



World Leader in Transplanting Technology

TRIUM or UniTRIUM Model

Set-up & Operating Instructions



v3 March 2020

Here is a list of key points to do when setting up a new Trium or UniTrium machine. The purpose of this manual is to explain how to properly adjust your machine. We will detail these key points, but to get started, here is an outline below.

The key is to have someone trained on your farm that becomes the C&M EXPERT! Please read and study this manual to understand how to maximize your success.



OUTLINE & Key-Point CHECKLIST:

There are 12 key items for optimal machine performance--



- 1) Well prepared/tilled ground.
- 2) Well prepared seedling/plug/clone.
- 3) Be sure you have the correct shoe size for your plugs/clones.
- 4) "IN THE ROW" SPACING - Make sure the "plant-to-plant" sprocket setting is correct
- 5) Ensure the machine is set/adjusted properly to begin.
 - 5-A) 3-POINT LINKAGE - The 3 point linkage must be either vertical OR leaning slightly toward the transplanter (NOT leaning toward the tractor).
 - 5-B) DRIVE WHEELS - Lower or raise the drive wheels to the point where the parallelogram (on each row - located close to the tool bar) is fairly level.
 - 5-C) DOWN-PRESSURE SPRING FOR PACKING WHEELS
 - tightening helps apply pressure to packing wheels
- critical*** 6) **TIMING - A very important adjustment on the machine**
- 7) PACKING WHEELS - Adjust the packing wheels
- 8) PLANT DEPTH - Adjust the depth gauge - which lowers or raises the packing wheels.
- 9) FRONT PRESS WHEELS - Adjust the front press wheels to where they touch ground and provide some compaction.
- 10) WATER - be sure the water is hooked up to the valves on our machines and set correctly.
- 11) PLASTIC GUILLOTINE - this helps the plant fall straight down and not fall over (oil this bearing daily during daily planting season)
- 12) OPERATOR WEIGHT ADJUSTMENT SPRING -adjust if one row is making a deeper furrow than the others.

close shoe furrow {

critical*

| Common HEMP Settings (in "normal" conditions, flat ground, regular soil) | |
|---|------------------------------|
| ADJUSTMENT | SETTING |
| Timing | see pict ==> |
| Depth Control | 5-6 |
| Packing Wheels (forward & back) | 1.75 |
| Packing Wheels (in & out) | 3.5-2.5 (notches showing) |
| Drive Wheels (approximately) | 4.5 |
| Press Wheels (approximately) | 3 |



If you have a 50-72 count hemp tray **this is very likely your "timing" setting** based on a speed of around 1.2mph. (See "TIMING" #6, page 7)

1) Well prepared/tilled ground

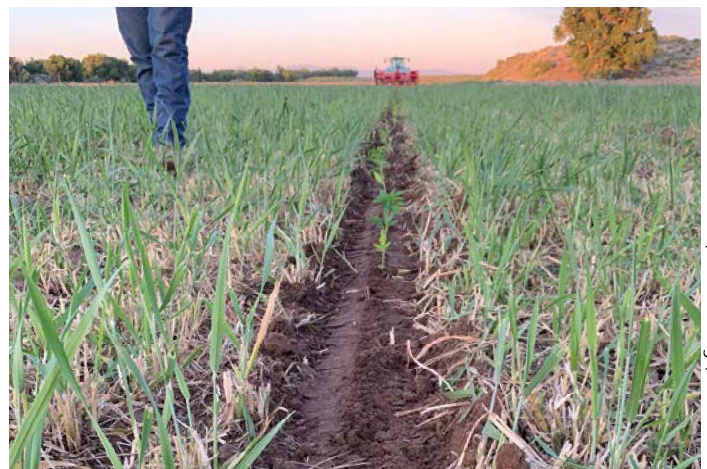
Farmers know that soil prep is critical for transplanting. Proper soil prep is critical for our transplanters to work properly. We need a consistent, cultivated depth of 4"-6" for the plant to be transplanted properly and thrive. **The only exception to this is when you use our Trium or UniTrium with the C&M "no-till package".**



This soil has been **recently tilled** and prepared. The ground must be well prepared.



This is how our machine is designed to perform. **Adjustability is key!**



Non-prepared ground will work with our **NO-TILL optional attachment.**

2) Well prepared seedlings/plugs/clones

It is imperative that by the time you go into the field you have a **healthy mature plug** to put into our machines. Critical to the Trium is that the complete plug pulls out of the tray and that the seedlings are fairly consistent in size. In this way they fall down our Trium throat into our shoe with consistent timing.



