SOYBEAN STORAGE: CRITICAL FACTORS AND TECHNOLOGY ADVANCES FOR STORING SOYBEANS PROFITABLY

Roger Price NA Directer of Grain Sales

AGCO Your Agriculture Company | GSI

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ILLINOIS SOYBEAN ASSOCIATION CHECKOFF PROGRAM

#2020SoybeanSummit

GSI

WHY STORE?

Profit!

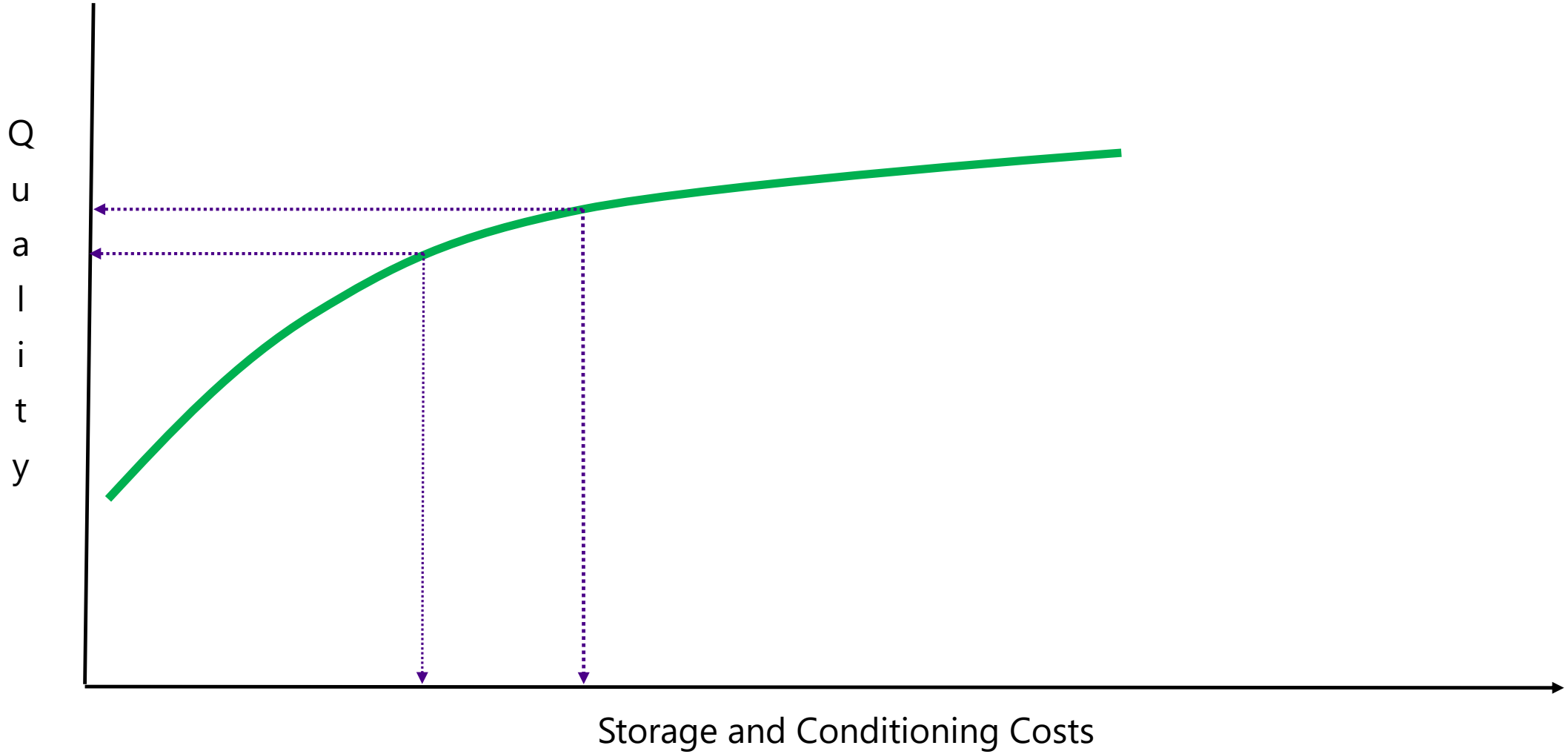
- Better Price
- Conditioning
- Logistics

