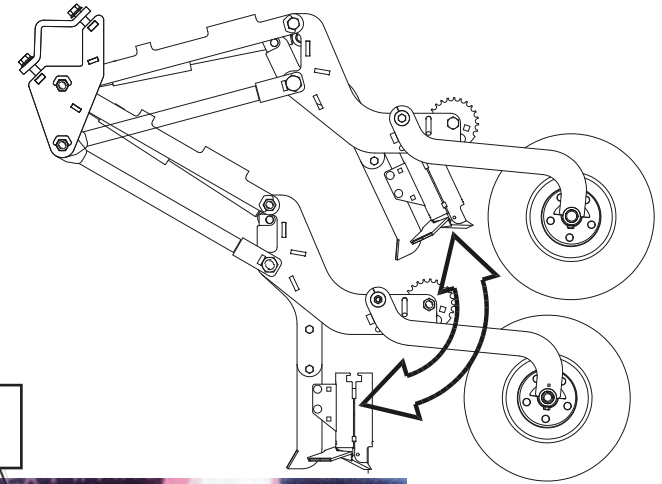
## Important

Once air is purged from the cylinders, raise openers fully.

Place hydraulic lever into float position, all openers should drop to the ground under their own weight.

If it requires pressure to push an opener down to the ground during this procedure, one or more of the pivot bolts are over tightened.

Check and adjust pivot bolts as required.



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### Quick Tips

**Shank trip force:** Shank trip force (lbs) is calculated by dividing the display pressure by 1.5 (ex. 600psi display pressure = 400lbs shank trip force). Shank trip out pressure is generally set at the minimum pressure that keeps the shanks solid in the vertical position and prevents them from repeatedly “tripping out”, while still providing adequate packing. If you notice packer assemblies “bouncing” or frequently moving up and down, you may have too little packing pressure for your conditions. You can increase hydraulic pressure, decrease depth setting and decrease speed to correct this problem. Maximum recommended shank trip out pressure is 1200psi. NOTE: The shank trip out pressure needs to be determined by the operator for each field.

**Packing force:** Packing force is proportional to shank trip out force and is roughly 1/3 of the shank trip force (ex. 500lbs shank trip force would give approximately 167lbs of packing force).

**Hydraulic system:** The Contour air drill uses a passive hydraulic system (no constant flow is needed from the tractor during seeding). Maximum operating pressure is set using the reducing valve on the frame (see Operator’s Manual). Pressure can be changed on the fly to adjust for variable field conditions by using the tractor remote with the valve in the Bleed Off/Service position. NOTE: It is normal for the pressure to drop 100 to 150psi from the initial set point while the accumulator gas cools (the reducing valve can be set higher to account for this initial pressure drop). If the pressure continues to drop quickly, check the machine for a cylinder, fitting, or hydraulic line leak.

**Hydraulic Requirements:** With the passive system, active hydraulic flow is only needed in operation when raising and lowering the openers. Anywhere from **19-25gpm is recommended depending on the size of the drill.**

# C2 CONTOUR

## Quick Tips

**Lifting and lowering the openers:** The openers do not need to be completely cycled from working to fully lifted position while turning. Openers can be lifted just to the point that they do not contact the ground while turning. When transporting the drill, lift the openers and ensure that the display pressure goes down to zero.

**Setting the seed depth:** Seed depth is measured from the packed soil surface to the seed. Set the seed depth on the drill by setting a few openers across the drill to different depths and seeding a test patch. Always seed the test patch at the same ground speed and opener pressure that you intend to maintain during regular seeding conditions. Then check the seed depth of these openers, pick the depth setting that you prefer, and set all openers to the desired letter setting on the depth adjustment cam. The openers perform best while seeding from 1/2" to 1-1/2" seed depth, but each customer is responsible for choosing their own depth setting according to their preferences and experience. Each adjustment notch on the adjustment cam is 1/4" adjustment. Shallow depth settings can be consistently maintained with the Contour air drill system.

**NOTE:** Be sure to check tractor and/or air cart tracks to see if the added soil compaction has affected the seed depth; the independent openers can be adjusted separately to compensate for wheel tracks.



# C2 CONTOUR

## Quick Tips

**Seeding conditions:** The Contour air drill is meant to be used as a minimum to no-till seeding system and care should be taken when attempting to seed into loose or pre-worked soil conditions. Shallow seeding depth, reducing operating speed and operating pressure may help reduce soil throw and ridging in soft conditions. The packer tire should be appropriately sized to the opener in order to seed into worked conditions (i.e. 550 tire matched to paired row opener). NOTE: Soil throw onto adjacent seed rows also occurs on conventional air drills with gang style packers, but is less visible because the gang packers pack all rows simultaneously at the back of the drill.

**Air drill frame:** The Contour air drill frame is a simple slab frame system, designed to let the parallel link openers do the work of depth control and leveling during seeding. No leveling of the frame is required. During normal operation of the drill there will be very little weight on the rear tires of the frame. The rear tires may even leave the ground while traveling through sharp gullies; this is normal, and it will not affect the seed depth control of the openers. If the tires are lifted in the air consistently, optional weight kits can be applied to the depth beams near the rear axles.

