2022 Perth SCIA Compaction Event

Rostock, Ontario

August 4-5th, 2022

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Perth SCIA Compaction Event

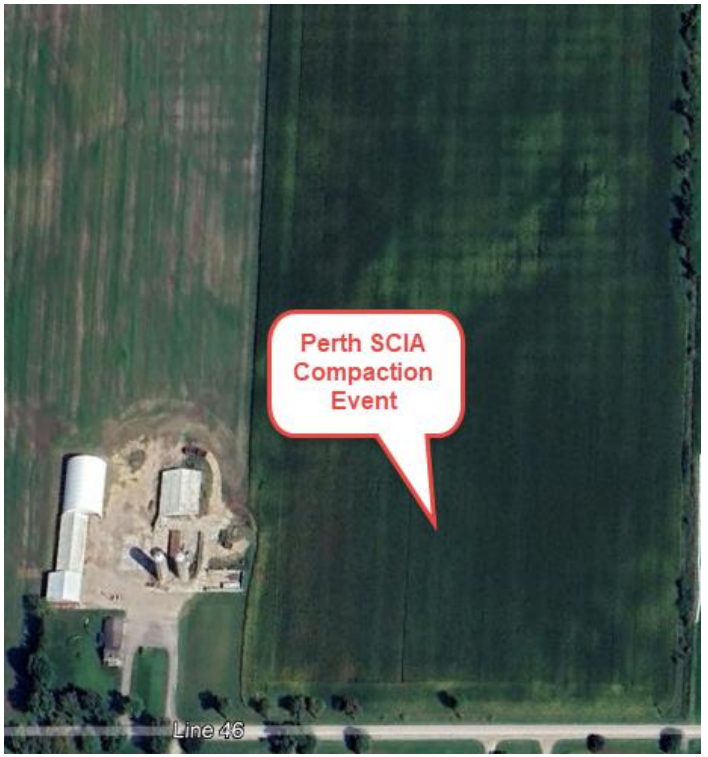
- Prior to the event, water was applied to the soil via four 1000L totes arranged in a square with holes drilled in the bottom.
- The area watered needed to be longer and wider than any individual track or tire tested since the wetness was hoped to be uniform within this area for correct sensing.
- Water was applied several times to mimic spring or fall soil conditions on the dry surface of the wheat stubble. It is not known how uniform the soil wetness was throughout the soil profile used in the sensing demonstration
- All equipment was cataloged and weighed by each wheel/track on day 1 and run over the sensors on day 2.
- Sensors were installed at depths of 6”, 12”, 20” using a custom designed apparatus. At the time of installation we do not know definitively if the above depths are correct, but when the sensors are uninstalled we check the depth and they have been within 1” for each depth at each event.
- Sensors were connected to a large display screen to share the real time response of each piece of equipment detected by the sensors and was recorded for later reporting.
- Sensors were measuring pressure detected at each depth.
- Pressure is used as a proxy to compaction susceptibility and is not a direct measure of soil compaction.

Site Soil Details

- The soil at the site was a primarily a Perth Clay Loam (40-55% clay)
- See next page for details.

Ontario Soils Maps – OMAFRA Agmaps

Site Layout



https://www.lioapplications.lrc.gov.on.ca/AgMaps/Index.html?viewer=AgMaps.AgMaps&locale=en-CA

Site Soil Details (cont.)

(b) *Imperfectly Drained*

Perth clay loam (112,500 acres)
Perth silt loam (49,900 acres)

Although Perth soils are imperfectly drained the profile exhibits sufficient Grey-Brown Podzolic characteristics to be included with that group.

The following is a generalized profile description of Perth clay loam occurring under virgin conditions.

A_0 — Accumulated layer of partially decomposed litter from deciduous trees.

A_1 — 0–6 inches very dark grey (10 YR 3/1) clay loam; fine granular structure; friable consistency; occasional stones; pH — 6.9.

A_2 — 6–10 inches light yellowish brown (10 YR 6/4) clay loam; mottled; weak platy structure; friable consistency; pH — 6.8.

B — 10–17 inches dark brown (10 YR 4/3) clay; mottled coarse blocky structure; hard consistency when dry, plastic when wet; few stones; pH — 7.0.

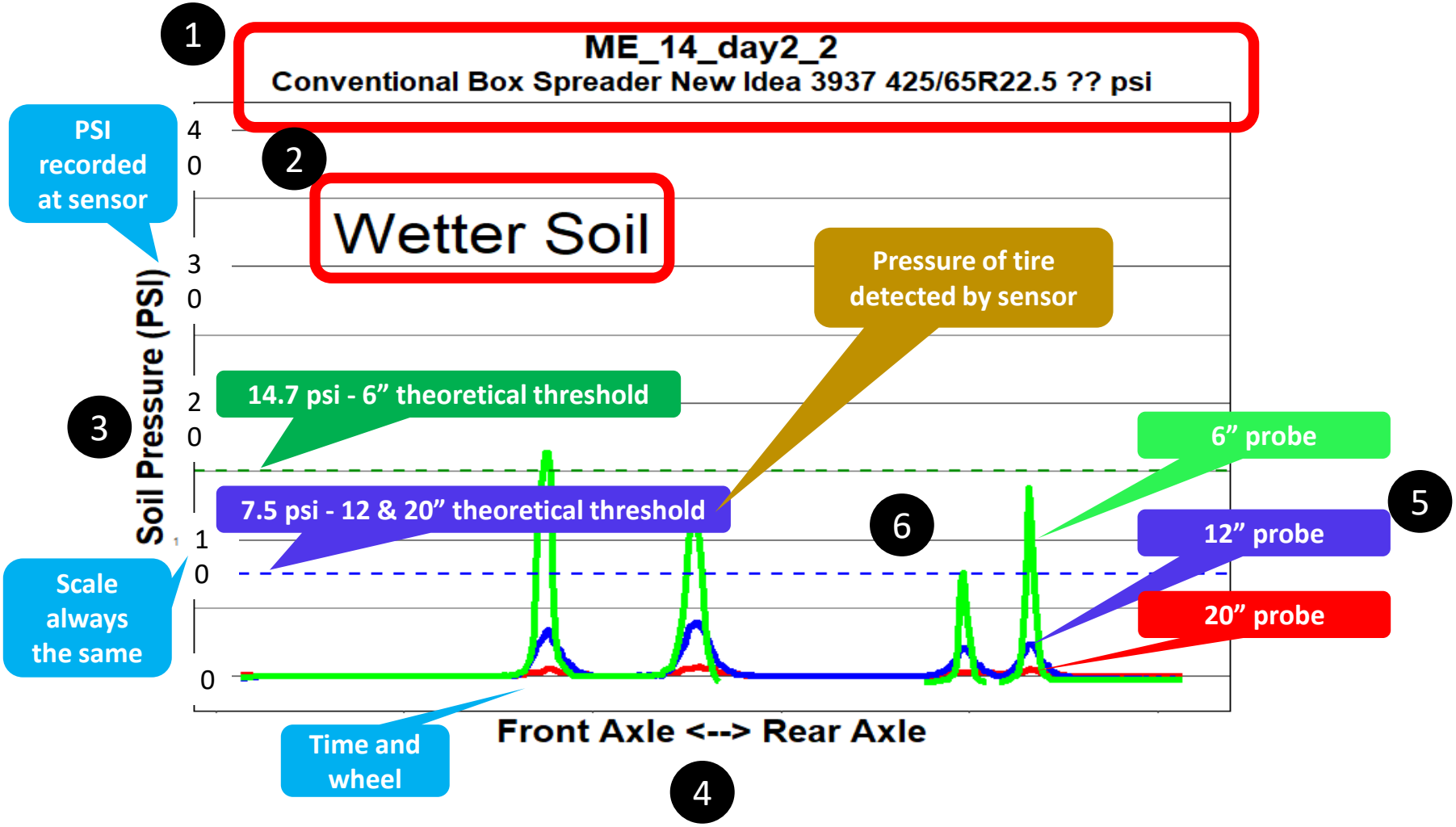
C — Pale brown (10 YR 6/3) clay; fragmental structure; hard consistency when dry, plastic when wet; few to frequent stones; pH — 7.8.

https://sis.agr.gc.ca/cansis/publications/surveys/on/on15/on15_report.pdf

Interpreting the Data

- The data collected at these events is not rigorously collected scientific data but its aggregation shows trends that can direct us in the correct path to lower our risk of soil compaction.
- But it is more than simple “demonstration”!
- The data from an individual equipment pass should not be used for decision making.
- For a typical event, the team weighs and senses each piece of equipment. Multiple sets of Wet/Dry pits are prepared and used depending on how well the soil in the trafficked pits resists the stress. Thus different pieces of equipment or even the same equipment may have been tested on different sets of sensor pits and our experience has shown that we often get significant differences in response from the same equipment across different sensors located within as close as 30 feet of each other, and 30 feet is the distance we select to allow safe traffic flow around pits when preparing for an event.
- The other important variable to be aware of is that our sensor at the end of the pressure tubes is only 6” long, such that we may miss being directly over the critical sensing part of the sensor when an individual piece of equipment passes over. We try to ensure that any passes that are obviously not correct are abandoned and not included in the data.
- Refer to our overall Soil Compaction Event Learnings document for the aggregate determination of trends from all of the compaction events.

Typical Layout of Response Charts



Understanding the Charts

- Referring to the diagram on the page above, all exhibits receive a similar chart
- To support your interpretation of the exhibit, the charts are organized as follows:
    1. Title at the top that gives a brief description of the setup tested.
    2. Indicates whether the data is from a “Wet” or “Dry” pit, where the wet is one that has been watered and the dry is that condition of the field as it is.
    3. “Soil Pressure” in “Pounds per Square Inch” (PSI) is measured on the “Y” axis.
    4. Time/axle is measured on the “X” axis, and should be read from left to right, so the most left set of curves will be the first wheel to cross the sensor, usually the front wheel of the power unit, but not always since sometimes the front wheel is missed or mostly missed in lining up the rear dual of a tractor.
    5. The pressure response from the sensors to the travel of the tires over the sensor are “Green=6”, Blue=12” and Red=20” sensor”.
    6. From European work for a “general soil” there, scientists have estimated that 14.7 PSI is the theoretical threshold for which pressure should be below at the 6” depth (note dotted **GREEN** Line), and below 7.5 PSI at the 12” and 20” depths (note dotted **BLUE** Line). We have not validated those thresholds in Ontario but having them there offers the viewer an indication of the severity of compaction potential associated with a given configuration of equipment.

- **CAUTION – some of the equipment may not have directly navigated over the sensors, do not use an individual set of response curves as the definitive answer as to whether the observed equipment configuration is more or less prone to causing soil compaction**

Important Reminder

- Soil Compaction Events conducted by OSCIA and other event coordinators in cooperation with the Ontario Soil Compaction Team, **are not a COMPETITION!**
  - The equipment used in the events made possible from committee members, individual farmers and equipment sponsors are a platform to test various configurations of equipment
  - All of the platforms used can have similar configurations outfitted on them.
  - Any power unit or towed implement can be configured to lessen the risk of soil compaction.
  - Users of this information are encouraged to engage with others in finding the best solutions to their particular situations.

Key Learnings

- To lower the threat of soil compaction the compaction events have identified the following learnings:
  - Dryer soil is less susceptible to soil compaction than wet!
  - Lighter equipment is less likely to cause compaction compared to heavier equipment.
  - The more of (axles, duals, triples) and the better quality of tires (VF>IF>Radial>>>Bias) that are available on a piece of equipment that can operate at lower tire pressures will reduce the risk of soil compaction.
  - Where significant loads are carried routinely over roads and fields, Central Tire Inflation Systems (CTIS) are an important consideration to optimize tire pressure for the situation and therefor equipment operation to minimize the potential for soil compaction.
  - Compromising on tire pressure regarding road and field recommendations is highly discouraged, it just leads to trouble!
  - Tracks can be a good option where increasing tire size/number is not possible, BUT, you have to consider the cost, extra weight, extra maintenance that often come with converting to tracks.
  - Additionally with tracks, there is no doubt that they can go through more tough conditions BUT if they are carrying similar total and axle weight to a wheeled option, they run the same risk of soil compaction, if not worse because of tearing up the soil more than would happen when you elected not to put a wheeled piece of equipment in the field because the conditions were too marginal.

Addressing Soil Compaction

There are many ways to protect yourself from soil compaction. Compaction is not a moment in time issue. Avoiding compaction in the moment and being set to buffer against compaction is an ongoing management challenge but implementing some or all of the below is a good way to start!

1. Tile Drainage
2. Build Better Soils
3. Avoid Wet Soils
4. Bigger Tires
5. Lower Tire PSI
6. Use Inflation/Deflation Systems
7. Better Tires
8. More Tires/Axles
9. Less Passes
10. Less Tillage
11. Control Traffic
12. Lower Load Weights
13. Choose configurations carefully
14. Be Patient

The management decisions listed that can reduce soil compaction are in no particular order.