GOOD



GOOD



BAD

When the plug/seedling is not mature and well rooted, we see the seedling fall apart - or only part of the plug comes out of the tray. When the remaining plug then slides around in our carousel, more soil can tend to fall off or break apart the plug. The result is when the partial plug falls down into the shoe it will fall differently and will not plant like the other plugs. We must have mature, tight and consistent plugs - that easily pull out of the trays. We have found the best range of plant size is from approx 8" to 16" (top to bottom.)

One more thing regarding the seedlings/plugs would be to determine if you want to use our **cup reducer or cup extenders**.

Each machine should have these behind the seats.

- If tall plants then we recommend the cup extenders.
- If small, short plugs/plants then consider using the cup reducers.



cup extenders



cup reducers



Plugs must be grown in **TRAYS!**
(Not SOLO cups!)



for Trium/UniTrium

PLUG/CLONE
Maximum width
2" on top

Maximum width
1 3/4" on bottom



3) Be sure you have the correct shoe size for your plugs/clones.

As we have now been to many farms setting up Trium machines, **we have found that tray counts are all over the map as to the actual size of plugs** - for this reason we posted on our website and here important information regarding the shoe-to-plug marriage.

For example, we are finding many plugs/trays are smaller and so a 50 or 72 count plug might be smaller. In fact, *we saw some 50 count trays that have plug sizes at the bottom of the plug of 1 1/3" – which is perfect for our # 4 shoes.* We have now seen *several 72 count trays with 1" base plug width which is a perfect fit for our # 3 shoe.* We heard this same thing last year – *so many growers said "we need the # 5 shoes" only to find out their trays/plugs were smaller and they only needed a #4 shoe.*

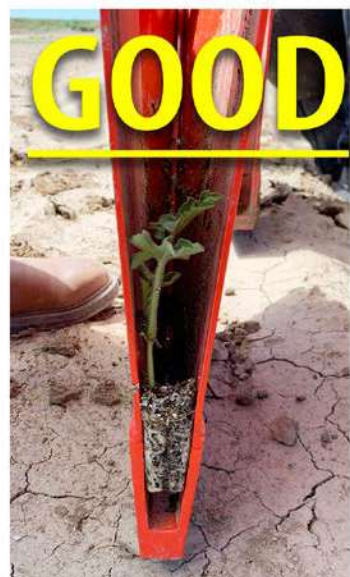
So we wanted to ask you to double check the size of your plugs before you decide on your shoe size. Unless the dealer specifies differently, number 2 and 3 shoes come standard with our Triums. (2 shoes are supplied as standard with our hemp machine.) **In many cases a number 3 shoe will be the right fit!!** We have many dealers asking for more and more #4 and #5 shoes and so we plead with you before you order any shoes to be sure that is what you really need.

The pictures here show a bad and good fit. With an ideal fit – either the plug falls to the very bottom with a tight fit OR is grabbed by the 2 sides even close to the very bottom – that still is a great match! The main thing is we do not want a loose plug - free to land on an angle in the shoe. AGAIN, we DO NOT want a loose plug in the shoe-- It will not work! You will see a difference in the Trium performance when the plug drops down into the shoe and is grabbed by the sides to be immediately kicked out.

| Shoe Size | bottom size mm | bottom size in | Shoe Kit Part # |
|--------------|----------------|----------------|-----------------|
| 1 (narrow) | 8mm | 1/3" | code 500832 |
| 2 (standard) | 14mm | 1/2" | code 500833 |
| 3 (middle) | 24mm | 1" | code 500834 |
| 4 (medium) | 33mm | 1 1/3" | code 500835 |
| 5 (large) | 43mm | 1 2/3" | code 500836 |



Here is a plug in a #3 size shoe. It is loose and will not work properly.



Here is a plug in a #2 size shoe. The ideal fit is a little higher in the shoe, approximately up to 1/2" from the bottom. It grabs the plug and prepares it to be kicked out by the kicker, perfectly straight.



Here is a 72 count tray, that is round, yet tapered. It will fit in a #3 shoe just fine because of its shape.

Note about design innovations for the KICKER



2020 KICKER

This new kicker mechanism is designed to work with a rotating joint and requires NO maintenance. Unlike the 2019 kicker, this new design has no bearing or springs.



2019 KICKER

This kicker needs to have oil applied to the bearing everyday when in use-- this is the only maintenance required for the 2019 kicker.

4) IN THE ROW SPACING -

Make sure the "**plant-to-plant**" setting is correct (refer to the chart on each drive wheel). Double check that each drive wheel is set properly.

An 8-row Trium unit has 4 drive wheels with rapid shift gearbox, and a 4-row has 2 drive wheels, just as an example. Up to 40" plant-to-plant spacing can utilize all 10 cups. Each UniTrium row unit has its own drive wheel.