GRAIN STORAGE RISK VS REWARDS

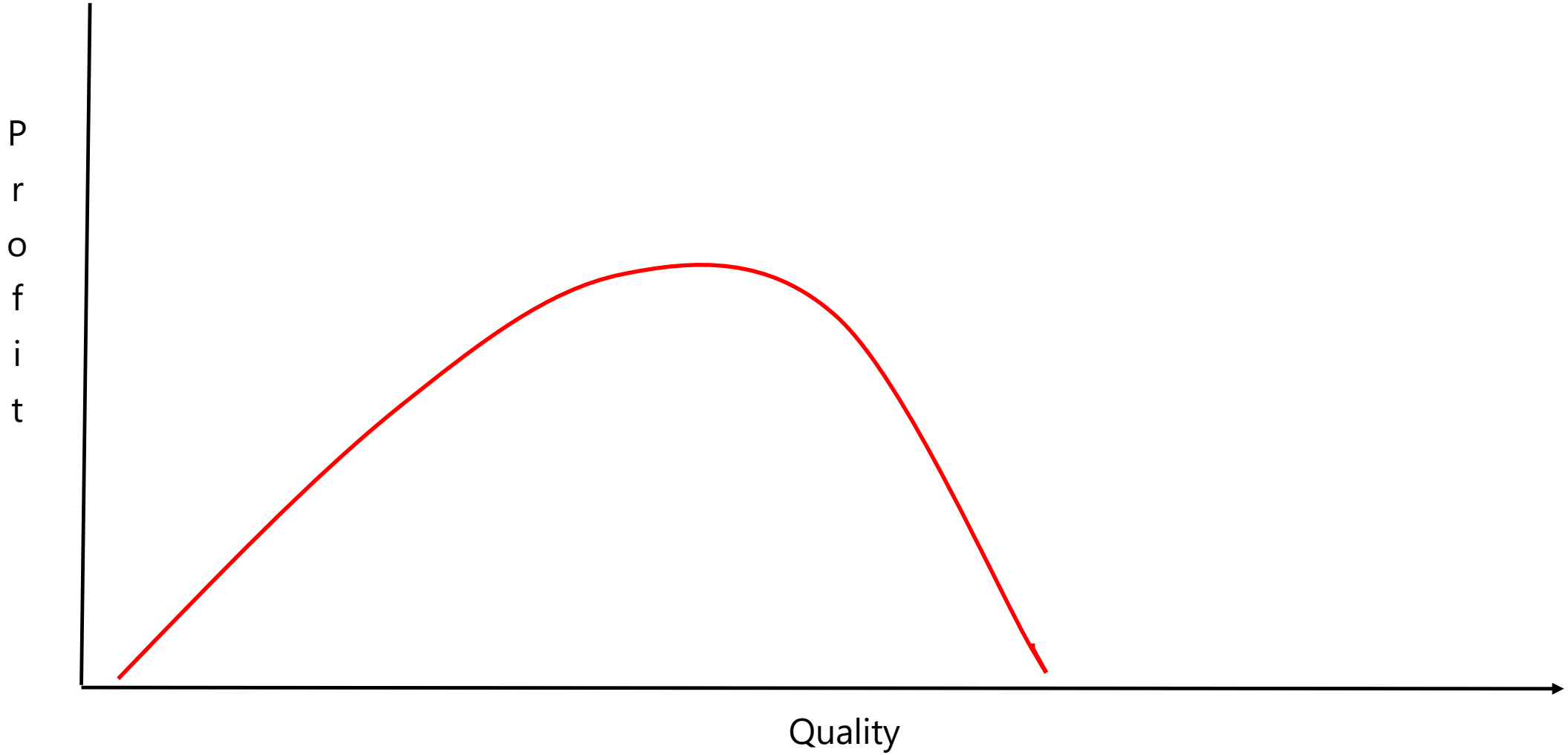
March 2020 Soybean Futures

Last	883-2s
Change	-5-6 (-0.65%)
Open	890-6
Prev. Close	889-0
Today's Range	882-0 – 892-0
52wk Range	841-4 – 970-0
Volume	148
Avg Volume	86,428