2022 Perth SCIA Compaction Event

Exhibit: P01
Case 8230 Combine Dual 520/85R42 Front & 600/65R28 Rear


CASE IH
AXIAL-FLOW
CASE IH

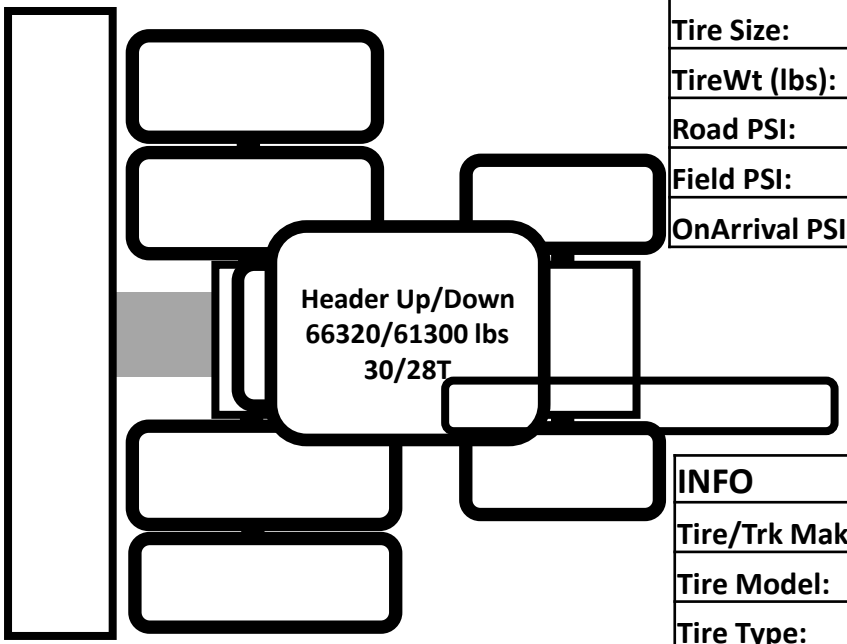
Exh#:	P1	ExhNote:		AB-diff psi, LR-diff tires, W1W2-diff wts
ExhName:		OwnerName:	Fred Knechtel	Phone#:
EquipType:	Combine	Make:	CaseIH	Model: 8230

INFO	Inside	Outside
Tire/Trk Make:	Firestone	Firestone
Tire Model:	Radial all Traction	
Tire Type:	Radial	Radial
Tire Size:	520/85R42	520/85R42
TireWt (lbs):	12020/9640	11140/8900
Road PSI:		
Field PSI:	28	
OnArrival PSI	29	25

66320/61300 total lbs header up/down
30/28T total

INFO	Inside	Outside
Tire/Trk Make:	Firestone	
Tire Model:	All Traction	
Tire Type:	Radial	
Tire Size:	600/65R28	
TireWt (lbs):	8400/10780	
Road PSI:		
Field PSI:	34	
OnArrival PSI	24	

In tire weight cells header up/header down differential weights



INFO	Inside	Outside
Tire/Trk Make:	Firestone	Firestone
Tire Model:	Radial all Traction	
Tire Type:	Radial	Radial
Tire Size:	520/85R42	520/85R42
TireWt (lbs):	12620/10220	13420 /10660
Road PSI:		
Field PSI:	28	
OnArrival PSI	29	29

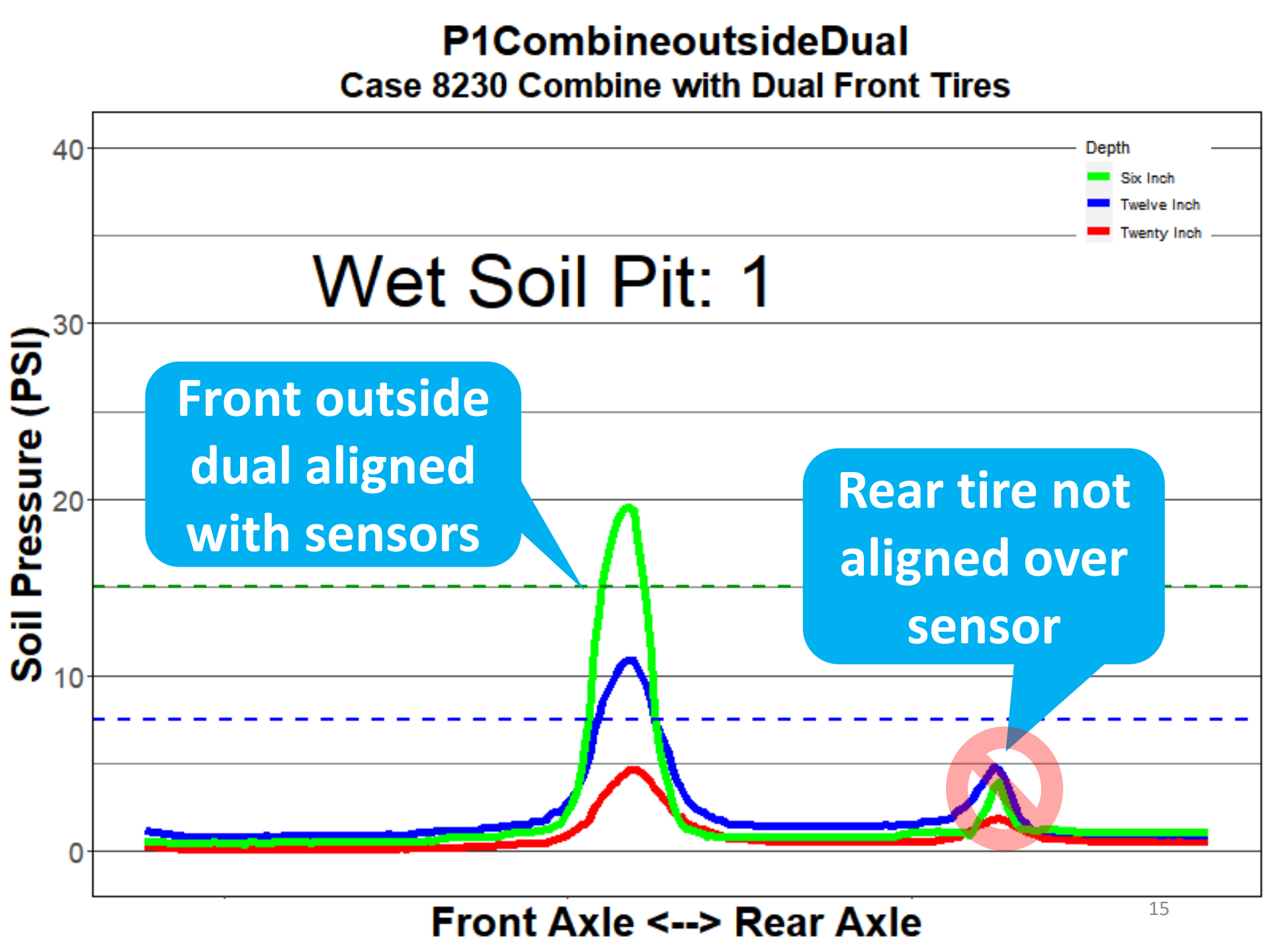
INFO	Inside	Outside
Tire/Trk Make:	Firestone	
Tire Model:	All Traction	
Tire Type:	Radial	
Tire Size:	600/65R28	
TireWt (lbs):	8720/11100	
Road PSI:		
Field PSI:	34	
OnArrival PSI	24	

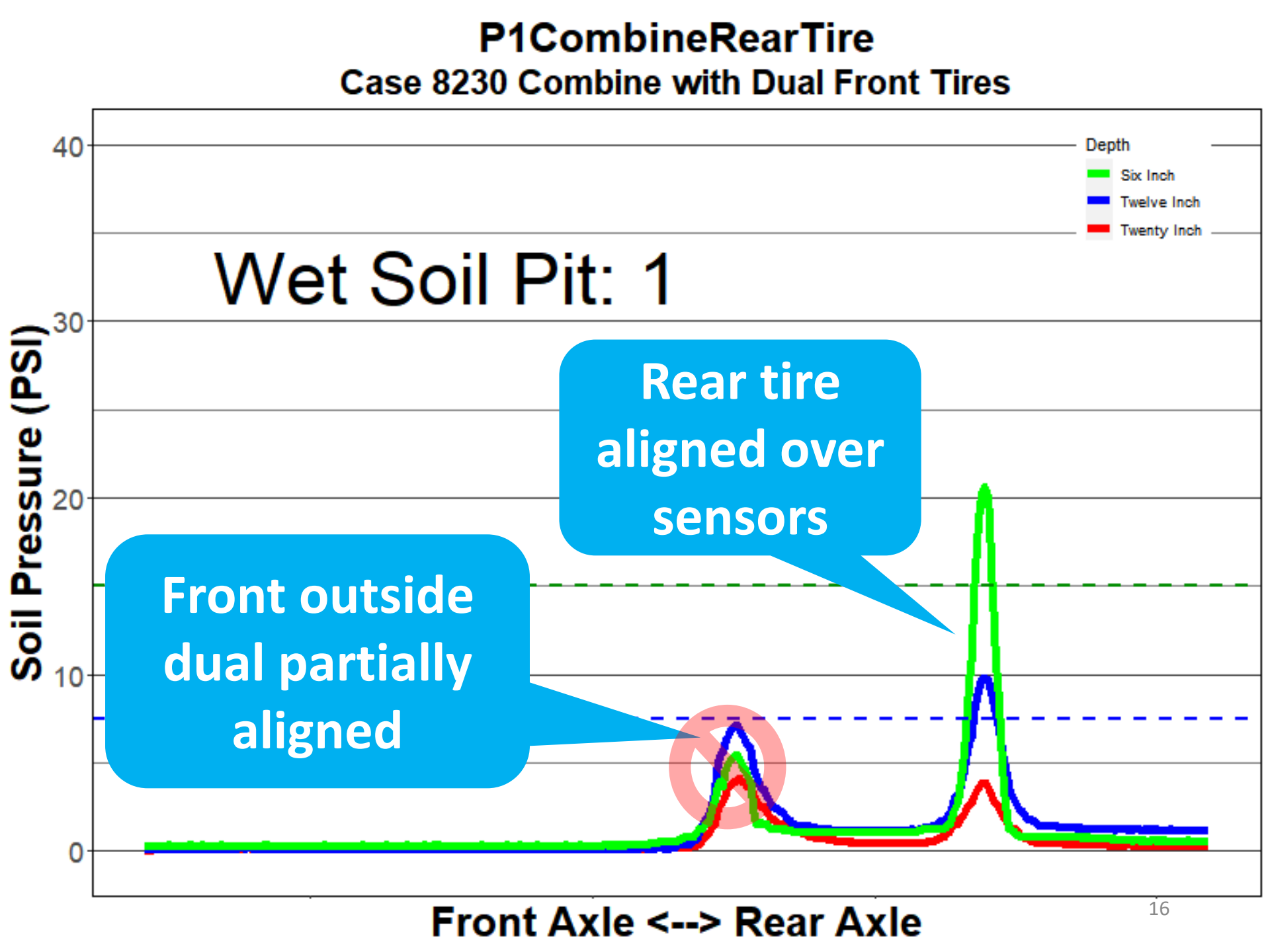
Combine - Wheeled

Empty or Loaded?

Header On: Yes / No

CTIS: Yes / No?


P1CombineoutsideDual
Case 8230 Combine with Dual Front Tires
Depth
Six Inch
Twelve Inch
Twenty Inch
Wet Soil Pit: 1
Front outside dual aligned with sensors
Rear tire not aligned over sensor
Soil Pressure (PSI)
40
30
20
10
0
Front Axle <--> Rear Axle


P1CombineRearTire
Case 8230 Combine with Dual Front Tires
Depth
Six Inch
Twelve Inch
Twenty Inch
Wet Soil Pit: 1
Rear tire aligned over sensors
Front outside dual partially aligned
Soil Pressure (PSI)
40
30
20
10
0
Front Axle <--> Rear Axle

Plot Comments – P01

- In the first graph, the outside front dual was properly aligned over the sensor showing typical soil depth pressure response from combines
- In this graph, the rear tire was not correctly aligned and doesn’t read correctly.
- In the second graph, the rear tire is properly aligned to the sensors and is the expected response while the front outside dual is not centred on the sensors.
- This is a typical response from a good combine configuration.


8230
CASE IH


8230
CASE IH


CASE IH

2022 Perth SCIA Compaction Event

Exhibit: P02+P03

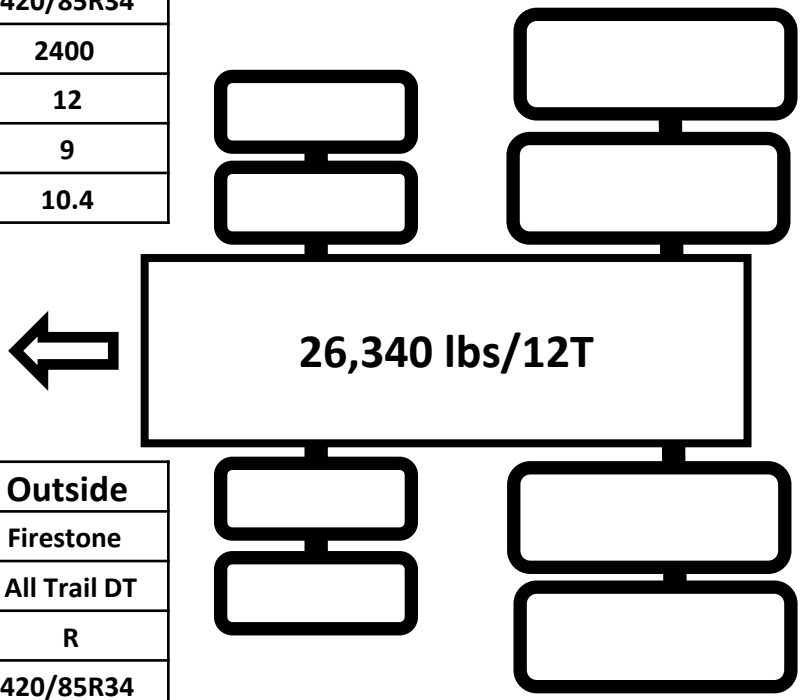
Case Magnum 290 Dualled 420/85R34 Fr-480/80R50 Rr + J&M 760 Gravity Wagon w 455 Radials


CASE
290
MAGNUM
J&M

Exh#:	P2	ExhNote:	+P3		AB-diff psi, LR-diff tires, W1W2-diff wts
ExhName:		OwnerName:	Fred Knechtel	Phone#:	
EquipType:	RC Tractor	Make:	CIH	Model:	Magnum 290

INFO	Inside	Outside
Tire/Trk Make:	Firestone	Firestone
Tire Model:	All Trail DT	All Trail DT
Tire Type:	R	R
Tire Size:	420/85R34	420/85R34
TireWt (lbs):	3800	2400
Road PSI:	12	12
Field PSI:	9	9
OnArrival PSI	19.3	10.4

INFO	Inside	Outside
Tire/Trk Make:	Firestone	Firestone
Tire Model:	R	R
Tire Type:	DT23	DT23
Tire Size:	480/80R50	480/80R50
TireWt (lbs):	4700	3120
Road PSI:	9	9
Field PSI:	6	6
OnArrival PSI	20.2	9.6



INFO	Inside	Outside
Tire/Trk Make:	Firestone	Firestone
Tire Model:	All Trail DT	All Trail DT
Tire Type:	R	R
Tire Size:	420/85R34	420/85R34
TireWt (lbs):	3840	2180
Road PSI:	12	12
Field PSI:	9	9
OnArrival PSI	19.2	10.4

INFO	Inside	Outside
Tire/Trk Make:	Firestone	Firestone
Tire Model:	R	R
Tire Type:	DT23	DT23
Tire Size:	480/80R50	480/80R50
TireWt (lbs):	4000	3300
Road PSI:	9	9
Field PSI:	6	6
OnArrival PSI	20	9.8

Row Crop Tractor - Wheeled

CTIS: Yes / No?