### Relieve System Pressure

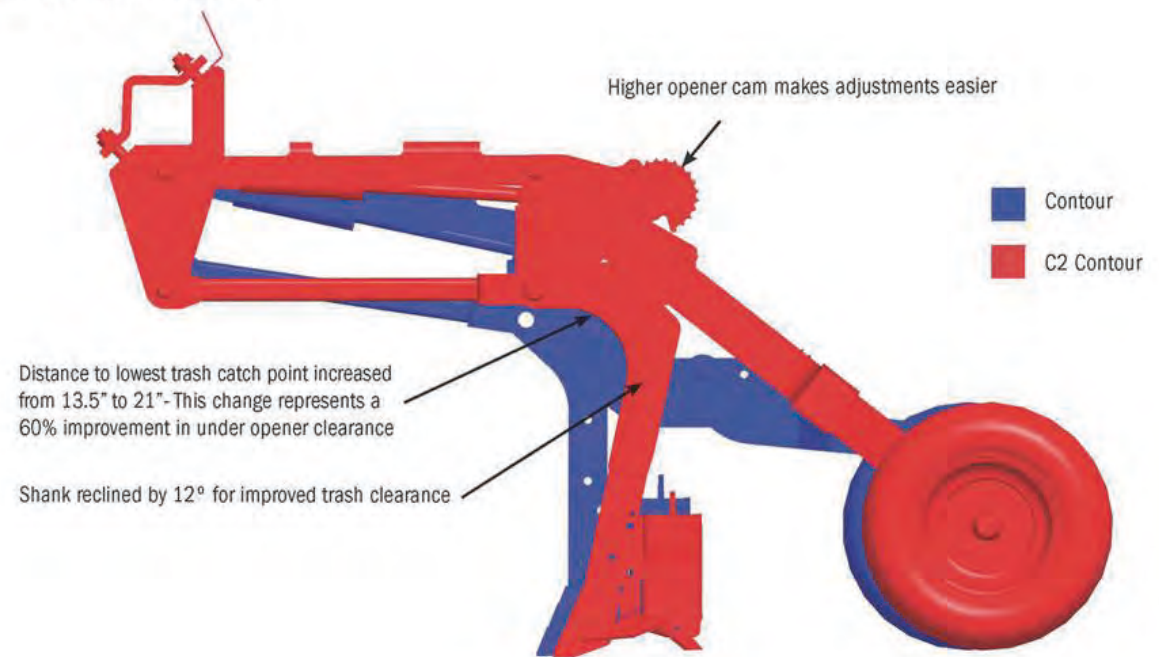
- To bleed all pressure from Opener hydraulic system:
- Open “Operating” valve to service/bleed-off position.
- Lift openers to transport position.
- Put tractor remote in “float” position.
- Let openers drop and pressure go to 0 psi (or near 0 psi) on gauge.
- Lift openers to transport position and lock “Openers” valve.

# C2 CONTOUR

## General

- Parallel linkage for excellent ground following capability
- Hydraulic cylinder used for shank trip-out/down-force and lifting/lowering of the opener
- One depth adjustment on each opener
- Single or double shoot boots available
- 4.8" air filled packers, 4.8" & 5.5" semi-pneumatic packer, 4.5" & 5.5" semi-pneumatic Otico packers or V-packer semi-pneumatic tires available
- **OPENER MAINTENANCE**  
(ref sec 6-5-14)

## C2 Contour:



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### Depth Setting:

- Lift openers and lock in transport position using “Openers” ball valve
- Start by adjusting a few openers across the drill and seeding a short distance until you have found your ideal depth setting
- Adjust the remaining openers to your ideal depth setting
- To adjust opener depth, remove lynch pin from 1/2” diameter depth pin and pull pin from adjustment cam notch - depth can be set in 1/4” increments
- Rotate depth adjustment cam and re-insert pin at desired depth; re-install depth pin and secure lynch pin
- Re-check depth and check wheel tracks to see if openers in wheel tracks need more/less depth setting
- A good starting point for depth settings would be setting “D”



# C2 CONTOUR

## Packer Wheel Options

			
<p>4.8" &amp; 5.5" semi-pneumatic packers</p> <ul style="list-style-type: none"> <li>• Ultimate low maintenance packer</li> <li>• Well suited to most soil types</li> <li>• Ideal for double shoot applications</li> <li>• Improved field finish with 5.5"</li> </ul>	<p>4.8" pneumatic 'air filled' packer</p> <ul style="list-style-type: none"> <li>• <b>Infinitely</b> adjustable Packers</li> <li>• Economical option</li> </ul>	<p>4.5" &amp; 5.5" semi-pneumatic Otico packer tire</p> <ul style="list-style-type: none"> <li>• Excellent "mud shedding" characteristics due to tremendous flexibility</li> </ul>	<p>V-packer semi-pneumatic</p> <ul style="list-style-type: none"> <li>• Suited for single shoot narrow knife applications</li> <li>• Very good in winter wheat planting where defined furrows are desired</li> </ul>