STORAGE & CONDITIONING COSTS VS QUALITY



PROFIT VS QUALITY



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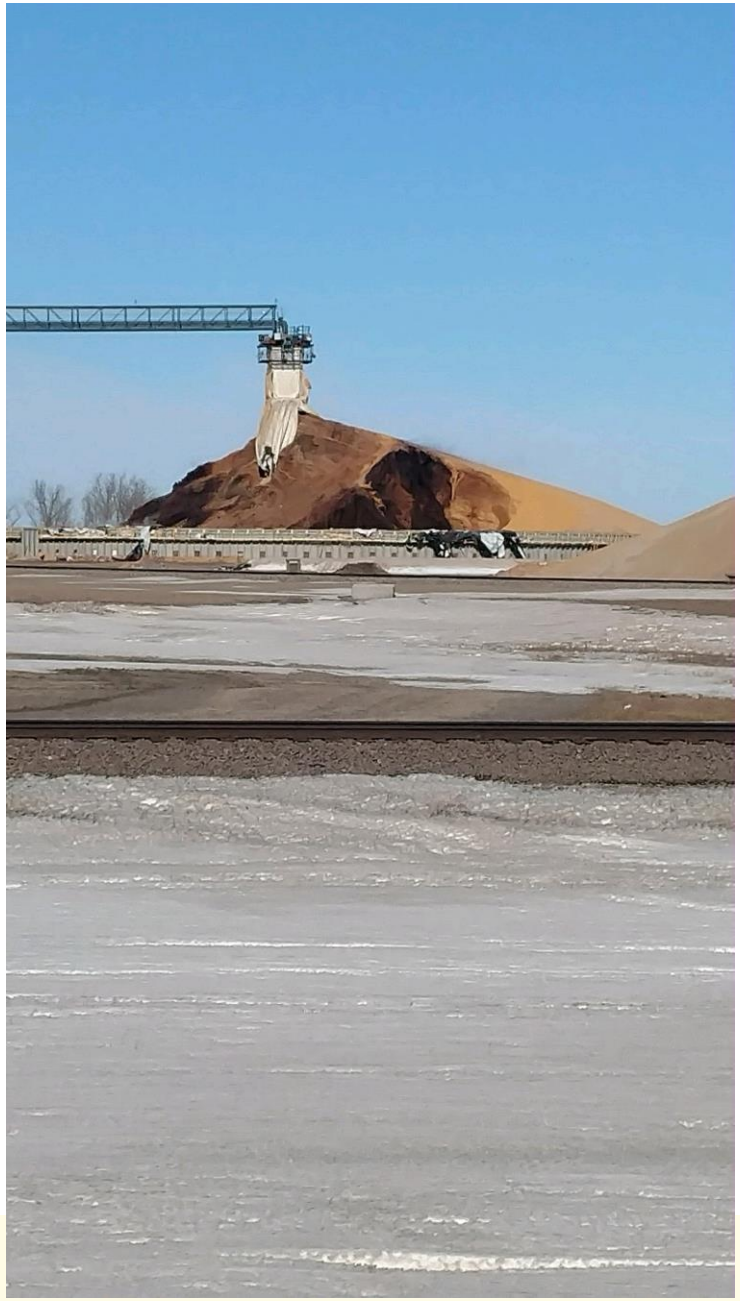