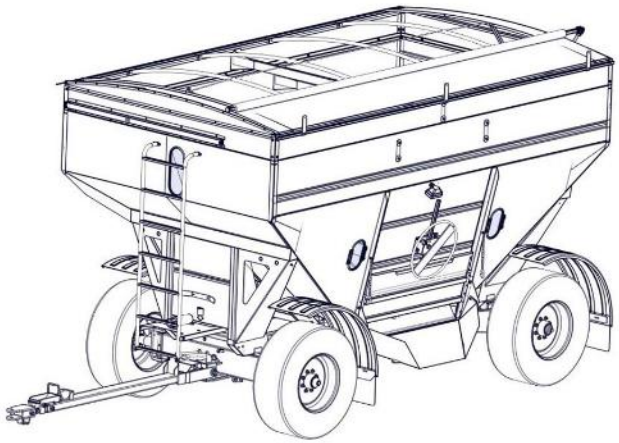

760
J&M
J&M
HORST

Exh#:	P3	ExhNote:	+P2		AB-diff psi, LR-diff tires, W1W2-diff wts
ExhName:		OwnerName:	Fred Knechtel	Phone#:	
EquipType:	Grain (Gravity) Wagon	Make:	J&M	Model:	760

INFO	Inside	Outside
Tire/Trk Make:	Double Star	
Tire Model:	DSR 588	
Tire Type:	R	
Tire Size:	455/65R22.5	
TireWt (lbs):	13380	
Road PSI:	130	
Field PSI:		
OnArrival PSI	96	

INFO	Inside	Outside
Tire/Trk Make:	Double Star	
Tire Model:	DSR 588	
Tire Type:	R	
Tire Size:	455/65R22.5	
TireWt (lbs):	12870	
Road PSI:	130	
Field PSI:		
OnArrival PSI	96	

Empty or Loaded?



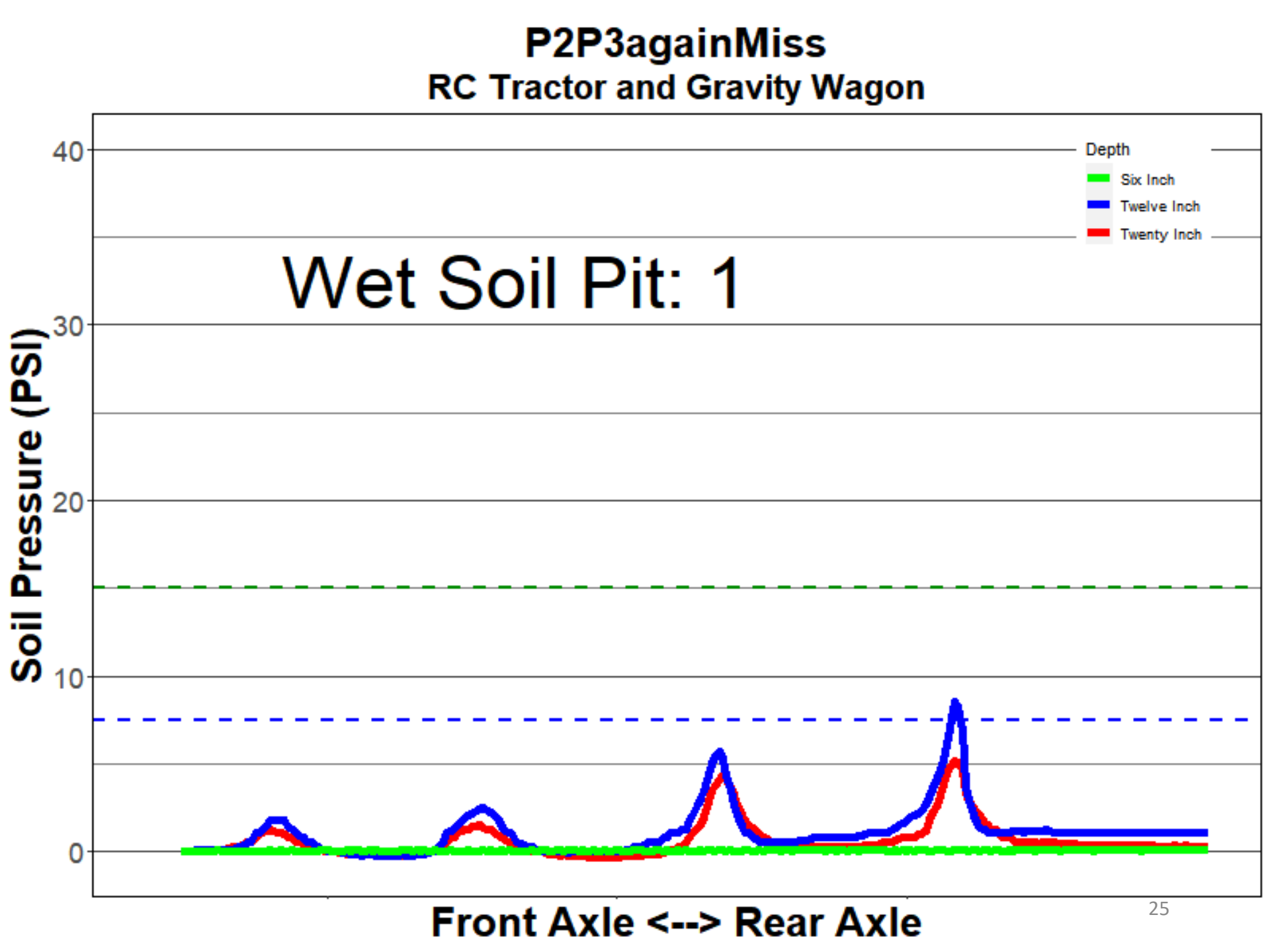
INFO	Inside	Outside
Tire/Trk Make:	Double Star	
Tire Model:	DSR 588	
Tire Type:	R	
Tire Size:	455/65R22.5	
TireWt (lbs):	13640	
Road PSI:	130	
Field PSI:		
OnArrival PSI	97	

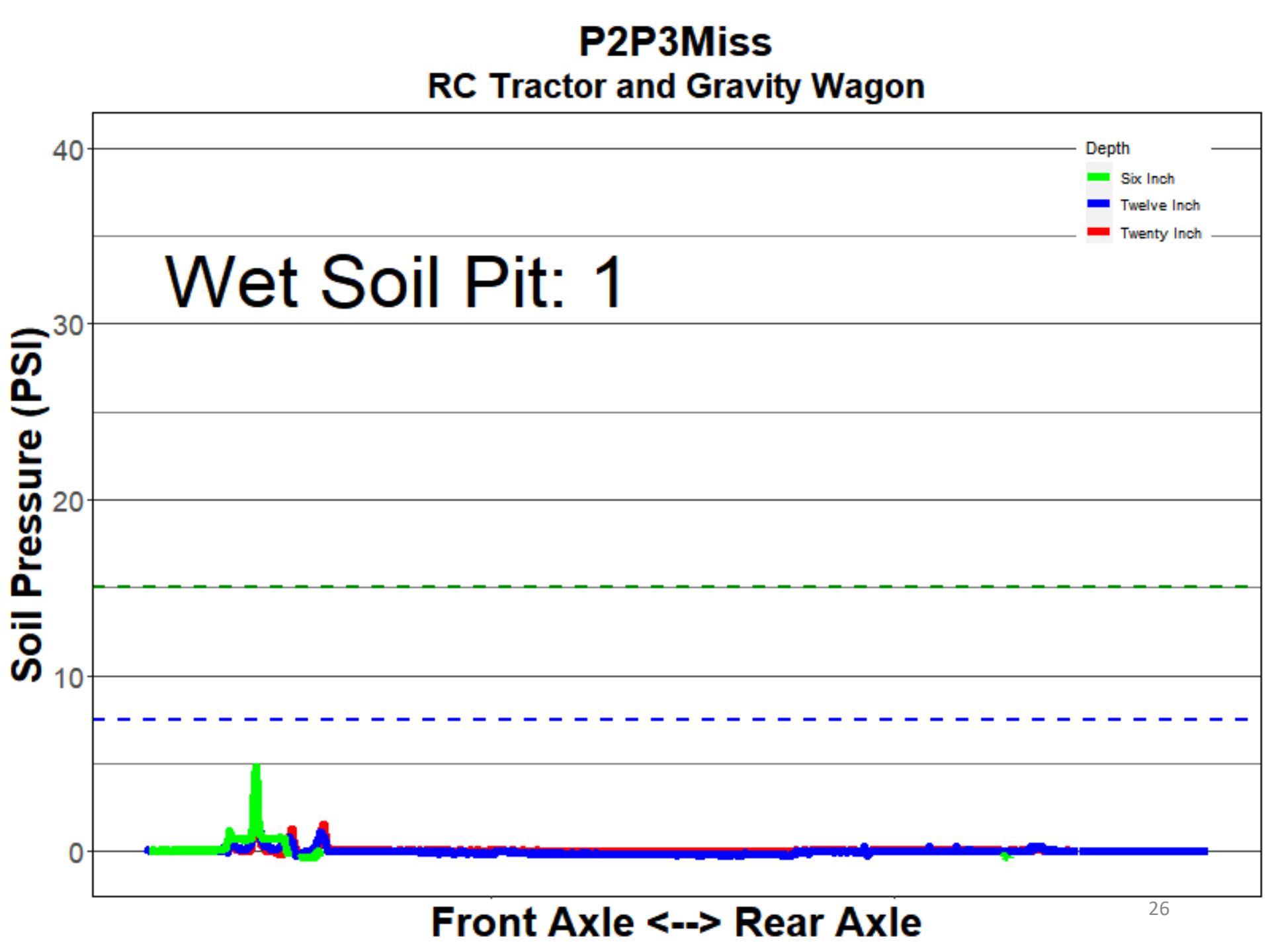
Total Weight
52,650 lbs
24 T

INFO	Inside	Outside
Tire/Trk Make:	Double Star	
Tire Model:	DSR 588	
Tire Type:	R	
Tire Size:	455/65R22.5	
TireWt (lbs):	13640	
Road PSI:	130	
Field PSI:		
OnArrival PSI	97	

Gravity Wagon

CTIS: Yes / No?


P2P3againMiss
RC Tractor and Gravity Wagon
Depth
Six Inch
Twelve Inch
Twenty Inch
Wet Soil Pit: 1
Soil Pressure (PSI)
40
30
20
10
0
Front Axle <--> Rear Axle


P2P3Miss
RC Tractor and Gravity Wagon
Depth
Six Inch
Twelve Inch
Twenty Inch
Wet Soil Pit: 1
Soil Pressure (PSI)
40
30
20
10
0
Front Axle <--> Rear Axle

Plot Comments – P02+P03

- This was the final configuration tested
- The wheels cut so deeply into the soil that they broke the 6” sensor and damaged the others.
- Its is obvious from the pictures following this summary, that a loaded gravity wagon with 455 tires at 130 psi should not be moving loaded anywhere in the field other than the entranceway.
- Similar configurations at other events proved this point.


CASE IH
290
MAGNUM


J&M
700


CASE IH
290


J&M
J&M
Market
760


CASE


J&M
760
J&M


J&M

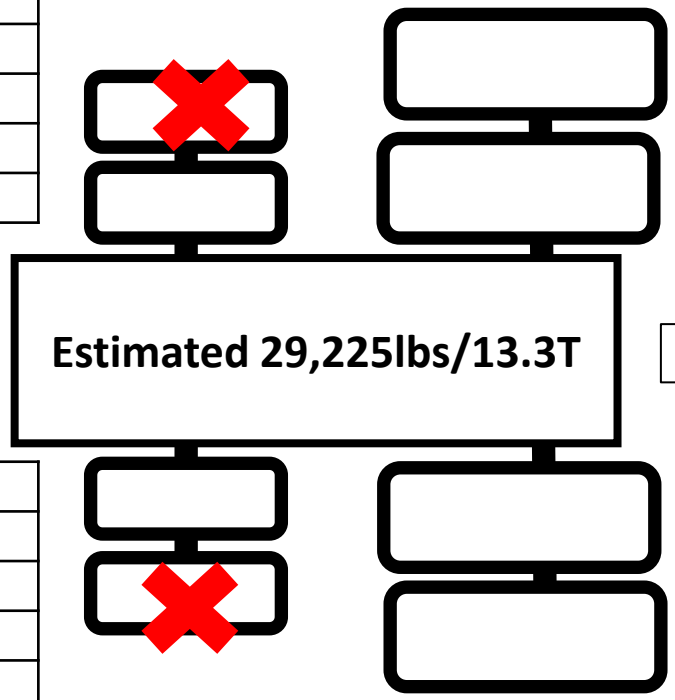
2022 Perth SCIA Compaction Event

Exhibit: P04+P05
John Deere 8285R+Bent 1396 Grain Cart w Equalizer Tracks

Exh#:	P4	+P5		AB-diff psi, LR-diff tires, W1W2-diff wts
ExhName:		OwnerName:	John McDonnell	Phone#:
EquipType:	RC Tractor	Make:	JD	Model: 8285R

INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Omnibib	
Tire Type:	R	
Tire Size:	480/70R34	
TireWt (lbs):	4263	
Road PSI:	15	
Field PSI:	6.5	
OnArrival PSI	24	

INFO	Inside	Outside
Tire/Trk Make:	Michelin	Michelin
Tire Model:	Agribib	Agribib
Tire Type:	R	R
Tire Size:	520/85R46	520/85R46
TireWt (lbs):	5175	5175
Road PSI:	12	12
Field PSI:	6	6
OnArrival PSI	11.5	11.5



stimated 8,525lbs

Estimated 20,700lbs

INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Omnibib	
Tire Type:	R	
Tire Size:	480/70R34	
TireWt (lbs):	4262	
Road PSI:	15	
Field PSI:	6.5	
OnArrival PSI	24	

INFO	Inside	Outside
Tire/Trk Make:	Michelin	Michelin
Tire Model:	Agribib	Agribib
Tire Type:	R	R
Tire Size:	520/85R46	520/85R46
TireWt (lbs):	5175	5175
Road PSI:	12	12
Field PSI:	6	6
OnArrival PSI	11.5	11.5

Row Crop Tractor - Wheeled

CTIS: Yes / No?