UniTRiUM chart

| | cm | A | B | C | D |
|-----|----------|----|----|----|----|
| 100 | 39-3/8" | 10 | 24 | 16 | 22 |
| 92 | 36-1/4" | 10 | 22 | 16 | 22 |
| 83 | 32-5/8" | 10 | 20 | 16 | 22 |
| 75 | 29-1/2" | 10 | 18 | 16 | 22 |
| 67 | 26-3/8" | 10 | 16 | 16 | 22 |
| 63 | 24-3/4" | 12 | 18 | 16 | 22 |
| 60 | 23-1/2" | 14 | 20 | 16 | 22 |
| 56 | 22-1/16" | 12 | 16 | 16 | 22 |
| 52 | 20-1/2" | 16 | 20 | 16 | 22 |
| 49 | 19-1/4" | 12 | 14 | 16 | 22 |
| 45 | 17-3/4" | 20 | 22 | 16 | 22 |
| 42 | 16-1/2" | 12 | 12 | 16 | 22 |
| 38 | 15" | 22 | 20 | 16 | 22 |
| 34 | 13-3/8" | 22 | 18 | 16 | 22 |
| 32 | 12-5/8" | 18 | 14 | 16 | 22 |
| 30 | 11-7/8" | 20 | 14 | 16 | 22 |
| 28 | 11" | 22 | 14 | 16 | 22 |
| 26 | 10-1/4" | 20 | 12 | 16 | 22 |
| 23 | 9-1/16" | 22 | 12 | 16 | 22 |
| 21 | 8-1/4" | 24 | 12 | 16 | 22 |
| 20 | 7-7/8" | 16 | 18 | 22 | 12 |
| 18 | 7-1/16" | 16 | 16 | 22 | 12 |
| 16 | 6-1/4" | 14 | 12 | 22 | 12 |
| 14 | 5-1/2" | 16 | 12 | 22 | 12 |
| 12 | 4-5/8" | 20 | 12 | 22 | 12 |
| 10 | 4" | 22 | 12 | 22 | 12 |

| TRIUM 10 | 31 | 34 | 36 | 40 | 43 | 50 | 56 | 60 | 66 | 70 | 76 | 82 | 97 | 100 | 103 |
|----------|--------|--------|--------|--------|----|--------|----|--------|----|--------|----|--------|--------|--------|--------|
| Inches | 12-3/8 | 13-3/8 | 14-1/4 | 15-3/4 | 17 | 19-3/4 | 22 | 23-3/4 | 26 | 27-1/2 | 30 | 32-1/4 | 38-1/4 | 39-3/8 | 40-1/2 |
| A | 14 | 14 | 14 | 14 | 14 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| B | 22 | 20 | 19 | 17 | 16 | 14 | 18 | 16 | 15 | 14 | 13 | 12 | 12 | 12 | 12 |
| Z | | | | | | | | | | | 28 | 29 | 30 | | |



For wide plant-to-plant spacing needed in planting hemp, growers are using every other cup.

For example, for 5' plant-to-plant spacing they set sprockets for 30 inches, (see chart) and then hit every other cup by putting in **cup covers**.

This chart below shows closer plant-to-plant spacing for vegetables. You will need a "15" sprocket under the carousel for these settings.

| | cm | 14 | 17 | 20 | 23 | 26 | 28 | 31 | 34 | 37 | 40 | 45 | 50 |
|--------|----|-------|-------|-------|--------|--------|----|--------|--------|--------|--------|--------|--------|
| Inches | | 5-1/2 | 6-3/4 | 7-7/8 | 9-1/16 | 10-1/4 | 11 | 12-3/8 | 13-3/8 | 14-5/8 | 15 3/4 | 17-3/4 | 19-3/4 |
| Z = | | 28 | 26 | 22 | 19 | 17 | 16 | 20 | 19 | 17 | 16 | 14 | 13 |

"15" sprocket under carousel

Z 14 Z 20

5) Ensure the machine is set/adjusted properly.

Here are some key points to consider (in order of importance) when putting our Trium or UniTrium models into the field:

The following 3 critical adjustments all contribute to helping us close the furrow created by the shoe by applying down pressure to our packing wheels.

5 A) 3-POINT LINKAGE -

The 3-point linkage must be either vertical (straight up) OR leaning slightly toward the transplanter (NOT leaning toward the tractor). With the transplanter leaning slightly away from the tractor we allow for *better down pressure on the packing wheels*.

There are different adjustments to help us close the furrow created by the shoe-- **This is the 1st of 3 ways** to do this in our checklist. Our goal is not only to close the furrow created by the shoe but also to pack the plant firmly into the ground straight up.