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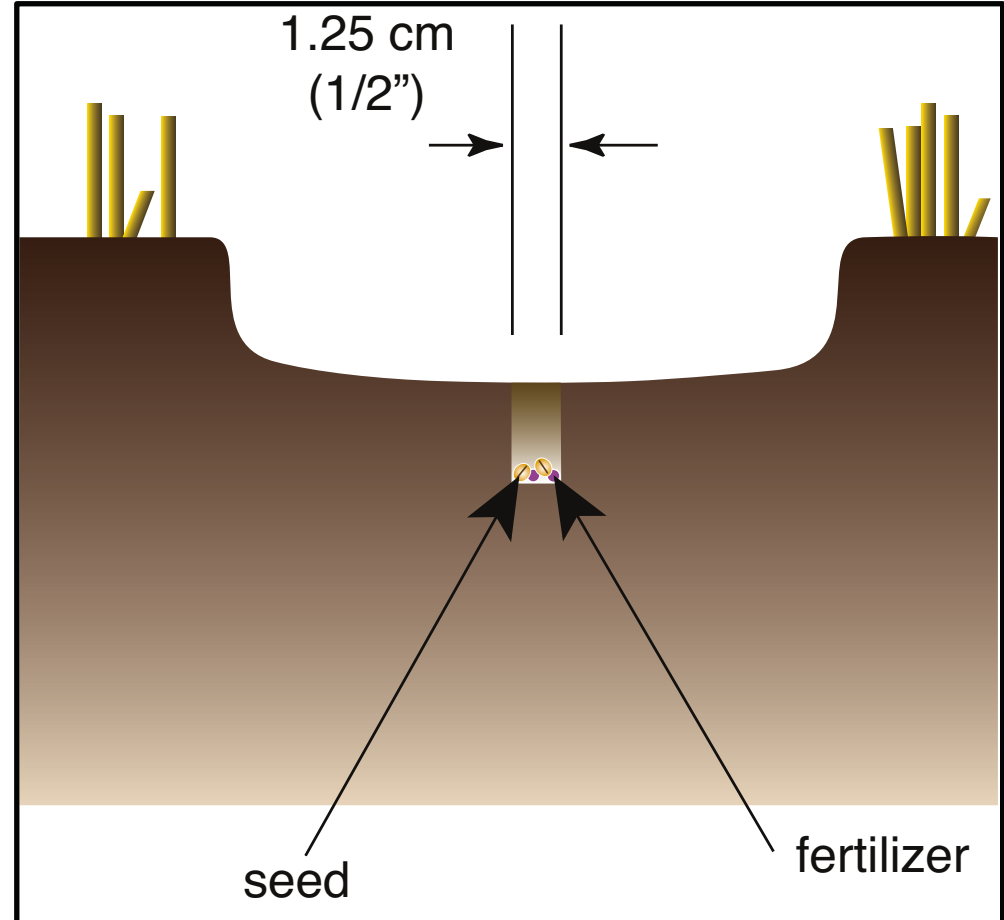
## Packer Wheels