Exh#:	P5	ExhNote:	+P4		AB-diff psi, LR-diff tires, W1W2-diff wts
ExhName:		OwnerName:	John McDonnell	Phone#:	
EquipType:	Grain Buggy		Make: Brent	Model:	1396

INFO	Track
Tire/Trk Make:	Equalizer
Tire Model:	
Tire Type:	
Tire Size:	42” x 148”
TireWt (lbs):	43120
Road PSI:	NA
Field PSI:	NA

“Equalizer” Tracks

42 x 148 inch
Est. 42,120 lbs

NOTE: We were unable to weigh this combination because of the tracked buggy. This unit was weighed over truck scale so track weights are estimates!

Estimated Weight
86,240lbs/39T

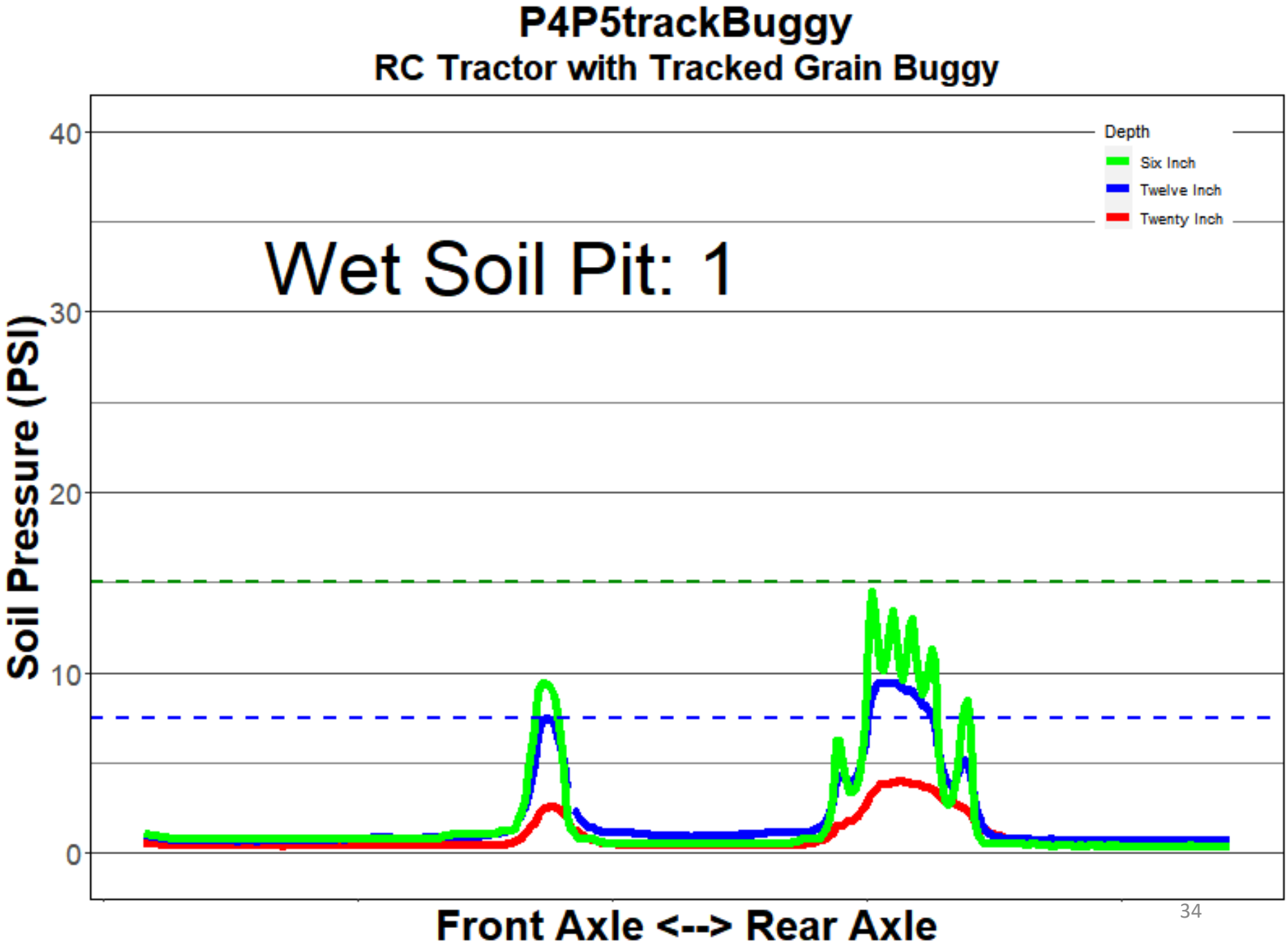
42 x 148 inch
Est. 42,120 lbs

INFO	Track
Tire/Trk Make:	Equalizer
Tire Model:	
Tire Type:	
Tire Size:	42” x 148”
TireWt (lbs):	43120
Road PSI:	NA
Field PSI:	NA

Grain Buggy - Tracked

Empty or Loaded?

CTIS: Yes / No?


P4P5trackBuggy
RC Tractor with Tracked Grain Buggy
Wet Soil Pit: 1
Depth
Six Inch
Twelve Inch
Twenty Inch
Soil Pressure (PSI)
40
30
20
10
0
Front Axle <--> Rear Axle

Data Comments – P04+P05

- The left response is the rear outside dual of the tractor
- The tractor was a good configuration for the load and the field conditions since it remained below theoretical threshold for all depths (green and blue lines at 15 and 7.5 PSI.
- The track also is a good configuration for the load and conditions. The response at 6” is below threshold and shows all the main and boggy wheels distinctly crossing the sensors
- The 12” depth response doesn’t show the individual wheels and they are almost invisible at 20” suggesting the load is acting as one solid force at this point.
- This is an excellent setup for fall harvest. A reasonable sized grain buggy on a large track setup reduces the potential for soil compaction.


BRENT
Equalizer

2022 Perth SCIA Compaction Event

Exhibit: P07+P08

Case Optum 300 RC Tractor + Nuhn Magnum 5000 Tandem Manure Spreader with Tire Size and CTIS Differences

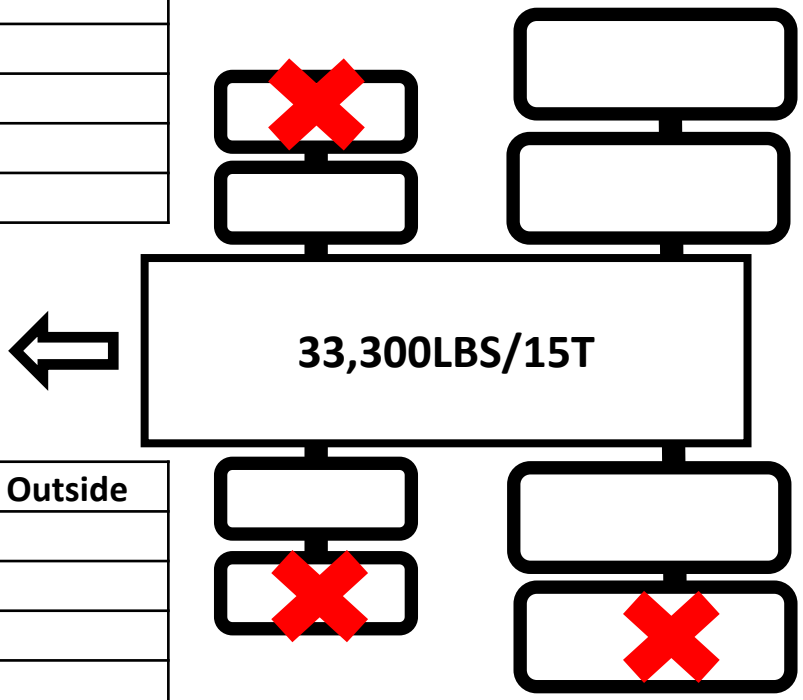

Deflated!


Inflated!

Exh#:	P7	ExhNote:	P8	AB-diff psi, LR-diff tires, W1W2-diff wts	
ExhName:	Agribrink	OwnerName:	Jake Kraayenbrink	Phone#:	
EquipType:	RC Tractor	Make:	CaseIH	Model:	Optum 300

INFO	Inside	Outside
Tire/Trk Make:	Firestone	
Tire Model:	Maxi Traction	
Tire Type:	VF	
Tire Size:	650/60R34	
TireWt (lbs):	4740	
Road PSI:	29	
Field PSI:	9	
OnArrival PSI	NA	

INFO	Inside	Outside
Tire/Trk Make:	Michelin	Michelin
Tire Model:	Agribib	Agribib
Tire Type:	R	R
Tire Size:	480/95R50	480/95R50
TireWt (lbs):	7460	5200
Road PSI:	25(9)	25(9)
Field PSI:	6	6
OnArrival PSI	NA	NA



INFO	Inside	Outside
Tire/Trk Make:	Firestone	
Tire Model:	Maxi Traction	
Tire Type:	RVF	
Tire Size:	650/60R34	
TireWt (lbs):	5300	
Road PSI:	29	
Field PSI:	9	
OnArrival PSI	NA	

INFO	Inside	Outside
Tire/Trk Make:	Firestone	
Tire Model:	Maxi Traction	
Tire Type:	VF	
Tire Size:	900/60R42	
TireWt (lbs):	10600	
Road PSI:	29	
Field PSI:	9	
OnArrival PSI	NA	

Row Crop Tractor - Wheeled

CTIS: Yes / No?


Inflated!


Deflated!

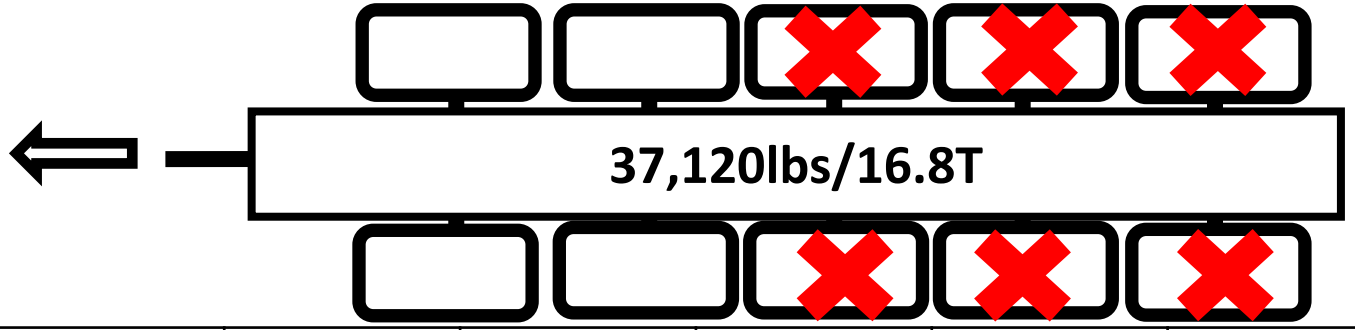

Inflated!


Agri Brink
A.A.I.D. Control
519-630-0519
www.Agribrink.com
MAGNUM
NUHN
Deflated!

Exh#:	P8	ExhNote:	+P7	AB-diff psi, LR-diff tires, W1W2-diff wts
ExhName:	Agribrink	OwnerName:	Jake Kraayenbrink	Phone#:
EquipType:	Liquid Manure Spreader	Make:	Nuhn	Model: Magnum 5000

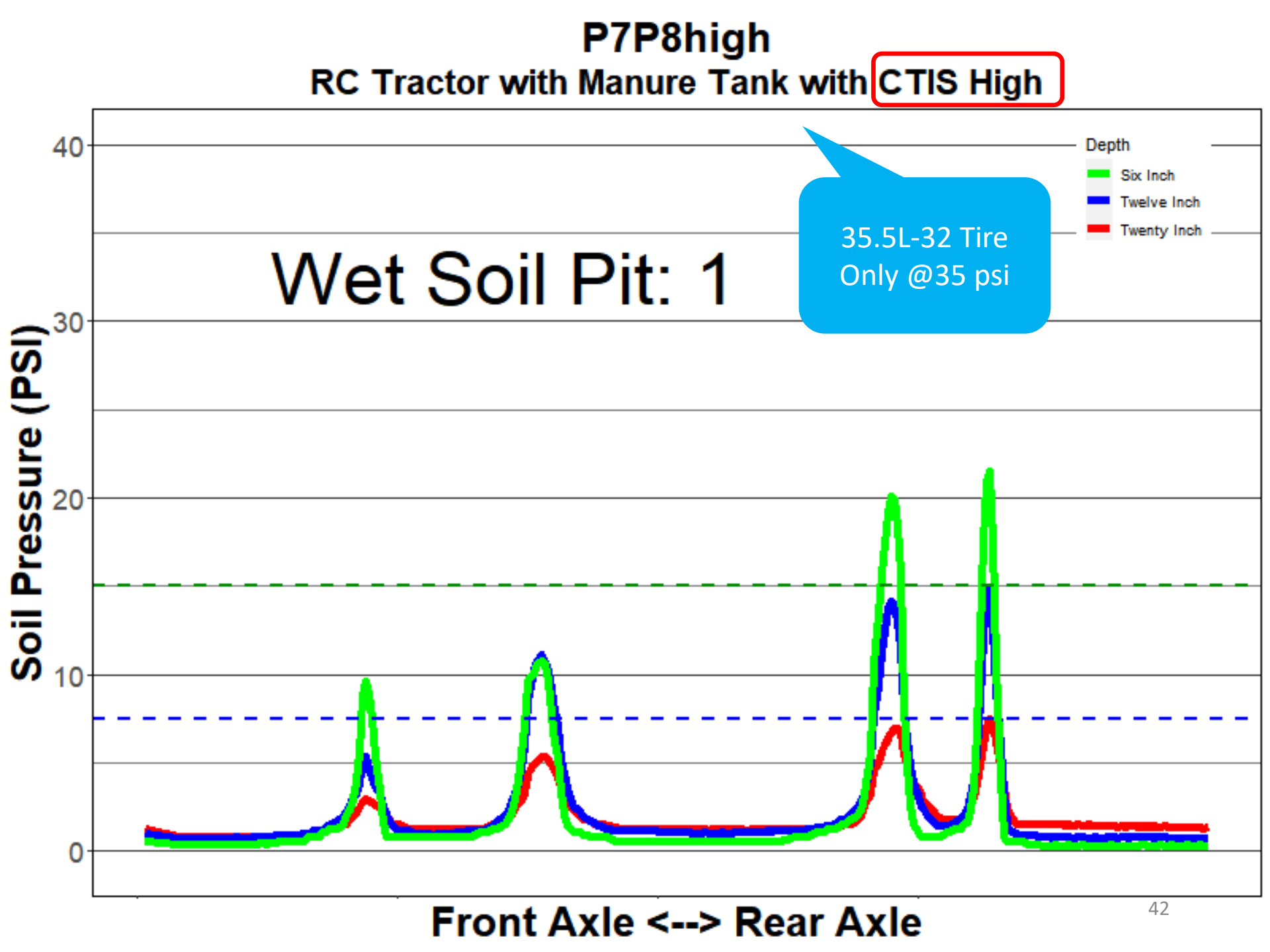
INFO	Axle 1	Axle 2	Axle 3	Axle 4	Axle 5	Axle 6
Tire/Trk Make:	Goodyear					
Tire Model:	All Weather Radial II					
Tire Type:	R	R				
Tire Size:	480/80R38 (18.4R38)					
TireWt (lbs):	12,200	11,120				
Road PSI:	55					
Field PSI:	26					
OnArrival PSI	NA	NA				