Here you see a slight ridge is created in the center of the row between the plants-- this shows the furrow created by the shoe is closed properly by the packing wheels.

5 B) DRIVE WHEELS -

The 2nd adjustment to help us close the furrow created by the shoe is to lower or raise the drive wheels so that our packing wheels are able to make firm contact with the soil.

A good barometer to look to when raising and lowering the drive wheels is the parallelogram.

Lower or raise the drive wheels to the point where the parallelogram (on each row - located close to the tool bar) is fairly level. Looking from the side view of our transplanter, it should be level horizontally. This way each row unit can float up and down and thus ensure a constant planting depth we desire. Its imperative that the drive wheels are in contact with the ground/soil - they must track because they drive the whole unit (through the hex shaft). **The drive wheels must follow the tractor wheels (be in-line with)**. Raising or lowering the drive wheels helps us level the parallelogram-- ideally the side view of the machine should be level.

5 C) DOWNPRESSURE SPRING FOR PACKING WHEELS--

The 3rd adjustment to help close the furrow created by the shoe is:

Slightly tighten the wing nut on the fat spring below the seat. In normal soil conditions, usually a few turns will be enough. The tighter the spring, the greater the down pressure on the packing wheels. If you tighten too tight you might create a large, deep furrow which is not recommended.



If all of your plants are not being placed in the ground, laying on top of the ground, or not packed straight up, then the likely adjustment is **TIMING**.

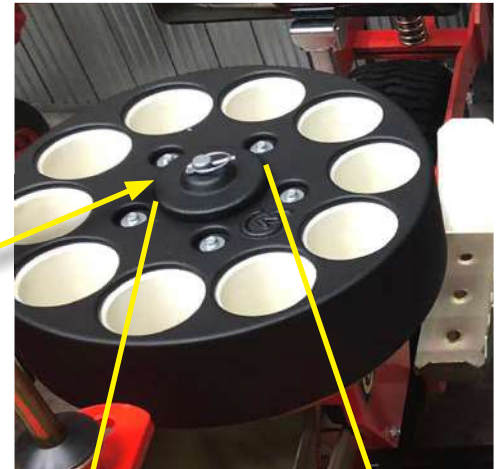
6) TIMING - critical*

Perhaps the most important adjustment on the machine is the **timing** - located on top/center of the carousel. BEFORE adjusting the timing, be sure that those sitting on the machine are comfortable with planting at your desired tractor speed. The speed has been ranging from approx 1-2 mph-- most common 1.2 mph. Going too fast means for those sitting on the machine they end up skipping (or missing) too many plants. The main thing is to set the timing AFTER you have decided on a comfortable speed for those seated on the machine placing plants in the cups.

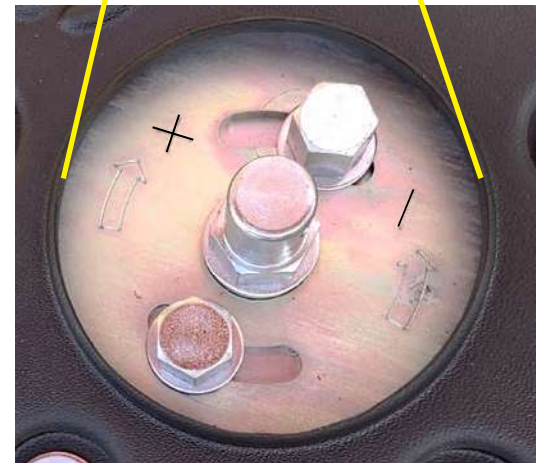
You gain access to our timing adjustment by removing the black cap at the center of our carousel, loosening the two nuts, and then tweaking or rotating the carousel slightly toward the plus or minus--engraved on top by the two nuts. Then tighten the nuts again.

When we talk of timing, our goal is to have the plant arrive at the bottom of the shoe and the moment it arrives it gets kicked out. If the plant arrives too late and the kicker is already forward (ahead) then the timing needs to be turned slightly toward the plus sign on top. If on the other hand, the plants are arriving too soon and the plants have to wait before being kicked out then you need to adjust the timing toward the minus sign on top. We have found that if the timing is off we like to adjust two rows towards the "+", and two rows towards the "-", to see which way gets us closer. Then we tweak it a little more until we have the "sweet spot" and we then adjust all the rows the same.

If you have plants laying on top of the ground then its timing. If all the plants are leaning a certain way then its timing. Please remember that its often just a slight - very slight - adjustment on top/center (with the two nuts) which results in a big change on the outside of the carousel.