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## C2 CONTOUR

### Single-Shoot Openers - Narrow Knife

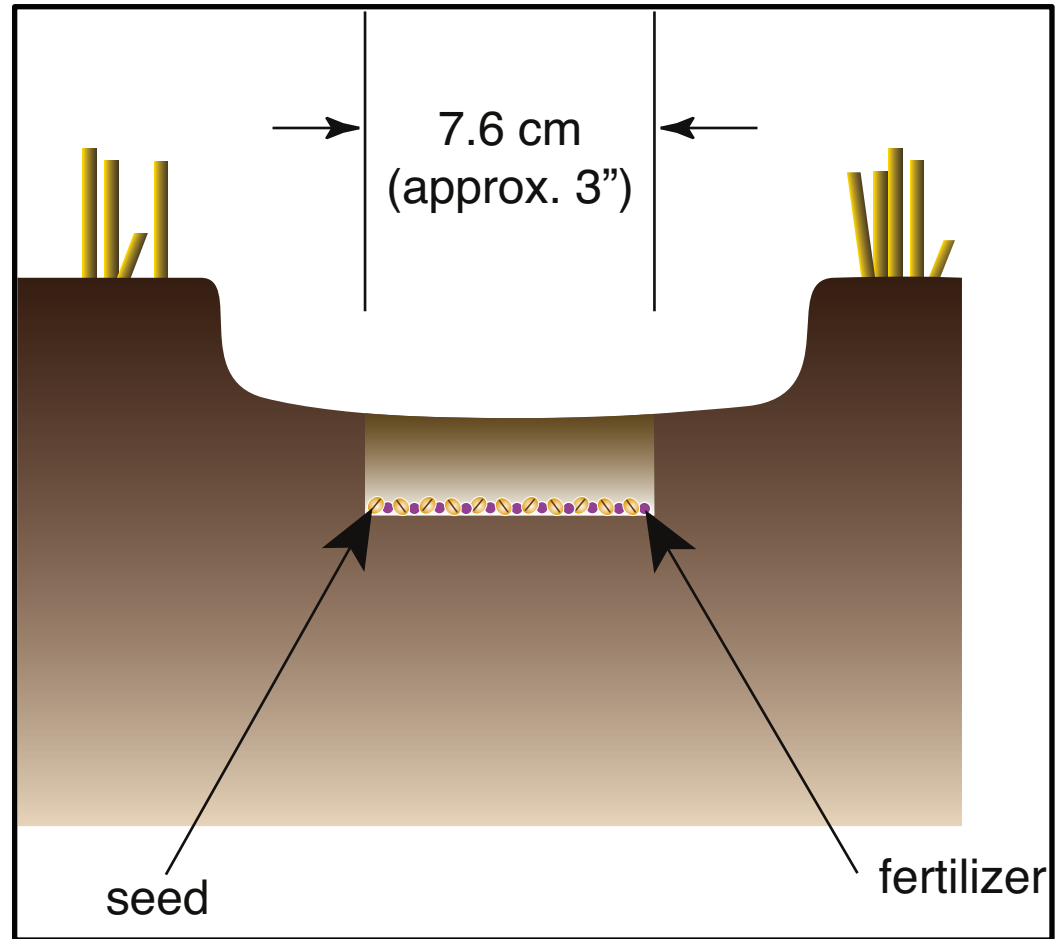


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## C2 CONTOUR

### Single-Shoot Openers - Spread Tip



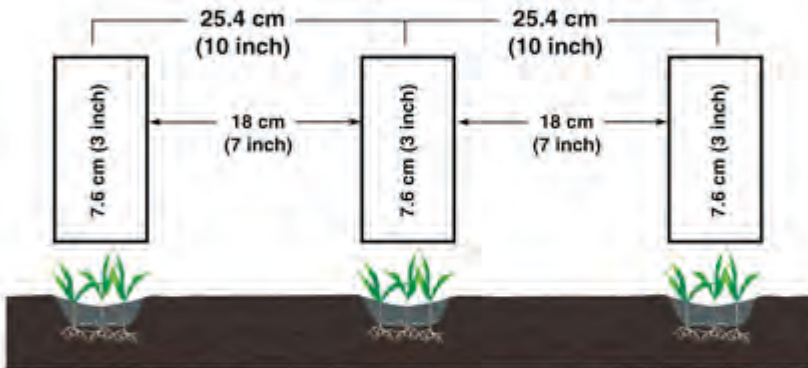
# CONTOUR DRILL

## Comparative SBU (Seed Bed Utilization)

### Spreader Tip vs Single Shoot Opener

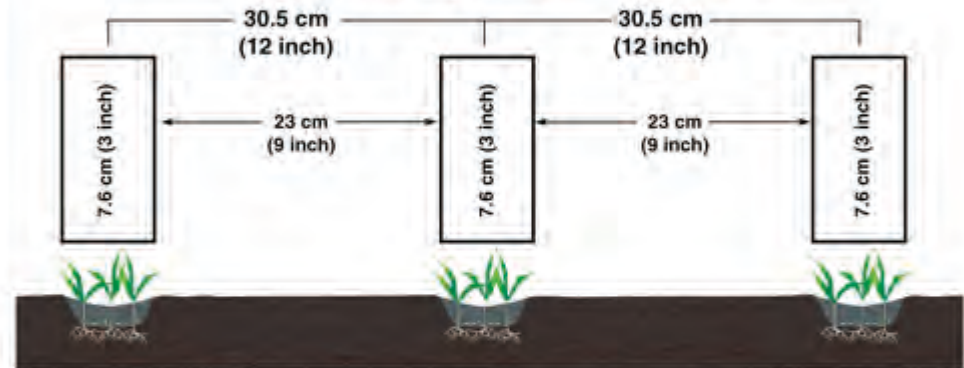
#### Spreader Tip

##### Spreader Tip 10 inch Spacing



SBU (Seed Bed Utilization) Spreader Tip 25.4 cm (10 inch) spacing = 30%

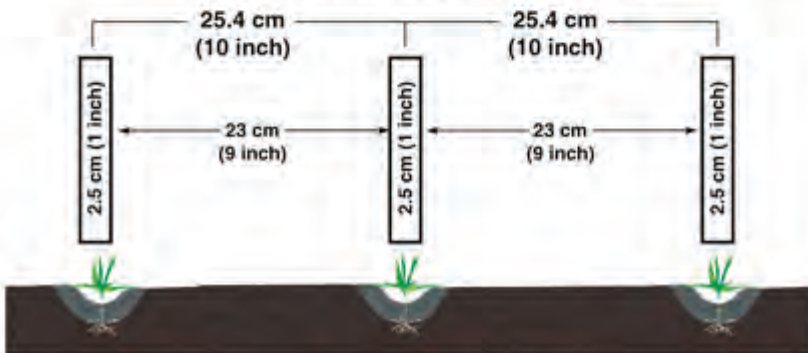
##### Spreader Tip 12 inch Spacing



SBU (Seed Bed Utilization) Spreader Tip 30.5 cm (12 inch) spacing = 25%

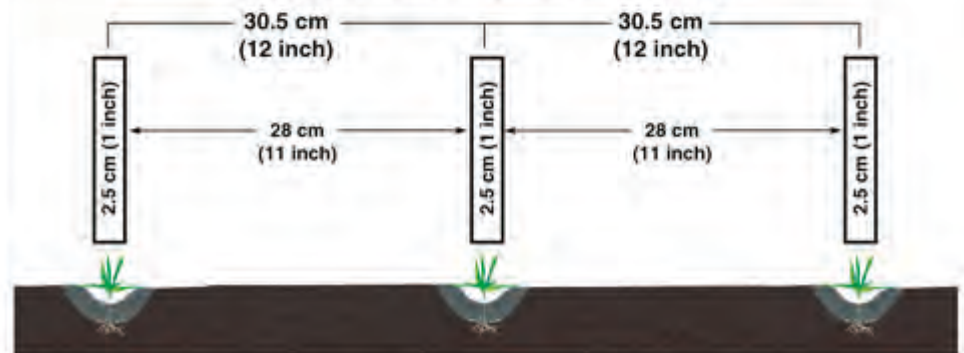