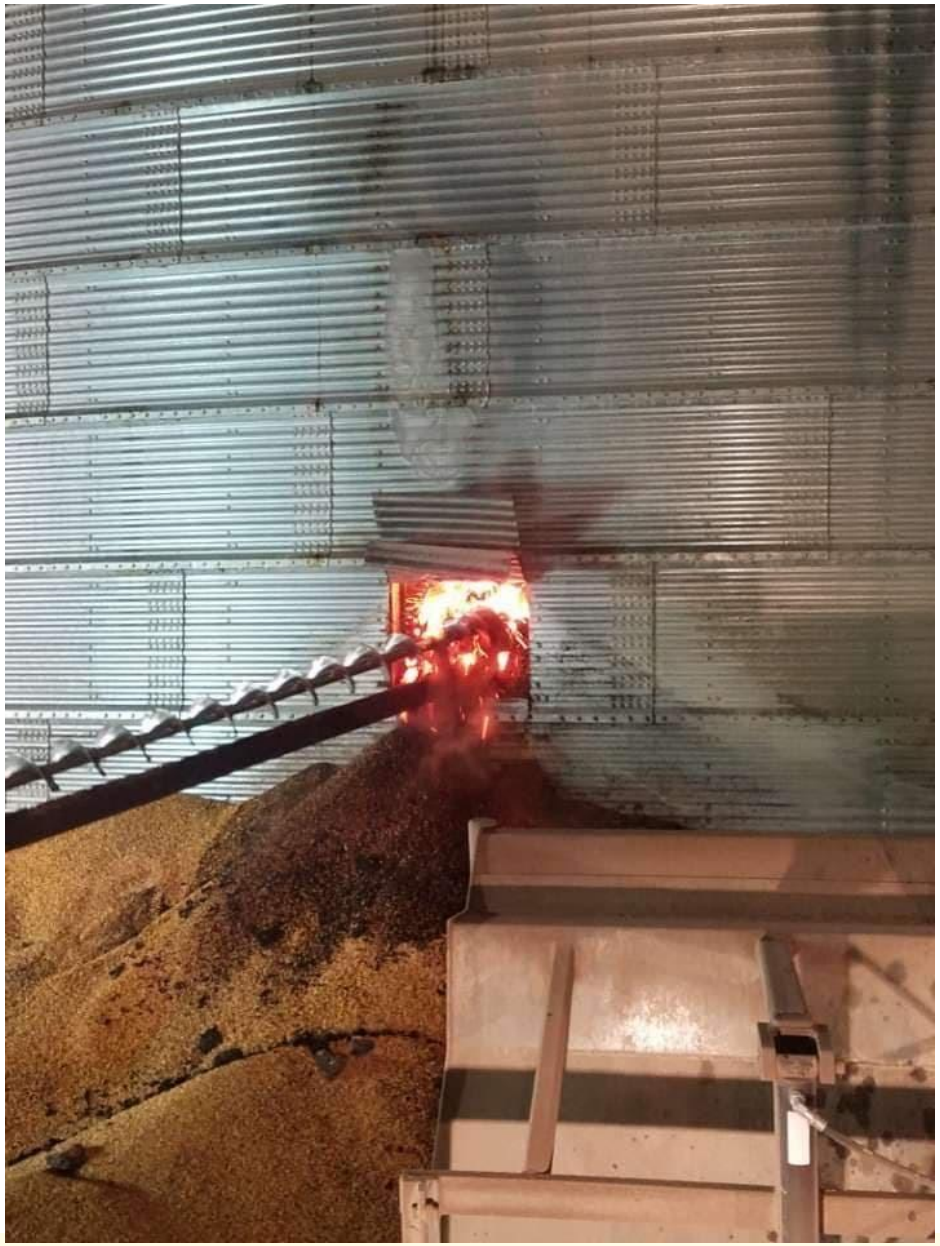

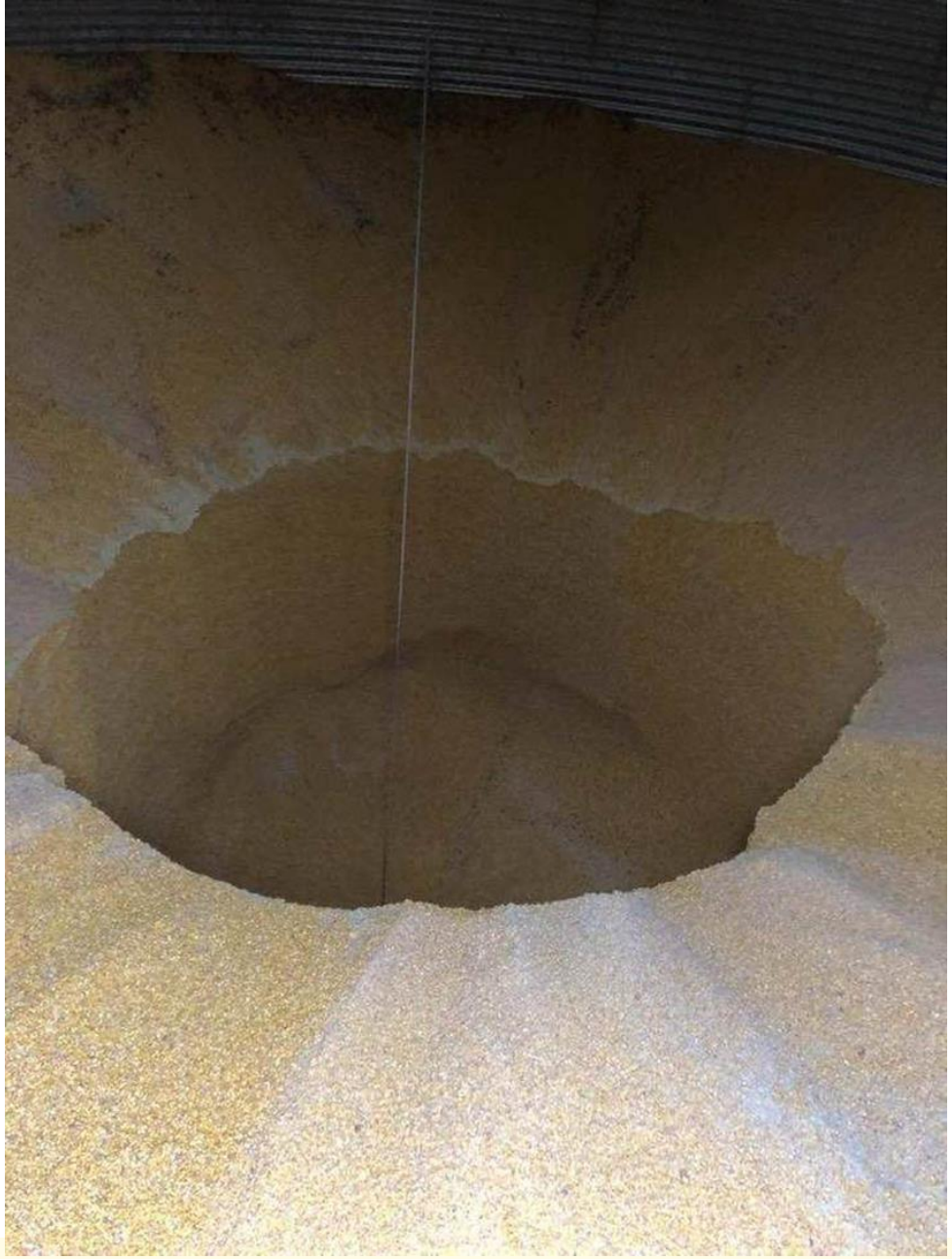

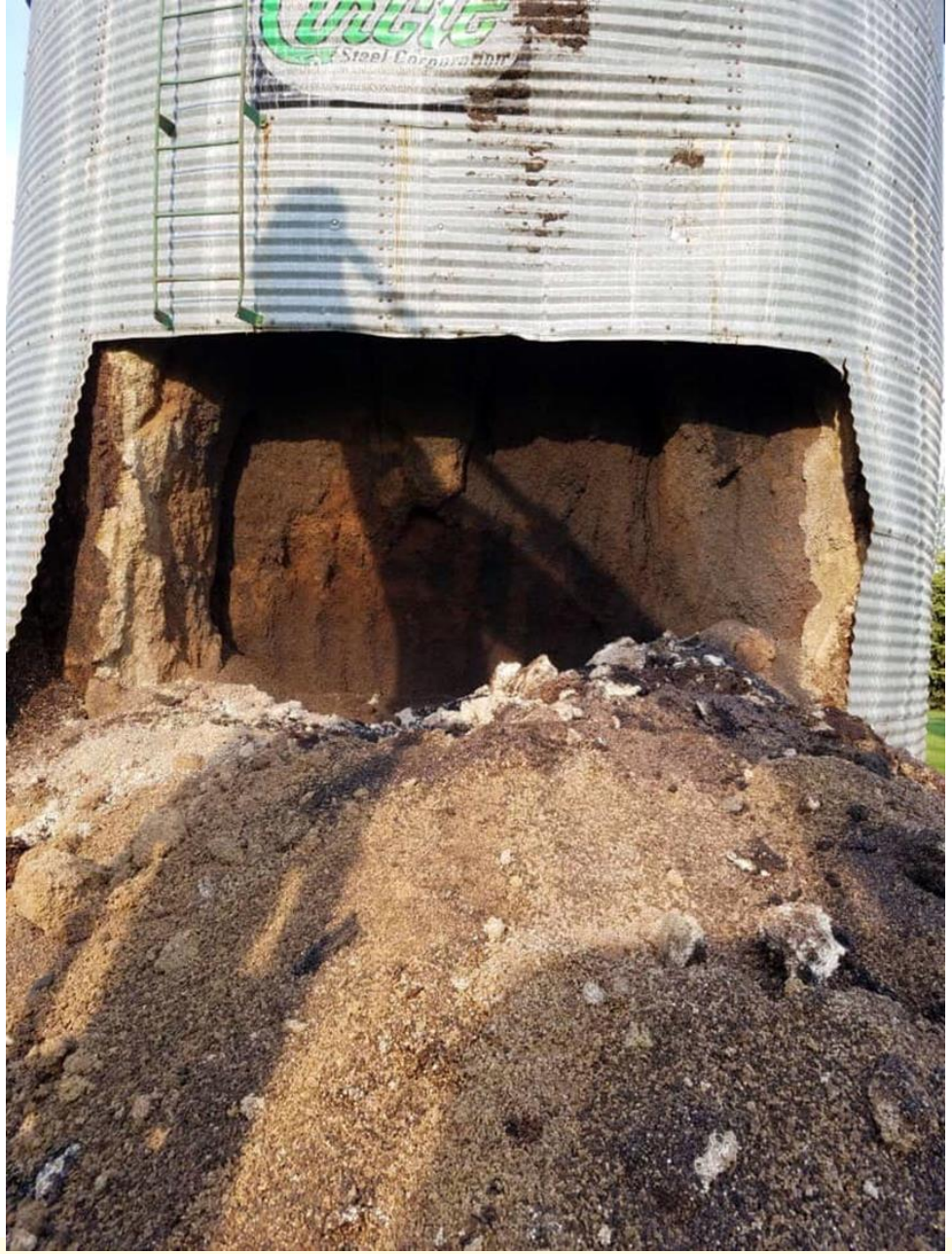

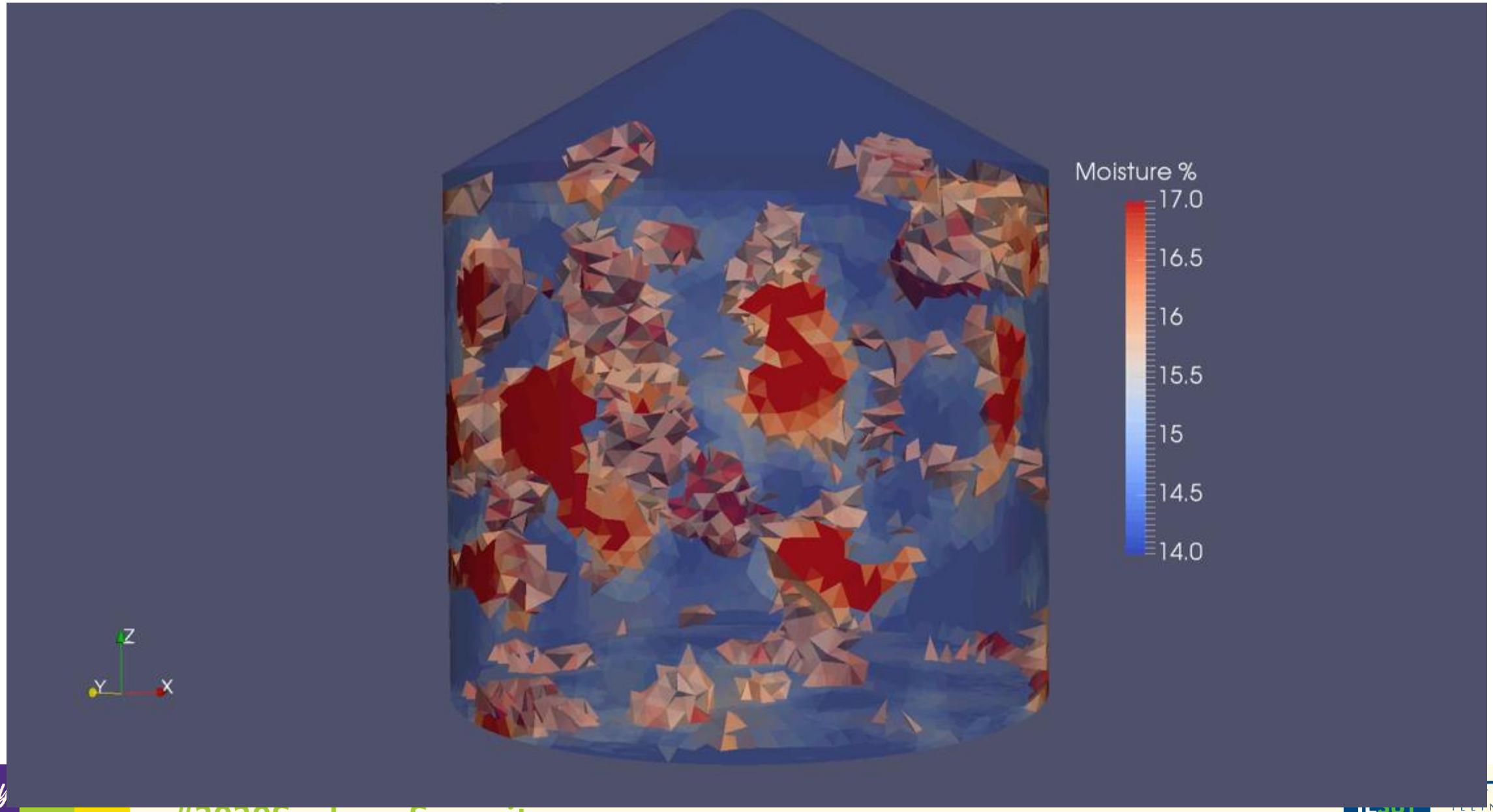
Moisture %
17.0
16.5
16
15.5
15
14.5
14.0
Z
Y
X

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SPREADERS FOR EVEN DISTRIBUTION

WHAT IS QUALITY?

Traditional/Conventional

- Test Weight
- Damage (heat, sprout, mold, insect)
- Foreign Material
- Splits
- Odor
- Infested
- Moisture Content??