10 cup carousel



If you have a 50-72 count hemp tray **this is very likely your "timing" setting** based on a speed of around 1.2mph.

OBJECTIVE: All plugs/plants should be planted straight up! If not, it's likely the timing setting.

If for any reason you can not achieve this objective then please call your dealer or text Grant at 208-520-8222.

Once you have set your timing note the speed. From then on, it is best to go from 0 to the desired speed on the tractor quickly so that the machine is in timing with the set speed. For example, if you set the machine's timing when going at 1.2mph, then each time you start try to go quickly to 1.2mph. You can speed up slightly, to 1.3mph with the timing set a 1mph without causing issues with the timing.



TIP--Place plants ONLY in cups near you.

If the row operator gets behind they might be tempted to put a plant in the furthest away cup to try to catch up. This will not plant properly. The furthest away carousel position is the OPEN hole to fall into the throat. If the plug/plant doesn't have time to go to the bottom of the cup, it will not be ready to go down the throat with the proper timing and will not stand up properly, or may be damaged.

7) PACKING WHEELS - Key Adjustments

Adjust the packing wheels - this first adjustment **(A)** is for **positioning them closer and further away** from the plant coming out of the shoe.

A common position is where the center of the big washer is around 1 & 3/4 mark. If it's sandy soil you should move them back (away from shoe) to around 1.

If it's clay soil, you can move it slightly forward (toward the shoe) to around 2. **Most soils work well with the 1 & 1/2 to 1 & 3/4 setting.**

The other adjustment **(B)** on the packing wheels is the notches on the side of the wheels to bring the wheels closer together, or further apart. A common setting for normal conditions is 3.5 holes each side. For sandy soil or bigger plants try 2.5 holes showing each side.



8) PLANT DEPTH -

Adjust the depth gauge - which lowers or raises the **packing wheels**. A common depth to start, for hemp, is around **5 to 6**, depending on the size of your plugs. You can adjust slightly according to how the machine is planting.

***NOTE:** Plants laying on top of the soil (even one out of every several plants, is not a function of depth, but rather **timing**-- See Timing Adjustment (item 6, page 7.)



depth gauge

9) FRONT PRESS WHEELS -

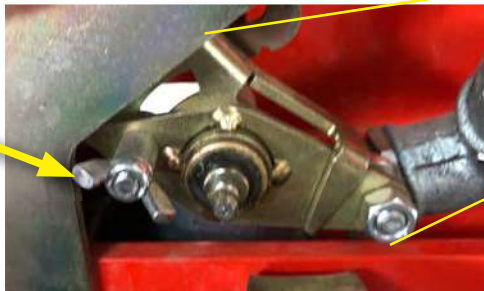
Adjust the front press wheels to where they touch and provide some compaction. A common setting is around 3 - but this can vary slightly.



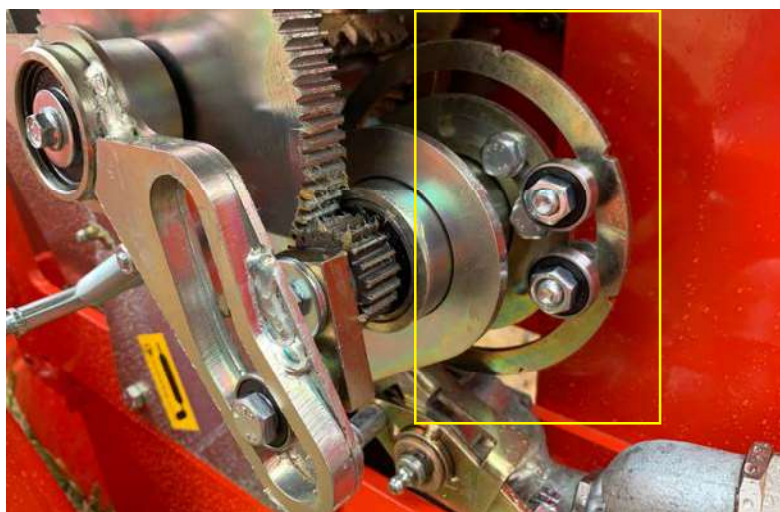
10) WATER -

If your machine has the water valves, be sure the water is hooked up to the valves on our machines. In addition to watering your plants, another advantage of the watering system is that it keeps your shoes cleaned out so it doesn't get clogged up with soil. (Otherwise see "Troubleshooting" on page 11).