#### Single Shoot Opener

##### Single Shoot 10 inch Spacing



SBU (Seed Bed Utilization) Single Shoot 25.4 cm (10 inch) spacing = 10%

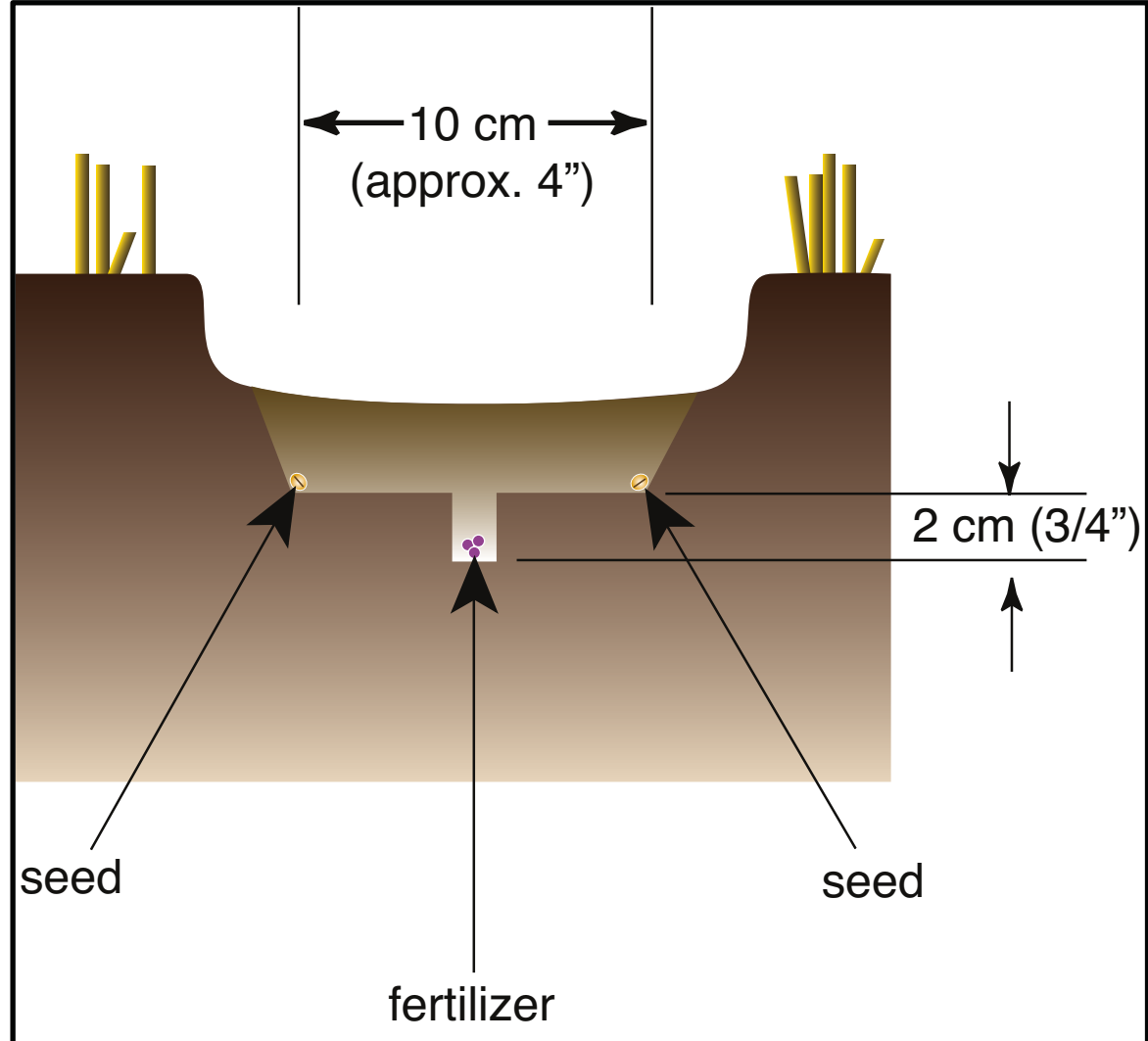
##### Single Shoot 12 inch Spacing



SBU (Seed Bed Utilization) Single Shoot 30.5 cm (12 inch) spacing = 8%

# C2 CONTOUR

## Double-Shoot Openers - Paired Row - IP Opener



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# C2 CONTOUR

## Double-Shoot Openers - Paired Row



Allows more efficient use of your land by providing better seed bed utilization.

On 25.4 cm (10") spacing, the distance between rows is approximately 15.2 cm (6") and on 30.5 cm (12") spacing, the distance is approximately 20.3 cm (8"). And, the paired row ensures an excellent stand for swathing.

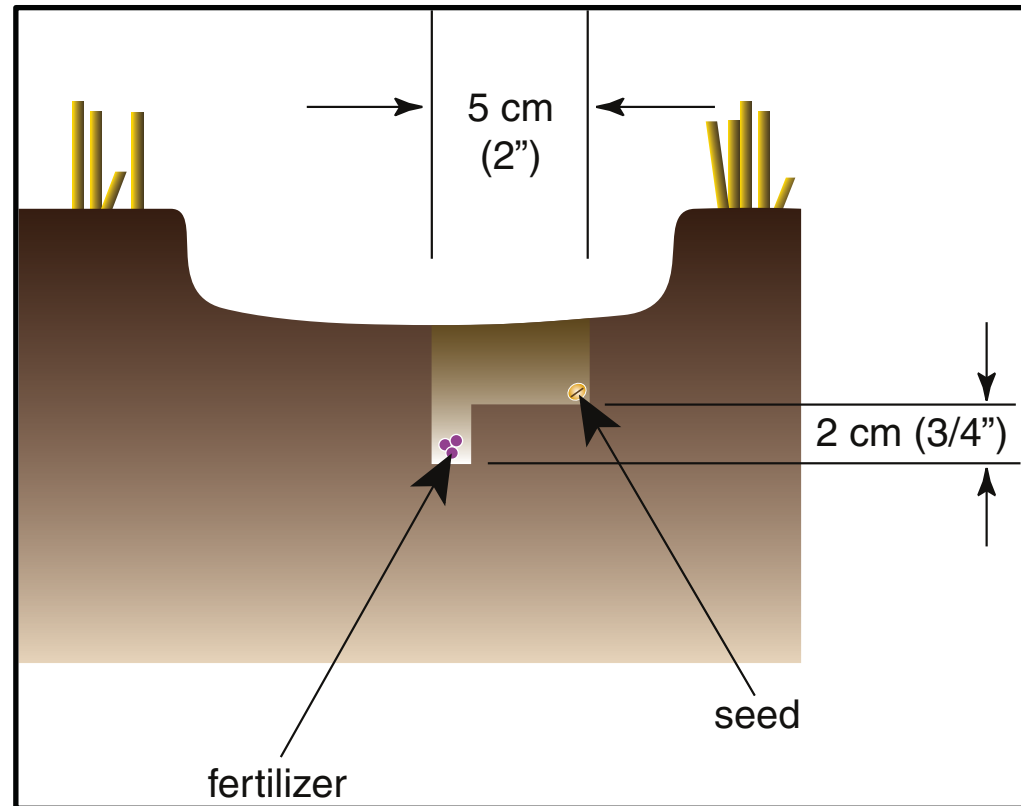
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# C2 CONTOUR