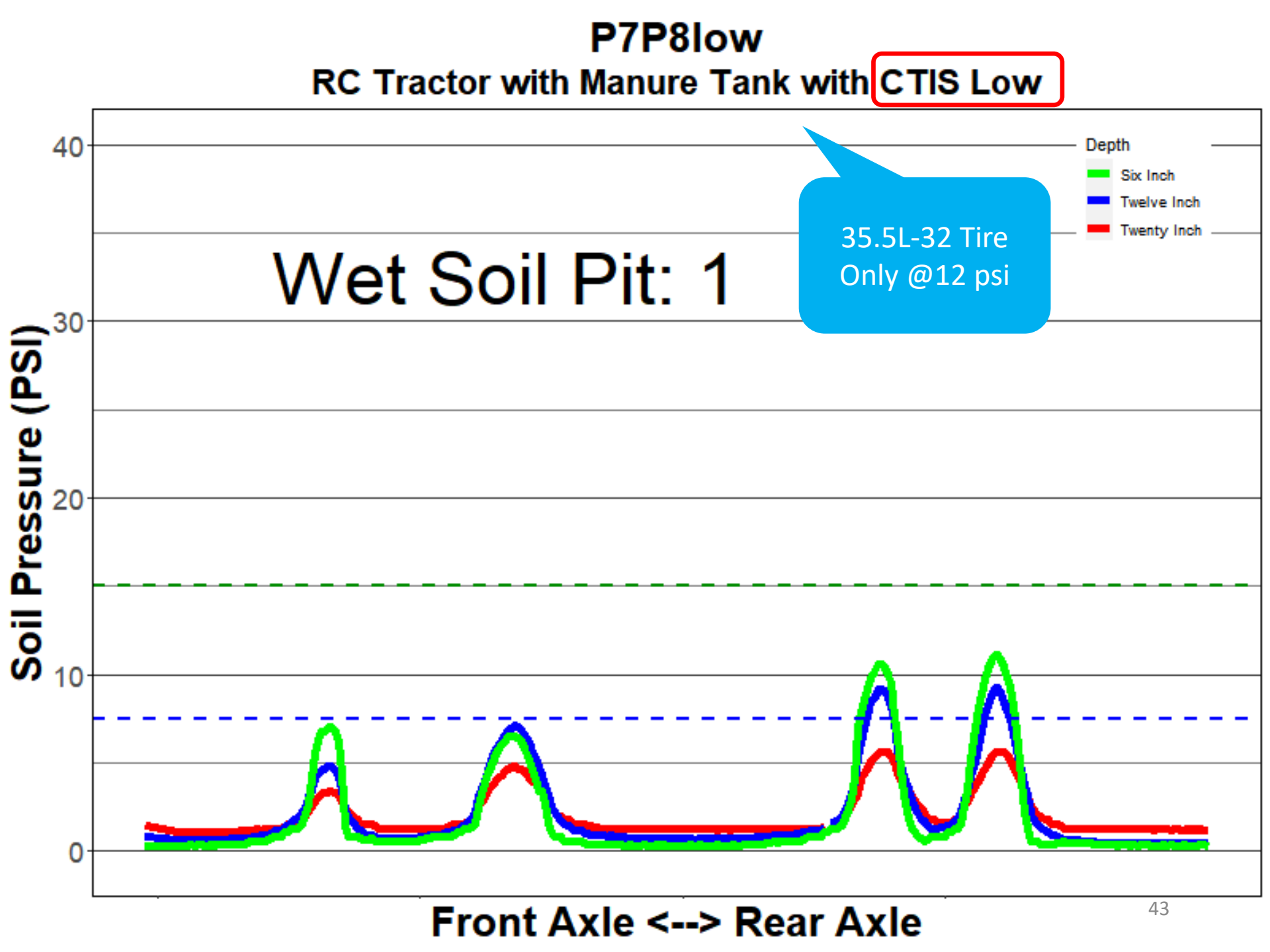
Large Wagon/ Trailer/ Tanks / Etc



INFO	Axle 1	Axle 2	Axle 3	Axle 4	Axle 5	Axle 6
Tire/Trk Make:	Alliance					
Tire Model:	Agri Transport					
Tire Type:	R					
Tire Size:	800/65R32 (30.5LR32)					
TireWt (lbs):	12,700	12,100				
Road PSI:	35					
Field PSI:	12					
OnArrival PSI	NA	NA				

CTIS: Yes / No


P7P8high
RC Tractor with Manure Tank with CTIS High
Wet Soil Pit: 1
35.5L-32 Tire
Only @35 psi
Depth
Six Inch
Twelve Inch
Twenty Inch
Soil Pressure (PSI)
40
30
20
10
0
Front Axle <--> Rear Axle


P7P8low
RC Tractor with Manure Tank with CTIS Low
Wet Soil Pit: 1
35.5L-32 Tire
Only @12 psi
Depth
Six Inch
Twelve Inch
Twenty Inch
Soil Pressure (PSI)
40
30
20
10
0
Front Axle <--> Rear Axle

Data Comments – P07+P08

- Only the larger 30.5L-32 tire was tested at low (12) and high (35) PSI.
- On wet soils and heavy loads that come with manure tankers, big,low pressure tires is the goal and this is achieved with CTIS systems that allow you to change the PSI between road and field travel.
- Other instances on this configuration to view differences in tire size, PSI, etc can be found at Hamilton-Brant and Elgin compaction among others.

2022 Perth SCIA Compaction Event

Exhibit: P09+P10

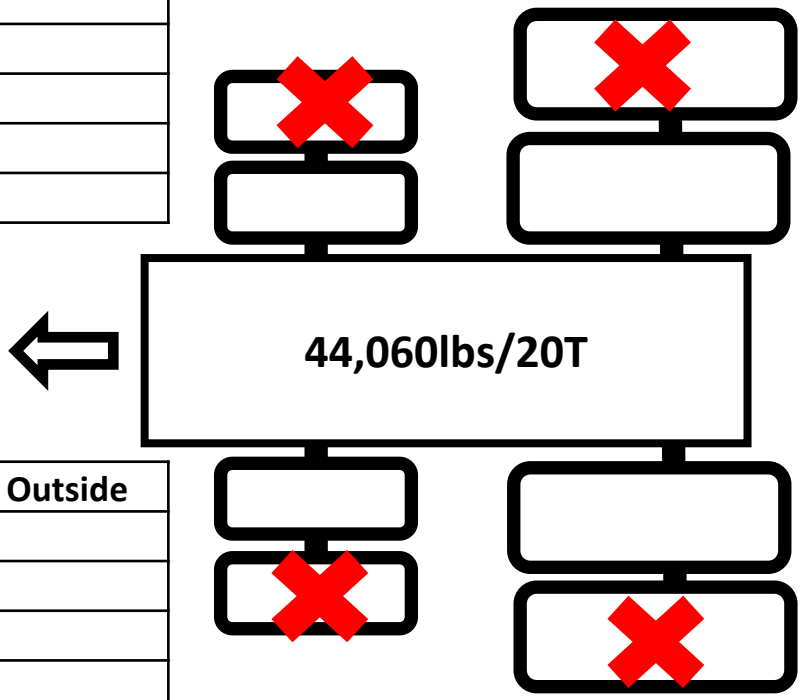
Case Magnum 380 RC + Veenhuis JVZK23000 Dump Cart w Tandem 750s (Box Manure Spreader Mimic)


380
AFS
CASE IH
MAGNUM
Bradl Farms
Veenhuis
Veenhuis
JVZK 23000

Exh#:	P9	ExhNote:	+P10		AB-diff psi, LR-diff tires, W1W2-diff wts
ExhName:		OwnerName:	Josh Boersen	Phone#:	
EquipType:	RC Tractor	Make:	CaseIH	Model:	Magnum 380

INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Axiobib	
Tire Type:	VF	
Tire Size:	VF650/60R34	
TireWt (lbs):	5300	
Road PSI:	9	
Field PSI:	9	
OnArrival PSI	ctis	

INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Axiobib	
Tire Type:	IF	
Tire Size:	IF710/75R42	
TireWt (lbs):	17200	
Road PSI:	25	
Field PSI:	20	
OnArrival PSI	ctis	



INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Axiobib	
Tire Type:	VF	
Tire Size:	VF650/60R34	
TireWt (lbs):	5160	
Road PSI:	9	
Field PSI:	9	
OnArrival PSI	ctis	

INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Axiobib	
Tire Type:	IF	
Tire Size:	IF710/75R42	
TireWt (lbs):	16400	
Road PSI:	25	
Field PSI:	20	
OnArrival PSI	ctis	

Row Crop Tractor - Wheeled

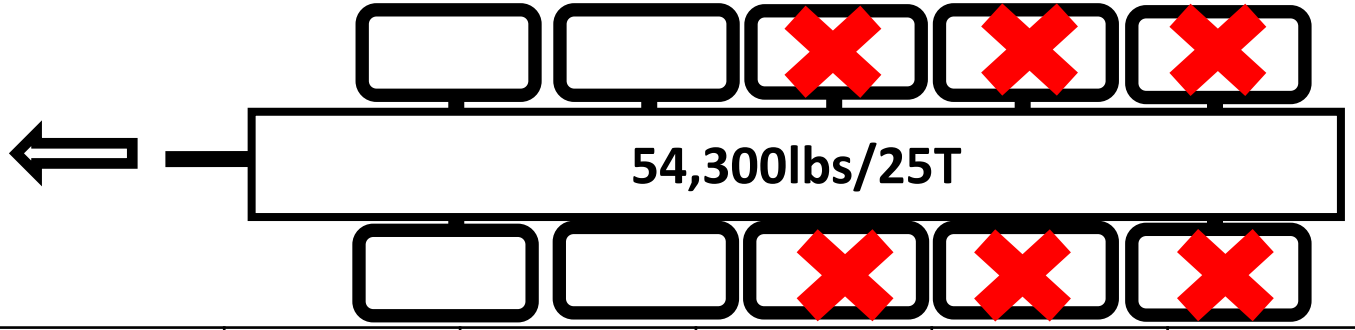
CTIS: Yes / No?


Veenhuis
JVZK 23000
Jan Veenhuis

Exh#:	P10	ExhNote:	+P9	AB-diff psi, LR-diff tires, W1W2-diff wts
ExhName:		OwnerName:	Josh Boersen	Phone#:
EquipType:	Dump Trailer	Make:		Model:

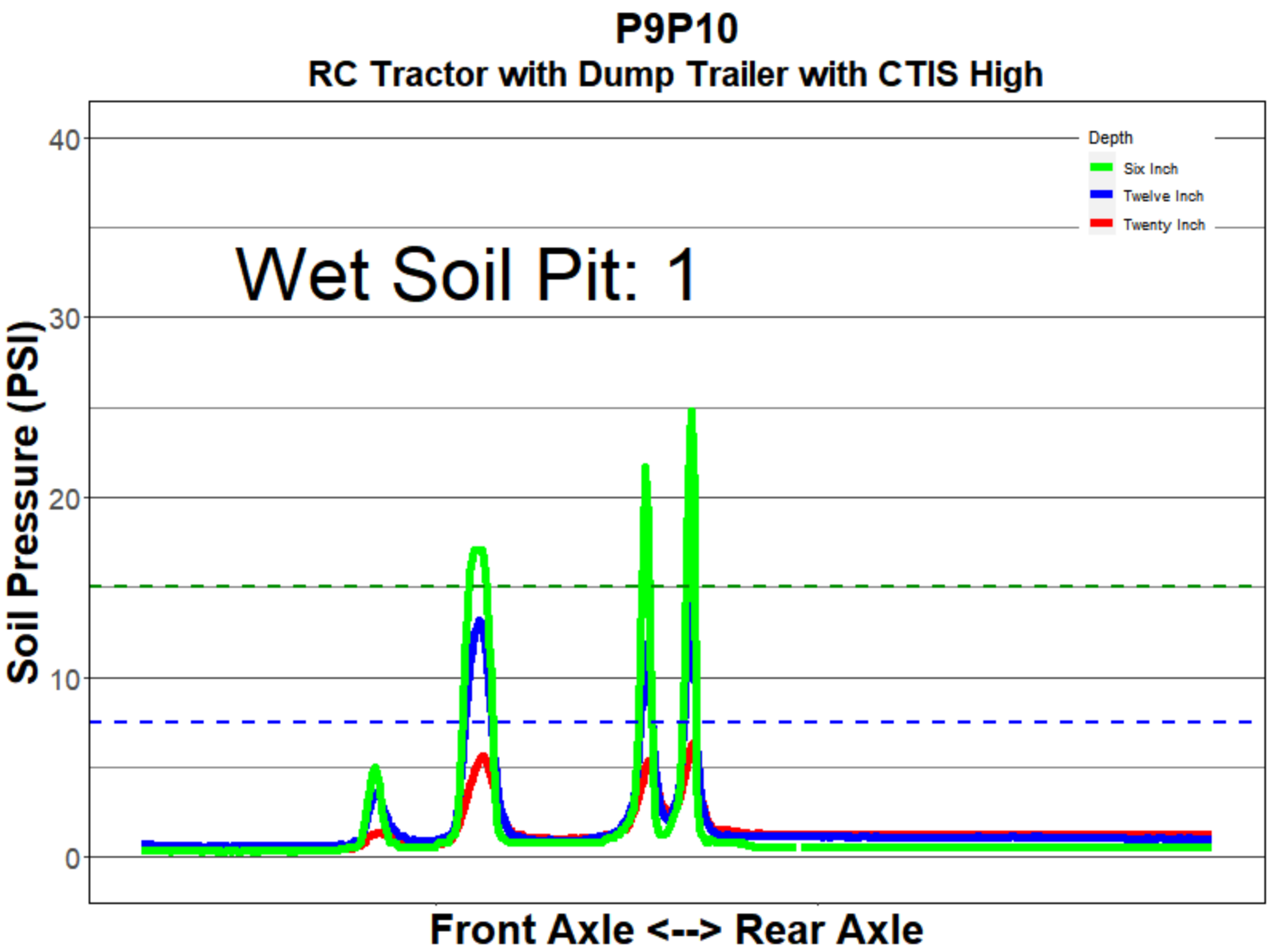
INFO	Axle 1	Axle 2	Axle 3	Axle 4	Axle 5	Axle 6
Tire/Trk Make:	BKT	BKT				
Tire Model:	FL 630 Super	FL 630 Super				
Tire Type:	Radial	Radial				
Tire Size:	750/45R26.5	750/45R26.5				
TireWt (lbs):	14100	15300				
Road PSI:	58	58				
Field PSI:	35	35				
OnArrival PSI	NA	NA				

Large Wagon/ Trailer/ Tanks / Etc



INFO	Axle 1	Axle 2	Axle 3	Axle 4	Axle 5	Axle 6
Tire/Trk Make:	BKT	BKT				
Tire Model:	FL 630 Super	FL 630 Super				
Tire Type:	Radial	Radial				
Tire Size:	750/45R26.5	750/45R26.5				
TireWt (lbs):	12480	12420				
Road PSI:	58	58				
Field PSI:	35	35				
OnArrival PSI	NA	NA				

CTIS: Yes / No


P9P10
RC Tractor with Dump Trailer with CTIS High
Wet Soil Pit: 1
Depth
Six Inch
Twelve Inch
Twenty Inch
Soil Pressure (PSI)
40
30
20
10
0
Front Axle <--> Rear Axle

Data Comments – P09+P10

- Under these soil moisture conditions the loaded dump wagon was exerting significant stress into the soil at 6 and 12”.
- However, the overall weight of this trailer was not enough to exert an unreasonable amount of stress at the 20” depth.
- Bigger tires, and/or lower field PSI would reduce the shallower threat of compaction under these wet soil conditions.

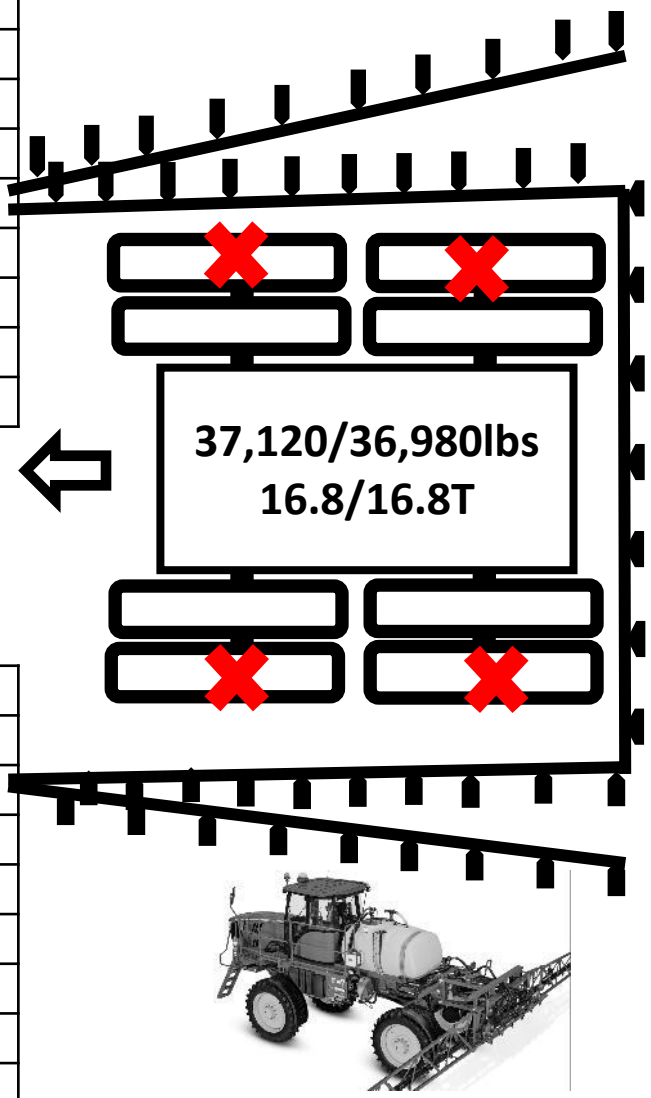
2022 Perth SCIA Compaction Event

Exhibit: P11
Case Patriot 3340 SP Sprayer w VF 380/90R46


CASE IH

Exh#:	P11	ExhNote:		AB-diff psi, LR-diff tires, W1W2-diff wts
ExhName:		OwnerName:	Josh Boersen	Phone#:
EquipType:	SP Sprayer	Make:	CaseIH	Model: Patriot 3340

INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Spraybib	
Tire Type:	VF	
Tire Size:	VF380/90R46	
TireWt (lbs):	9500/7960	Boom In/Out
Road PSI:	41	
Field PSI:		
OnArrival PSI	45	



INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Spraybib	
Tire Type:	VF	
Tire Size:	VF380/90R46	
TireWt (lbs):	9100/10600	Boom In/Out
Road PSI:	41	
Field PSI:		
OnArrival PSI	43	

1020 Usgal spray tank+100USgal Rinse Tank

INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Spraybib	
Tire Type:	VF	
Tire Size:	VF380/90R46	
TireWt (lbs):	9040/7780	Boom In/Out
Road PSI:	41	
Field PSI:		
OnArrival PSI	37	

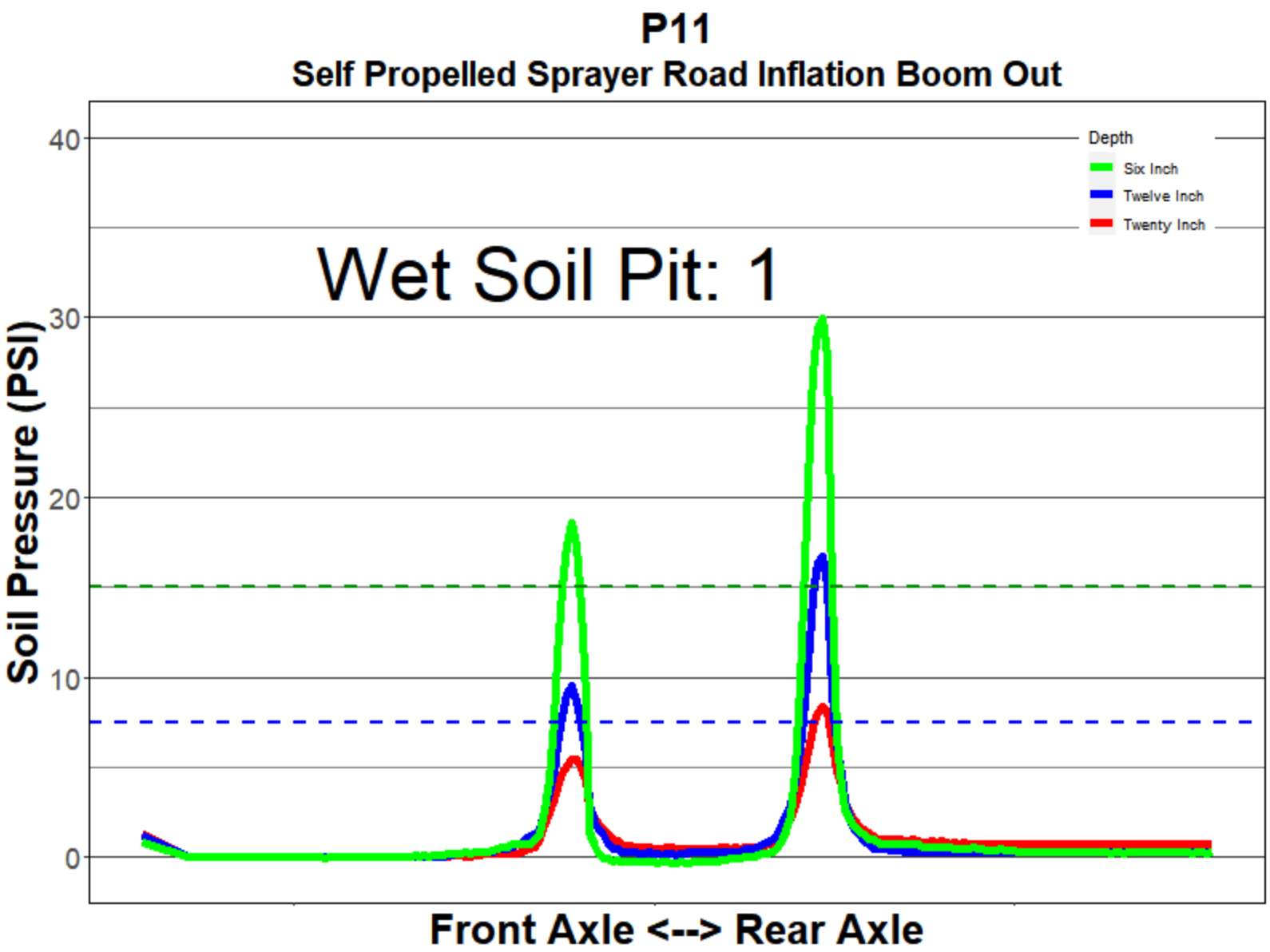
INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Spraybib	
Tire Type:	VF	
Tire Size:	VF380/90R46	Boom In/Out
TireWt (lbs):		
Road PSI:	41	
Field PSI:		
OnArrival PSI	44	

SP Sprayer – Rear Boom

Empty or Loaded?

Boom Road or Field?

CTIS: Yes / No?


P11
Self Propelled Sprayer Road Inflation Boom Out
Wet Soil Pit: 1
Depth
Six Inch
Twelve Inch
Twenty Inch
Soil Pressure (PSI)
40
30
20
10
0
Front Axle <--> Rear Axle

Data Comments – P11

- Tires were standard 380 radials but were tested under wet pit conditions, more like spring or fall, with boom in field position.
- 380s are not appropriate for spring and fall, too much compaction threat exists with narrow high PSI tires.
- SP sprayers are recommended to have two sets of tires for Spr/Fall and Summer in crop, narrows and wides.
- Note the theoretical threshold of pressure being exceeded at all depths with the rear tires especially.

2022 Perth SCIA Compaction Event

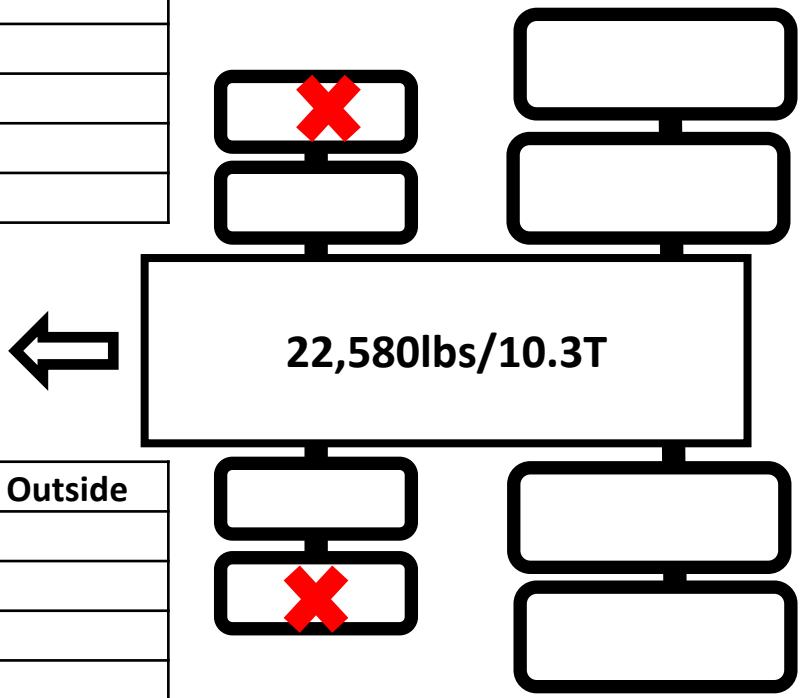
Exhibit: P12+P13
New HollandT7-235 RC + JD
1990 Centre Fill Air Seeder


NEW HOLLAND

Exh#:	P12	ExhNote:	+P13		AB-diff psi, LR-diff tires, W1W2-diff wts
ExhName:		OwnerName:	Kay McLagan	Phone#:	
EquipType:	RC Tractor		Make: NH	Model:	T7-235

INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Agribib	
Tire Type:	R	
Tire Size:	380/85R34	
TireWt (lbs):	4780	
Road PSI:		
Field PSI:		
OnArrival PSI	23	

INFO	Inside	Outside
Tire/Trk Make:	Michelin	Michelin
Tire Model:	Agribib	Agribib
Tire Type:	R	R
Tire Size:	480/80R46	480/80R46
TireWt (lbs):	3500	330 0
Road PSI:		
Field PSI:		
OnArrival PSI	18	16



INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Agribib	
Tire Type:	R	
Tire Size:	380/85R34	
TireWt (lbs):	4660	
Road PSI:		
Field PSI:		
OnArrival PSI	21	

INFO	Inside	Outside
Tire/Trk Make:	Michelin	Michelin
Tire Model:	Agribib	Agribib
Tire Type:	R	R
Tire Size:	480/80R46	480/80R46
TireWt (lbs):	3400	2940
Road PSI:		
Field PSI:		
OnArrival PSI	18	16

Row Crop Tractor - Wheeled

CTIS: Yes / No?