The wing nut in this picture is for adjusting quantity of water per drop.



picture of water quantity adjustment

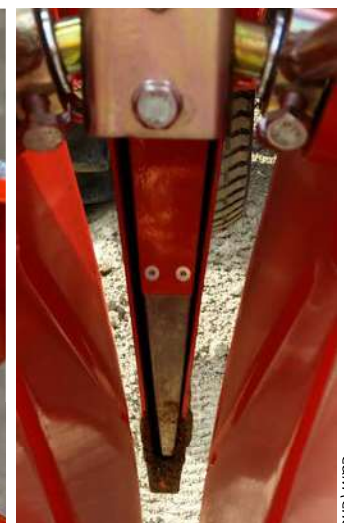
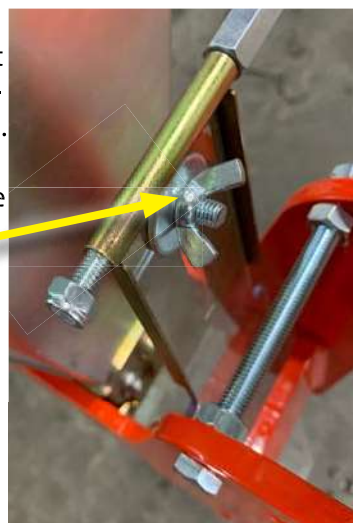


The factory adjusts the water timing-- properly set when the kicker is completely back in the shoe the moment it begins to move forward the water is release from the valve and comes down in the shoe and accompanies the plant as it is kicked out. In this way, the plant gets the water in needs.

However, if the water is consistently not hitting with the plant, then a slight adjustment is needed with the 2 bearings pictured here-- slightly adjust up or down.

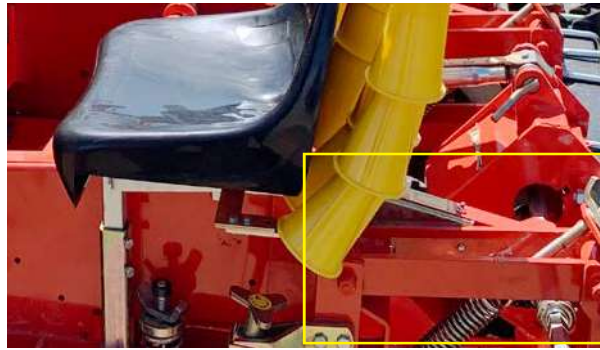
11) PLASTIC GUILLOTINE -

This is a clear plastic piece which helps each plant fall straight down the throat into the shoe without falling over in the process. Its motion is up and down every time a plant falls down. For tall plants (12" plus) you only need to lower it slightly, if at all. For short plants (4"-10") it helps if you lower the guillotine most of the way down--Do this by loosening the wing nut and sliding it down. This does not go into the soil but it does offer help to the plant as it falls down to help it stand straight up right before it is kicked out.



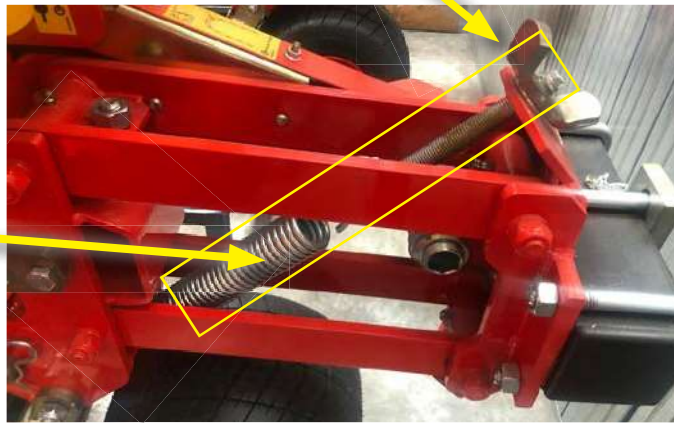
NOTE: When you change the shoe size, you change the guillotine size **and** the kicker size as well, which is included in the new shoe kit.

12) OPERATOR WEIGHT ADJUSTMENT SPRING--



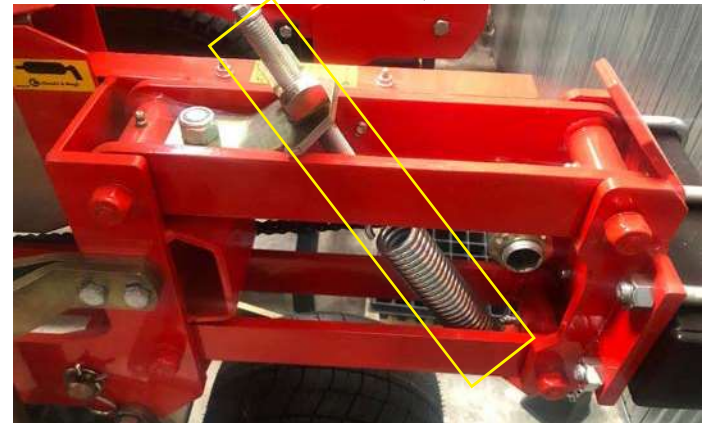
This setting is less critical, however if you notice that one row is digging a deeper trench it could be due to a **heavier operator weight** on that row.