## Double-Shoot Openers - Side Band - IP Opener



This is replaceable





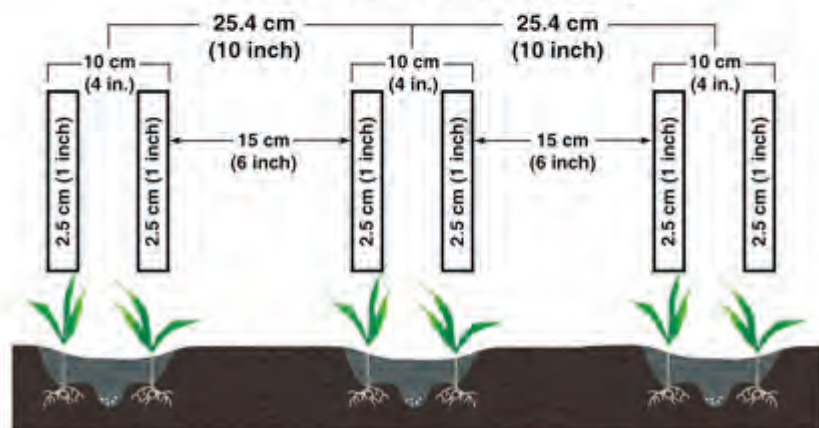
# CONTOUR DRILL

## Comparative SBU (Seed Bed Utilization)

### Paired Row Opener vs Side Band Opener

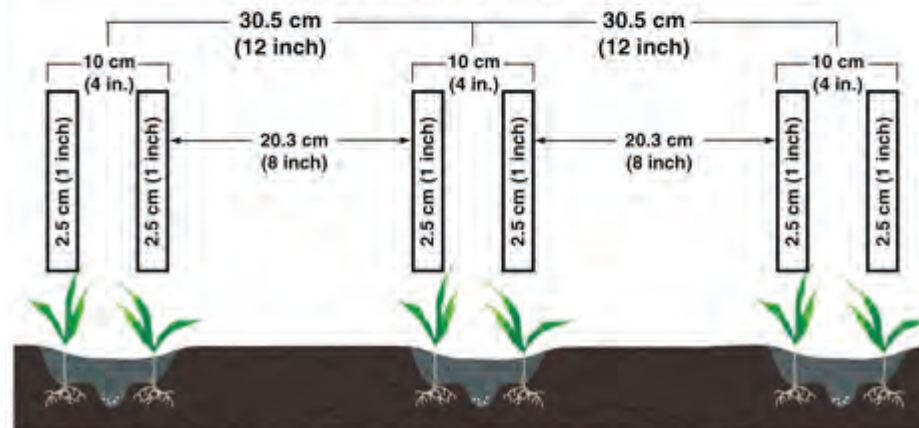
#### Paired Row Opener

##### Paired Row 10 inch Spacing



SBU (Seed Bed Utilization) Paired Row 25.4 cm (10 inch) spacing = 20%

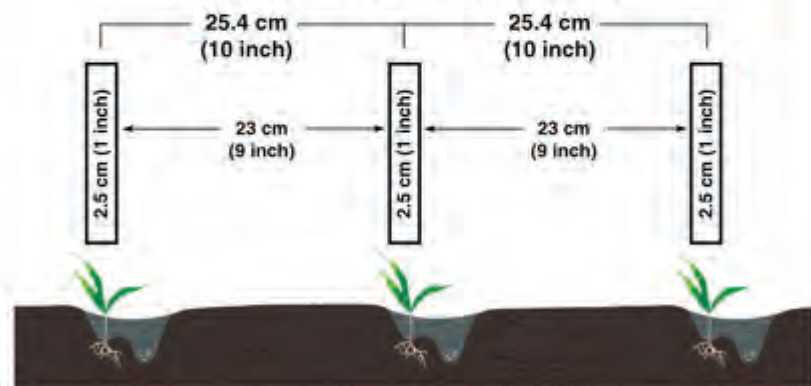
##### Paired Row 12 inch Spacing



SBU (Seed Bed Utilization) Paired Row 30.5 cm (12 inch) spacing = 17%

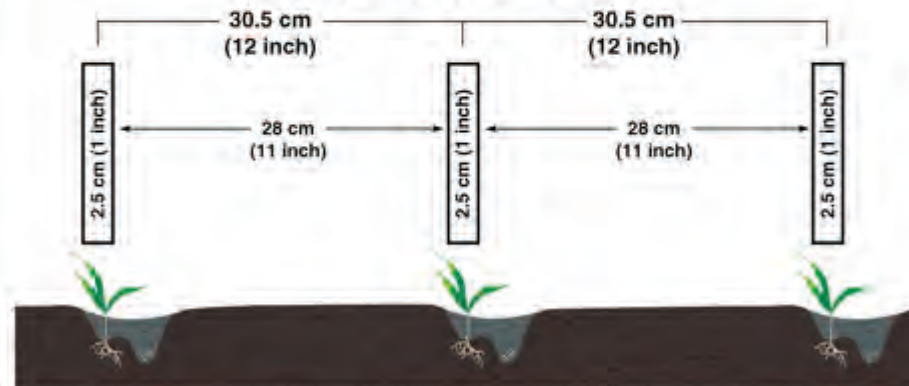
#### Side Band Opener

##### Side Band 10 inch Spacing



SBU (Seed Bed Utilization) Side Band 25.4 cm (10 inch) spacing = 10%

##### Side Band 12 inch Spacing



SBU (Seed Bed Utilization) Side Band 30.5 cm (12 inch) spacing = 8%



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Spring wheat planted by Contour drill  
at the University of Saskatchewan in  
2010.