Intrinsic

- Oil Content
- Protein
- Starch
- Mycotoxin content
- Starch Content
- Falling Number (dough strength)
- Color
- Moisture!

SUMMARY

The key to profitable storage is managing moisture!

GRAINVIZ IMAGING SYSTEMS

Paul Card, President & CEO

GrainViz

pcard@grainviz.com

ILLINOIS SOYBEAN ASSOCIATION CHECKOFF PROGRAM

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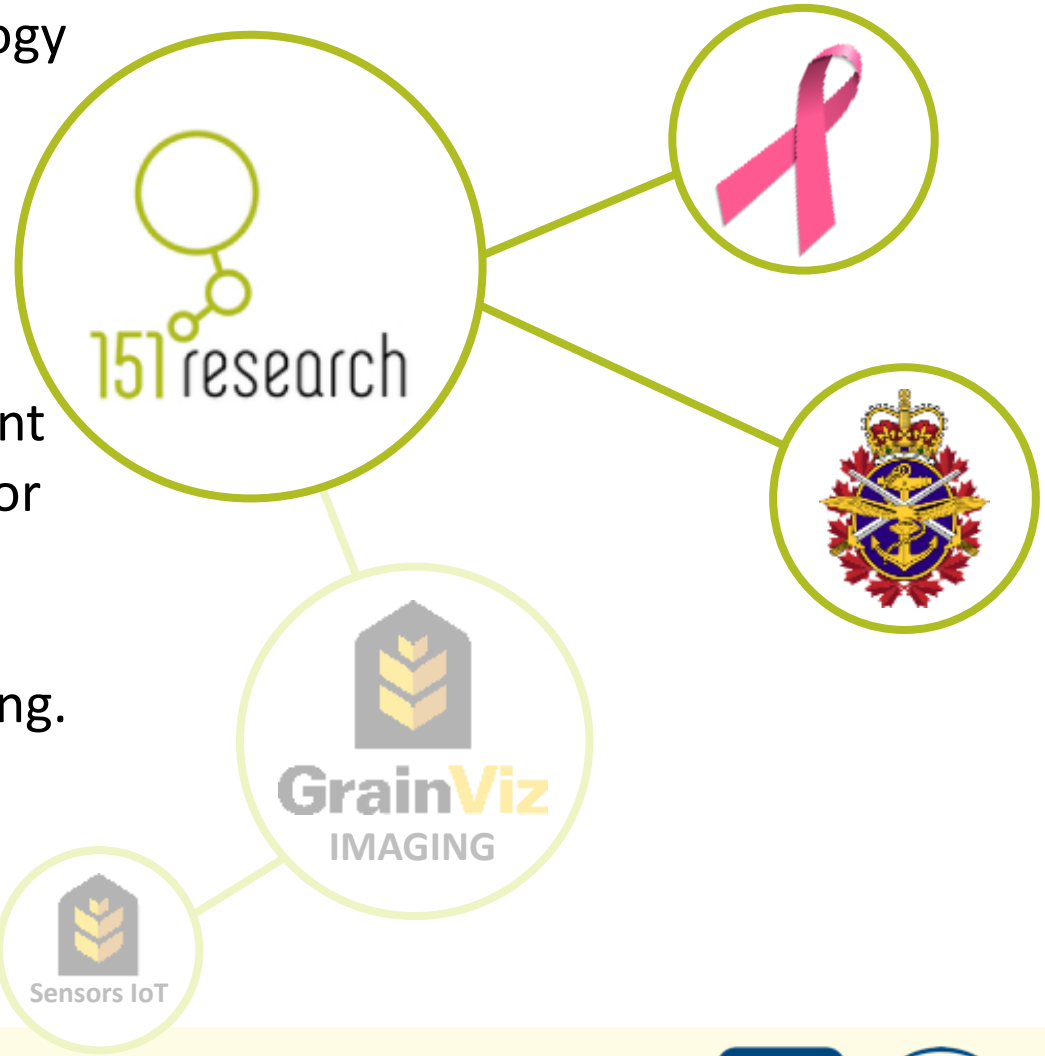
GrainViz

OUR HISTORY

INTRO TO 151 RESEARCH AND OUR ROOTS

- Founded in 2011, 151 Research is a research and technology incubator which funds, develops and commercializes industry leading and innovative technology in remote and advanced sensors, data analytics, and electromagnetic imaging.
- Past several decades focused on research and development for a lower cost and frequency method similar to an MRI or a CT scan.
- Past 3 years scaling it for breast cancer and medical imaging.
- Developed remote and advanced sensing technology for the defence, arctic and marine environment.