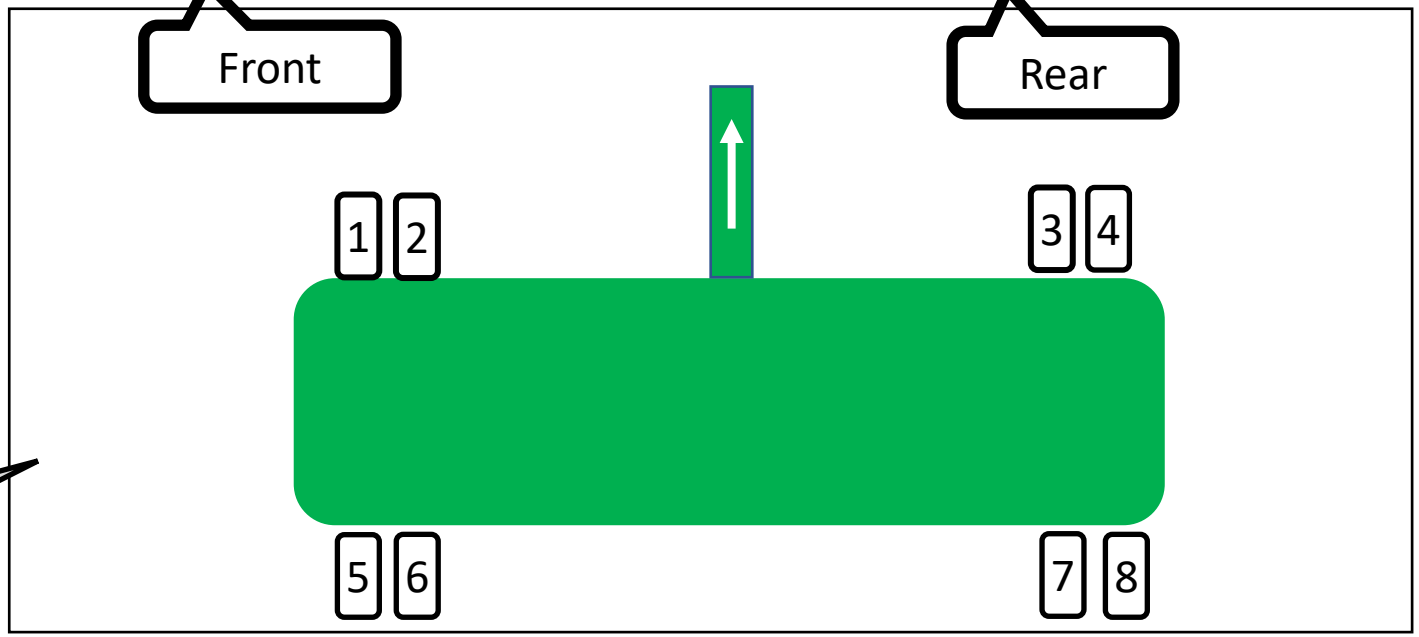

JOHN DEERE
CCS SeedMetering

Exh#:	P13	ExhNote:	+P12		AB-diff psi, LR-diff tires, W1W2-diff wts
ExhName:		OwnerName:	Kay McLagan	Phone#:	
EquipType:		Make:	JD	Model:	1990

INFO	Tire 1	Tire 2	Tire 3	Tire 4	Tire 5	Tire 6	Tire 7	Tire 8
Tire/Trk Make:	Galaxy →							
Tire Model:	Seeder →							
Tire Type:	Bias →							
Tire Size:	31x13.50-15SL							
TireWt (lbs):	2740	2360	3200	3200	4360	3020	2680	2300
Road PSI:								
Field PSI:								
OnArrival PSI	35	29	39	35	41	34	38	37

E = empty and L = loaded

R = road and F = field



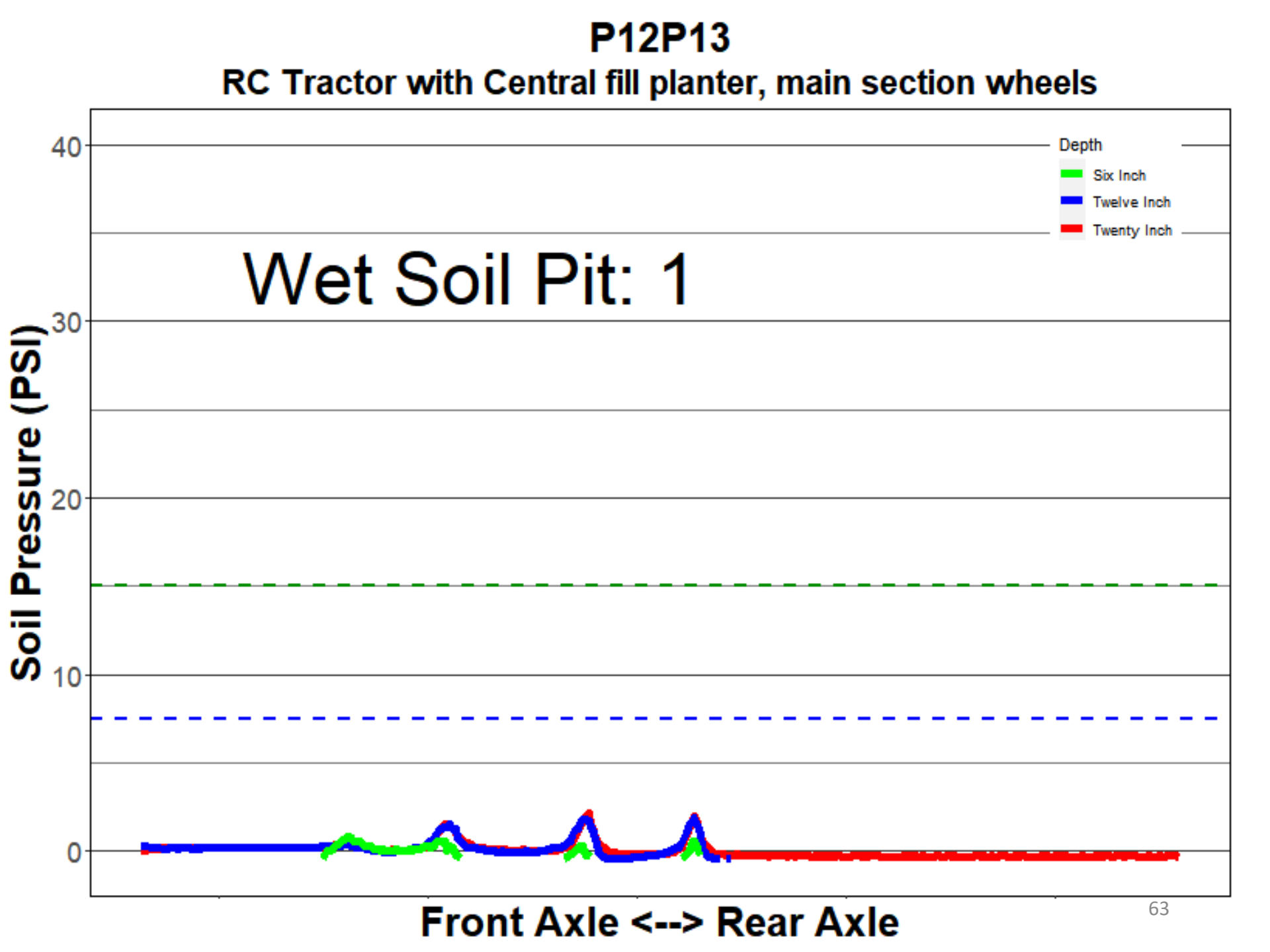
Draw Tire Layout and Label Each Tire

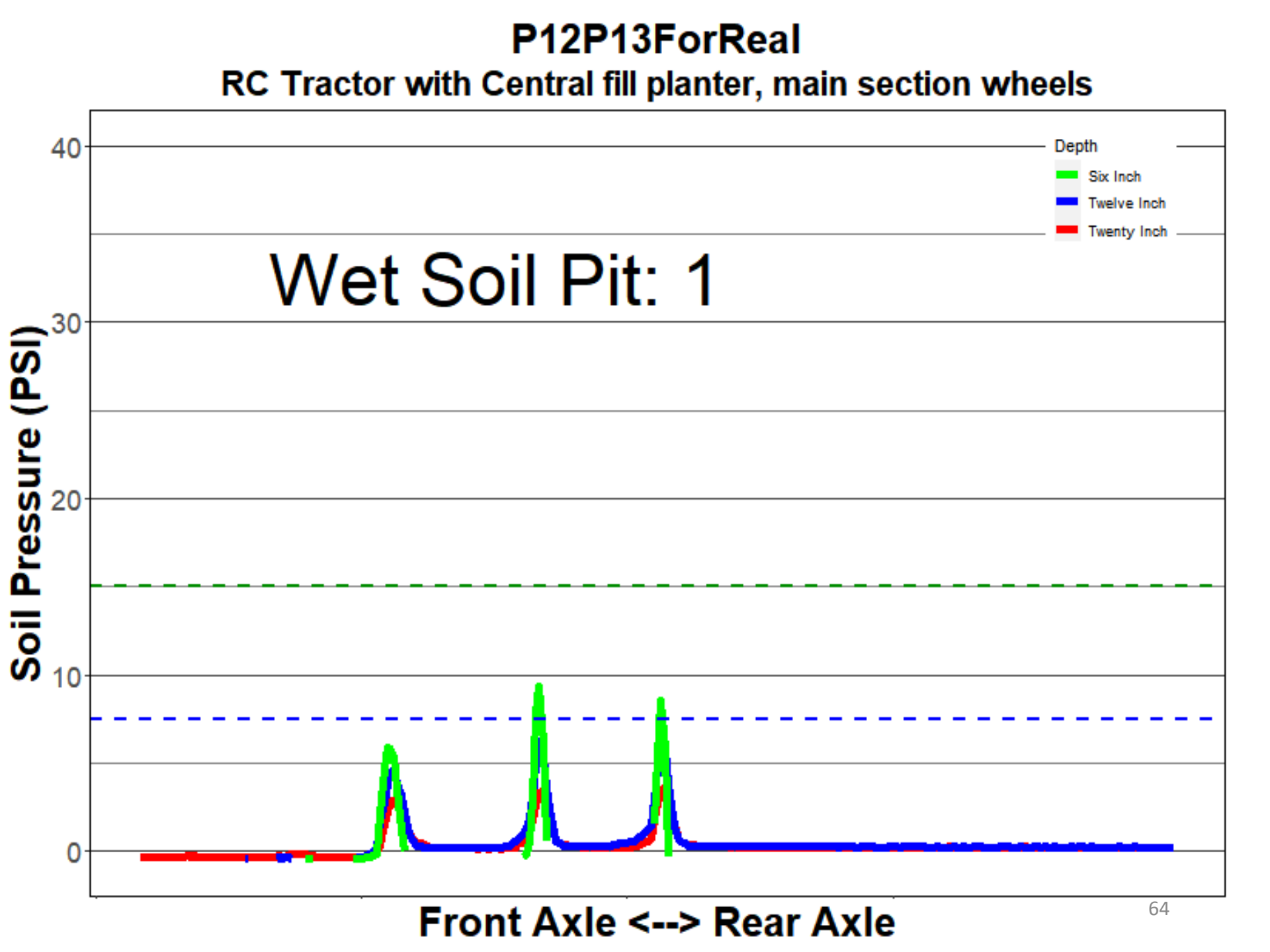
Corn Planter

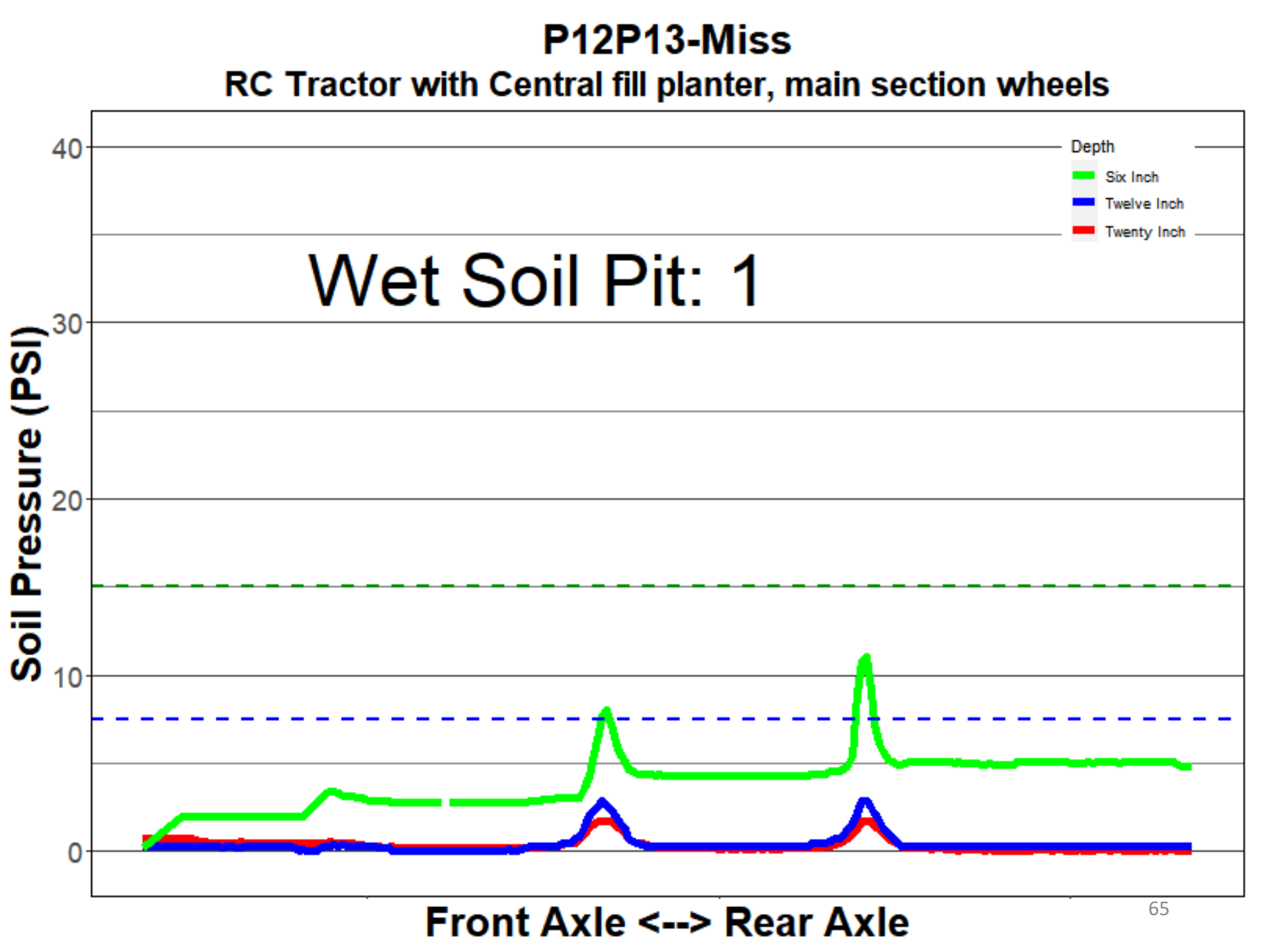
Empty or Loaded?