Canola field west of Kindersley  
planted by C2 Contour drill.

## C2 CONTOUR

# Uniformity

*Agronomists believe that crop emergence uniformity is critical to maximizing crop yield potential. Well designed seeding equipment results in crops that emerge rapidly and uniformly with minimal seed mortality.*

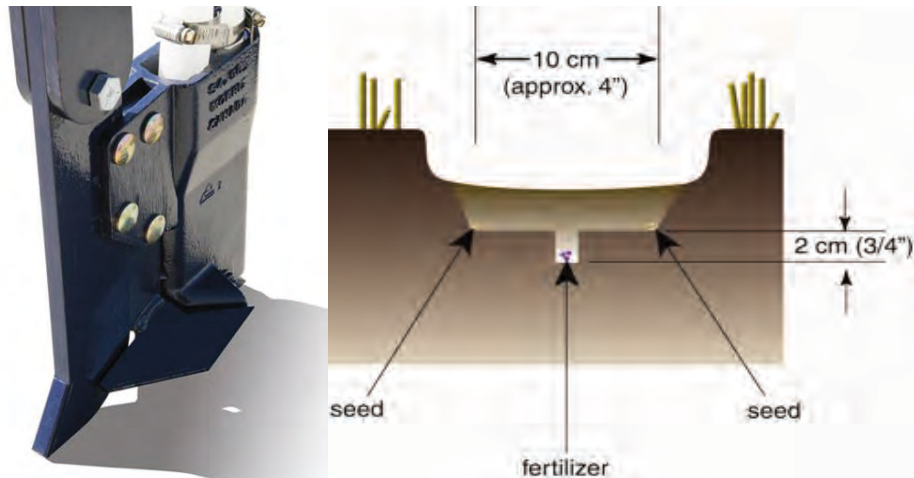
In order to achieve crop emergence uniformity seeding equipment must:

- A. Deliver consistent seed depth.
- B. Consistently achieve excellent soil-seed contact.
- C. Maintain distinct fertilizer-seed separation.

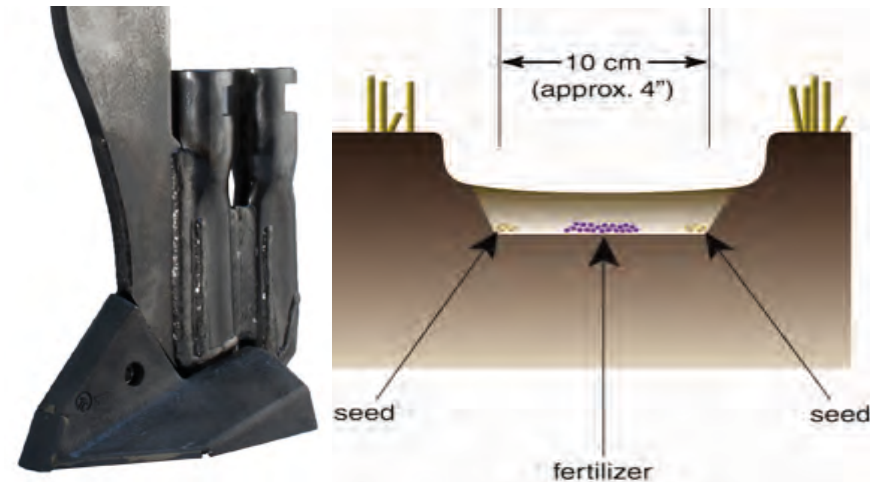
## C2 CONTOUR

Machine related factors that influence crop establishment: soil-seed contact (soil fracturing).