To adjust this, **tighten the spring wing nut behind the seat** near the tool bar to relieve some of the operator weight on the effected row.



The best ways to apply and adjust **down pressure on the packing wheels** is to refer to page 4 and do all 3 critical adjustments to the packing wheels (4-A, 4-B, 4-C.) If after doing those adjustments you still need more down pressure you can try this option below.

If your ground is hard and you want to **apply more down pressure**, on the row unit (for tighter packing) then you can simply **reverse this spring in which now applies more down pressure.** (This option is rarely utilized.)



In the end, all of these adjustments work in your favor - and once you set them you should not have to reset them again and again. They will always work the same as long as everything stays relatively the same - speed, soil, plants, etc.

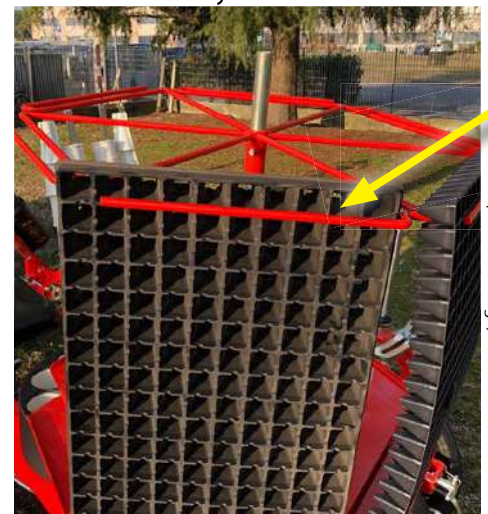
TRAY STORAGE -

Make sure the tray storage is being utilized - most of the machines have the **double or triple horizontal racks** and so they have an impressive rack storage capacity.

If you have a 4 or 6-sided **rotary tray holder**, do you use soft trays or hard trays? If you use soft or flex trays, you will need to change the top part of the tray holders out for the top piece shown in the picture below which is for soft trays. (*adjustable height*)

Standard Hard Tray Holder

6-Sided Soft Tray Holder Attachment



C&M (Chech & Magli) North America © 2020

Keep Your Transplanter Performing!

Especially during your intense transplanting time it is important to grease/oil it every 50 hours. (2019 model)

Also, **spray oil on the kicker bearing EVERY DAY during transplanting!** It is constantly moving and close to the dirt dust as you transplant-- it is critical to oil it once daily during transplanting. Check the springs during this daily oiling process.



If you are not applying water with our "water trip" feature, then you need to be sure that every time you reload trays, lift the machine and clean out each shoe behind the kicker with the "clean out rod" to remove extra soil which may have

NEW TRIUMS, the 2020 model, no longer have a kicker bearing, however all previous models do. (See page 5.)



TROUBLESHOOTING--

If all the timing positions are set exactly the same and it's working great - and then after a while **one row begins to act up (no longer planting correctly)** then it's usually one of two things -

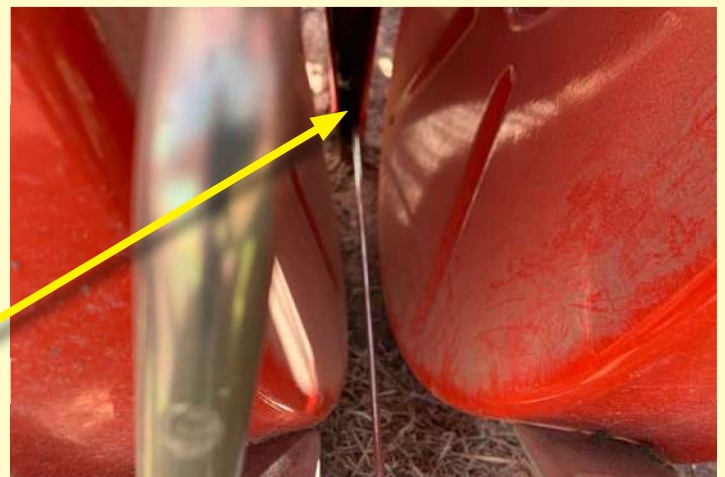
1) **A plant is stuck in the throat** of that row unit and thus affecting the fall of all the plants down that throat (solution = remove the stuck plant)

OR

2) Soil has accumulated behind the kicker and is affecting the kicker of that row unit. This is the reason for which the shoes must be cleaned out (if they are NOT using water - if they are using water then the water will clean out the shoe every time a plant comes down). If you are not using water, you can imagine as each plant drops down the throat into the shoe it can lose a little soil and over time that can accumulate in the back of the shoe and affect the performance of the kicker. So when the farm stops to reload the trays on the racks, one person should be assigned to **clean out the shoes**. We have seen damage caused to the kicker by not cleaning out the shoes.