Road or Field?

CTIS: Yes / No?


P12P13
RC Tractor with Central fill planter, main section wheels
Depth
Six Inch
Twelve Inch
Twenty Inch
Wet Soil Pit: 1
40
30
20
10
0
Soil Pressure (PSI)
Front Axle <--> Rear Axle


P12P13ForReal
RC Tractor with Central fill planter, main section wheels
Depth
Six Inch
Twelve Inch
Twenty Inch
Wet Soil Pit: 1
Soil Pressure (PSI)
40
30
20
10
0
Front Axle <--> Rear Axle


P12P13-Miss
RC Tractor with Central fill planter, main section wheels
Depth
Six Inch
Twelve Inch
Twenty Inch
Wet Soil Pit: 1
Soil Pressure (PSI)
40
30
20
10
0
Front Axle <--> Rear Axle

Data Comments – P12+P13

- The data for this exhibit is not useable since the drill was not loaded.
- The majority of equipment configurations that haul weight are usually not problematic across fields when empty as shown by the graphs.
- Compaction event testing is always done with equipment fully loaded, which was not possible with this unit.
- The empty weights are still valuable in showing the distribution of weight around the various implement tires.
- Planters and drills should be weighed when filled and ready for planting so that decisions about when soils are fit can be made. See general comments in accompanying articles.

2022 Perth SCIA Compaction Event

Exhibit: P14+P15

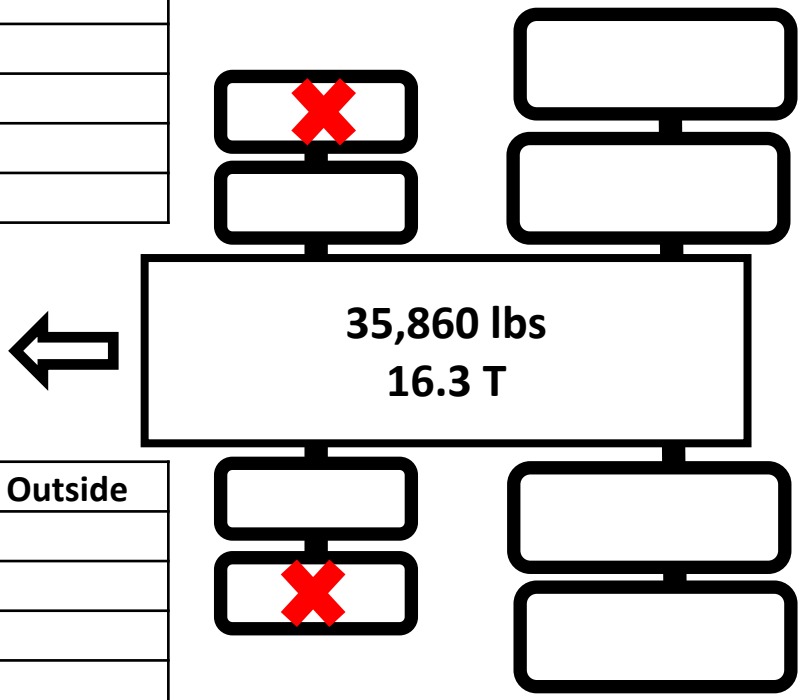
John Deere 7290R + Penta DB50 Silage Wagon w 800/45R26.5 & CTIS


JOHN DEERE
7290 R
PENTA

Exh#:	P14	ExhNote:	+P15		AB-diff psi, LR-diff tires, W1W2-diff wts
ExhName:		OwnerName:	Steenbeek	Phone#:	
EquipType:	RC Tractor		Make: JD	Model:	7290R

INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Axiobib	
Tire Type:	Radial	
Tire Size:	600/70R30	
TireWt (lbs):	7060	
Road PSI:	15/21	
Field PSI:	12	
OnArrival PSI	CTIS	

INFO	Inside	Outside
Tire/Trk Make:	Michelin	Michelin
Tire Model:	Axiobib	MachXbib
Tire Type:	Radial	Radial
Tire Size:	710/70R42	710/70R42
TireWt (lbs):	5800	5500
Road PSI:	9/15	
Field PSI:	6	
OnArrival PSI	CTIS	CTIS



INFO	Inside	Outside
Tire/Trk Make:	Michelin	
Tire Model:	Axiobib	
Tire Type:	Radial	
Tire Size:	600/70R30	
TireWt (lbs):	6940	
Road PSI:		
Field PSI:		
OnArrival PSI	CTIS	

INFO	Inside	Outside
Tire/Trk Make:	Michelin	Michelin
Tire Model:	Axiobib	MachXbib
Tire Type:	Radial	Radial
Tire Size:	710/70R42	710/70R42
TireWt (lbs):	5260	5300
Road PSI:		
Field PSI:		
OnArrival PSI	CTIS	CTIS

Row Crop Tractor - Wheeled

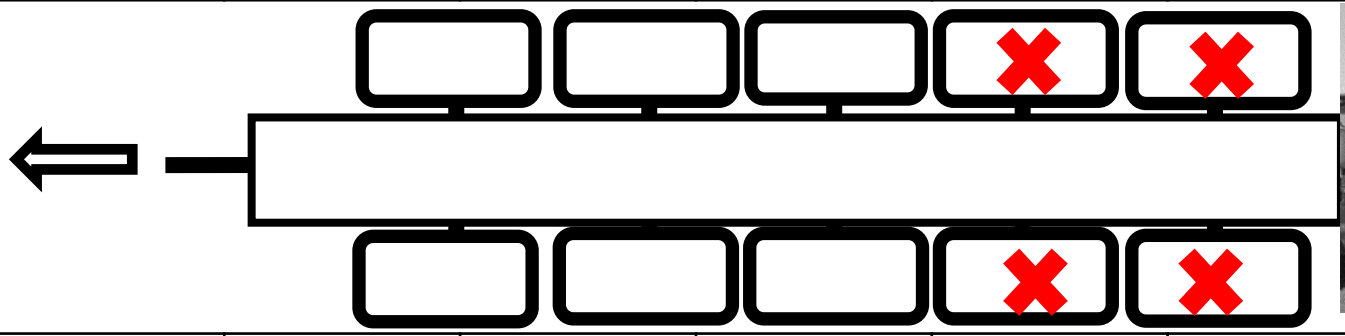
CTIS: Yes / No?


PENTA
DB50
AgriBrink

Exh#:	P15	ExhNote:	+P14		AB-diff psi, LR-diff tires, W1W2-diff wts
ExhName:		OwnerName:	Gerard Steenbeek	Phone#:	
EquipType:	Wagon – Silage Dump		Make: Penta	Model:	DB50

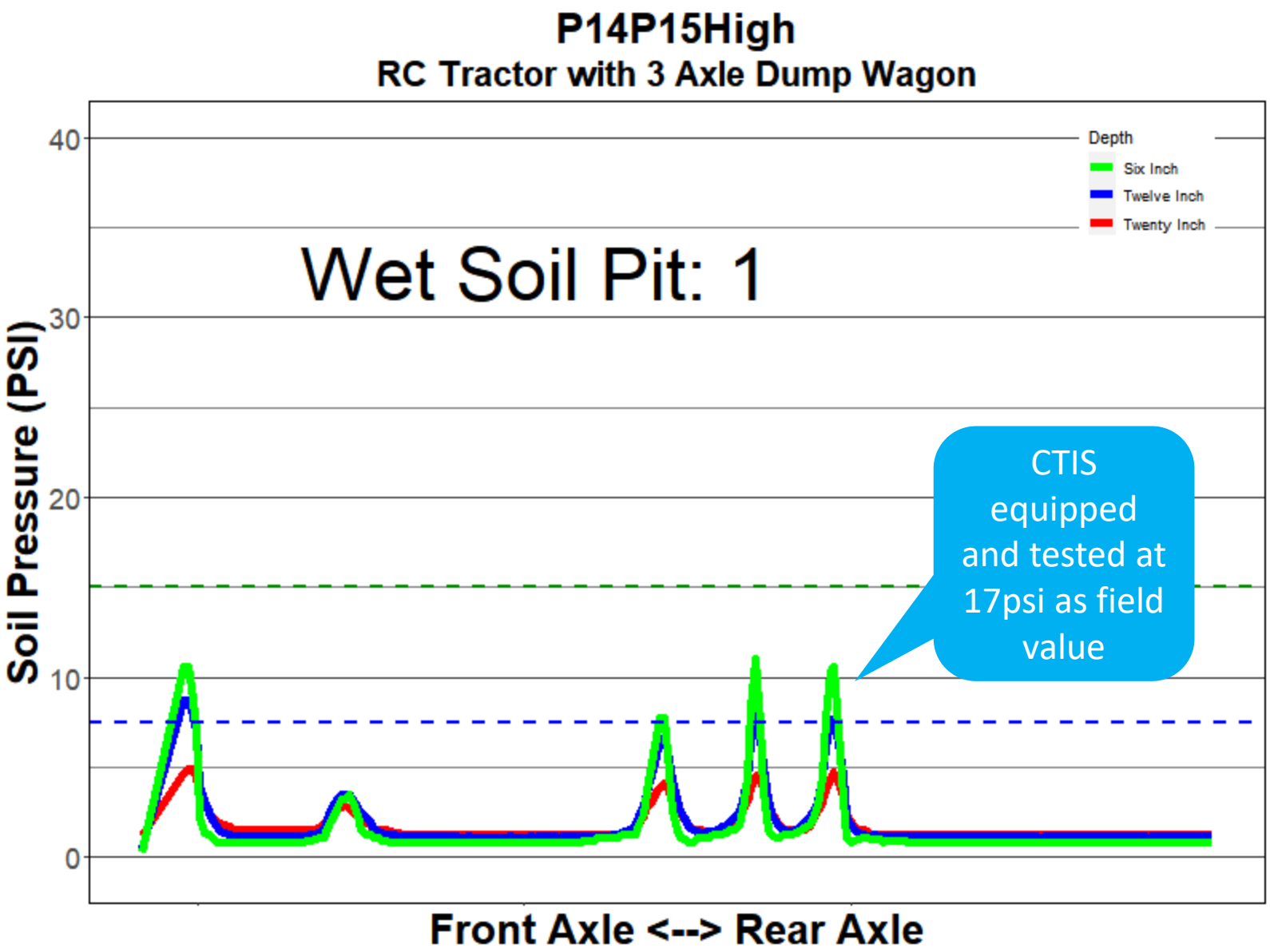
INFO	Axle 1	Axle 2	Axle 3	Axle 4	Axle 5	Axle 6
Tire/Trk Make:	BKT	BKT	BKT			
Tire Model:	FC 630	FC 630	FC 630			
Tire Type:	Radial	Radial	Radial			
Tire Size:	800/45R26.5	800/45R26.5	800/45R26.5			
TireWt (lbs):	7960	7700	7700			
Road PSI:	42	42	42			
Field PSI:	12/17	12/17	12/17			
OnArrival PSI	CTIS	CTIS	CTIS			

Large Wagon/ Trailer/ Tanks / Etc



INFO	Axle 1	Axle 2	Axle 3	Axle 4	Axle 5	Axle 6
Tire/Trk Make:	BKT	BKT	BKT			
Tire Model:	FC 630	FC 630	FC 630			
Tire Type:	Radial	Radial	Radial			
Tire Size:	800/45R26.5	800/45R26.5	800/45R26.5			
TireWt (lbs):	8430	7520	7240			
Road PSI:	42	42	42			
Field PSI:	12/17	12/17	12/17			
OnArrival PSI	CTIS	CTIS	CTIS			

CTIS: Yes / No


P14P15High
RC Tractor with 3 Axle Dump Wagon
Wet Soil Pit: 1
Depth
Six Inch
Twelve Inch
Twenty Inch
Soil Pressure (PSI)
40
30
20
10
0
CTIS equipped and tested at 17psi as field value
Front Axle <--> Rear Axle

Data Comments – P14+P15

- Heavy wagons equipped with CTIS because of significant field and road time, allow changing pressure in the field to significantly reduce operating PSI vs what would be needed if only had to use road pressure
- The high pressure was not conducted but from other examples across the various events, the higher PSI for road would have shown significantly more pressure on each sensor.
- These wagons with multiple axles are well configured for harvesting forages.
- Equipment that carries loads in field and on road should highly consider CTIS systems.