**Morris GETs**  
(fertilizer below)



**Aftermarket GETs**  
(same plane)



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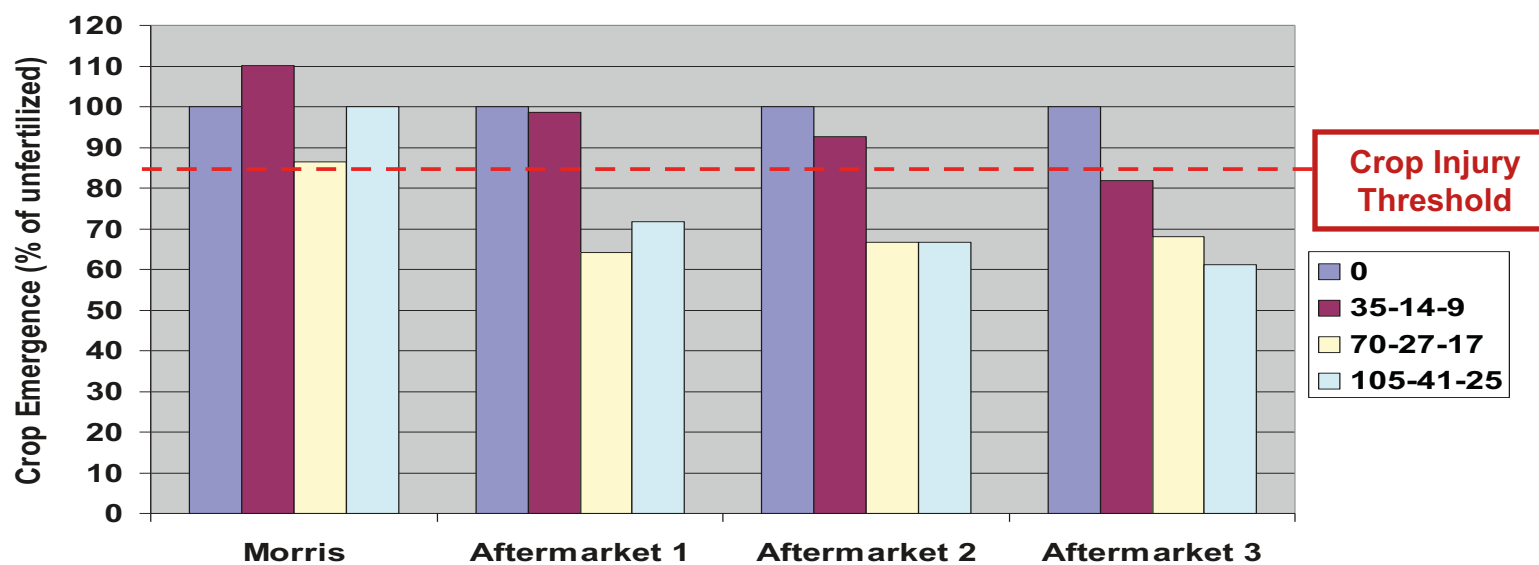


# C2 CONTOUR

## Fertilizer – seed separation

*Crop injury thresholds are a tool that Agronomists can use to assess safe fertilizer application rates with double-shoot openers.*

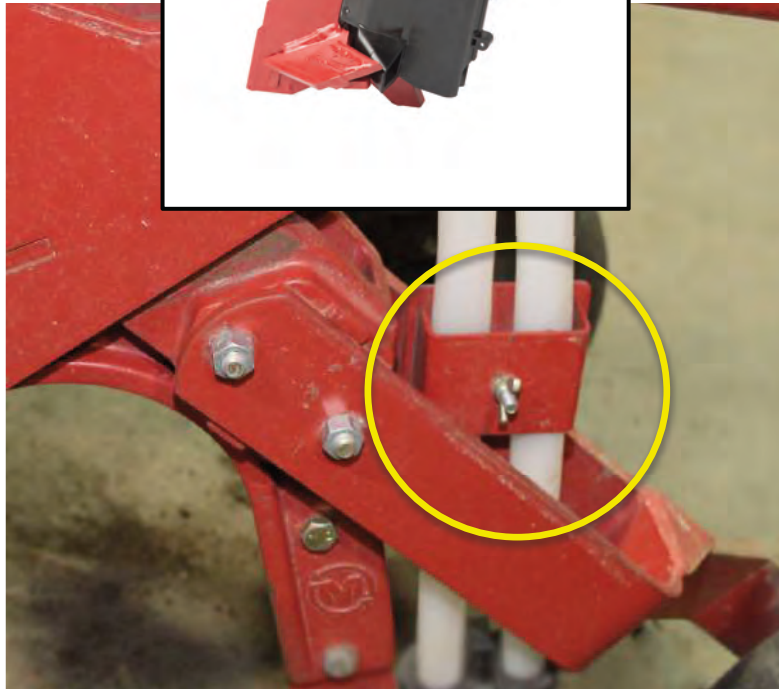
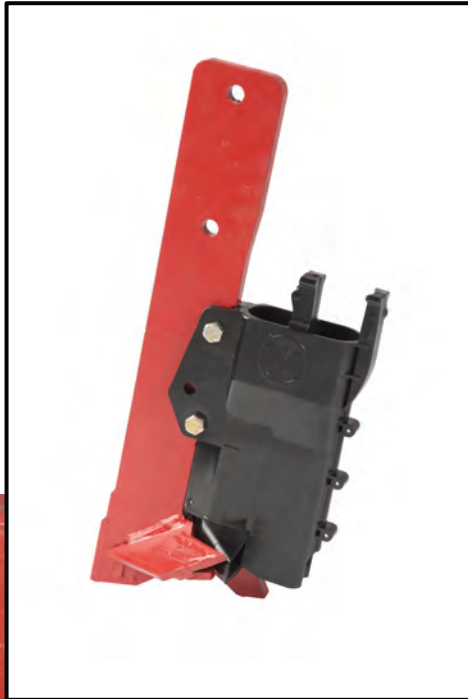
**Winter Wheat Emergence - % change in emergence with fertilization (13 dap).**



*Note: Morris openers are at or above the crop injury threshold at all fertilizer rates evaluated.*

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## C2 CONTOUR



## Available Options

**Side Band and Paired Row Openers are now available in either cast or injected polymer configurations**

### **Secondary Hose Holders**

#### **Mud Guards**

- Reduced soil build up in wet conditions

#### **Grommets**

- Prevents foreign material from entering the boot
- Reduced plugging
- Recommended

### **Fertilizer Options**

- Apply granular fertilizer
  - Single-shoot with the seed
  - Double-shoot banding - side band and paired row
  - Double-shoot with broadcast kit and single-shoot openers
- Apply NH<sub>3</sub> - with paired row
- Apply liquid fertilizer with Pattison Liquid Systems

# C2 CONTOUR

## Distribution

### Flat-fan Divider Heads

- Most efficient airflow system
- Smooth, horizontal flow of product
- No abrupt directional changes from the metering to the furrow
- Gentle on seed
- Reduced airflow requirements
- 2 available sizes (15/16") or (1 & 1/8")



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