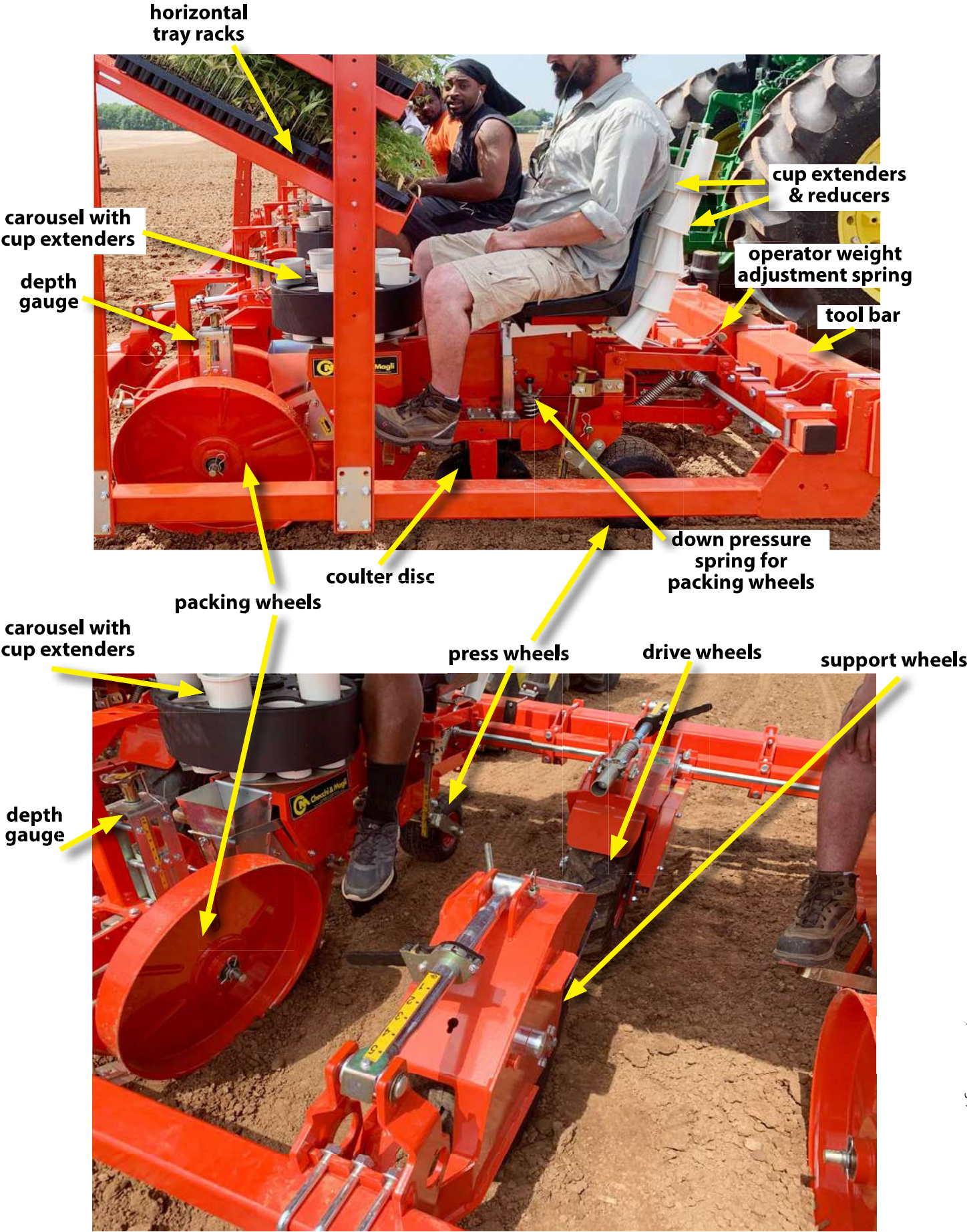
Clean-out rod to clean out soil/debris from throat and shoes.



3) If all the plants are not going in the ground straight up, or some are not going into the ground at all, **that is a TIMING issue**. (See page 7)

4) If the furrow made by the shoe is not closing-- (see page 6, Items 5A, 5B and 5C)

TRIUM or Unitrium-- Part Names & Locations



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