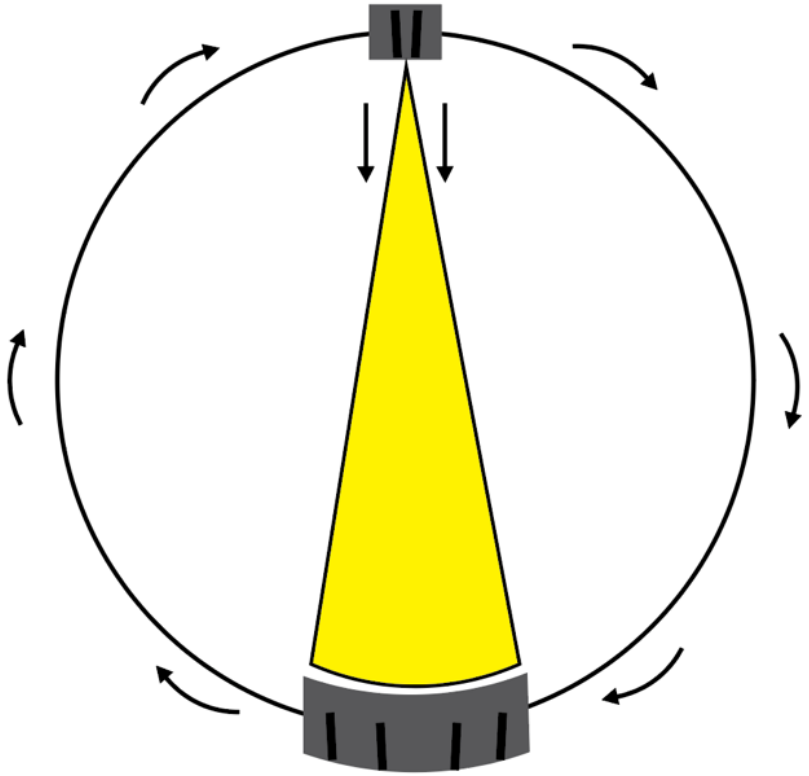
GRAINVIZ IMAGING

SIMILARITIES BETWEEN MRI OR CT SCAN & GRAINVIZ IMAGING

GrainViz

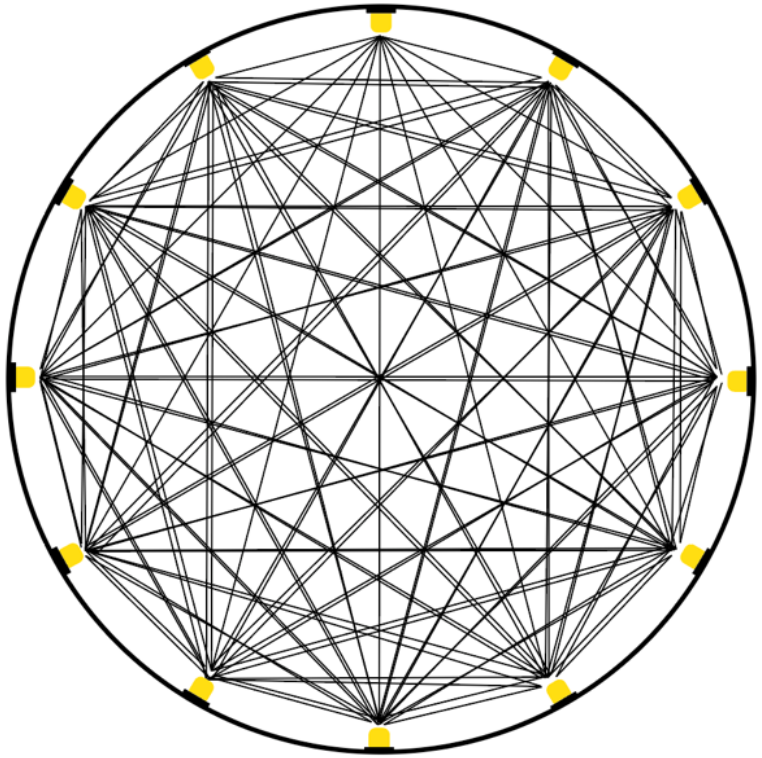
MRI/CT TECHNOLOGY:

- Send radio waves from a transmitter to a receiver; however both are circling remaining the same distance apart, almost chasing each other round and round



GRAINVIZ IMAGING TECHNOLOGY

- Unlike MRI/CT scans, Grainviz Imaging sensors are anchored in different locations, each sensor sending and receiving signals from the 24 other sensors located around the bin as seen below



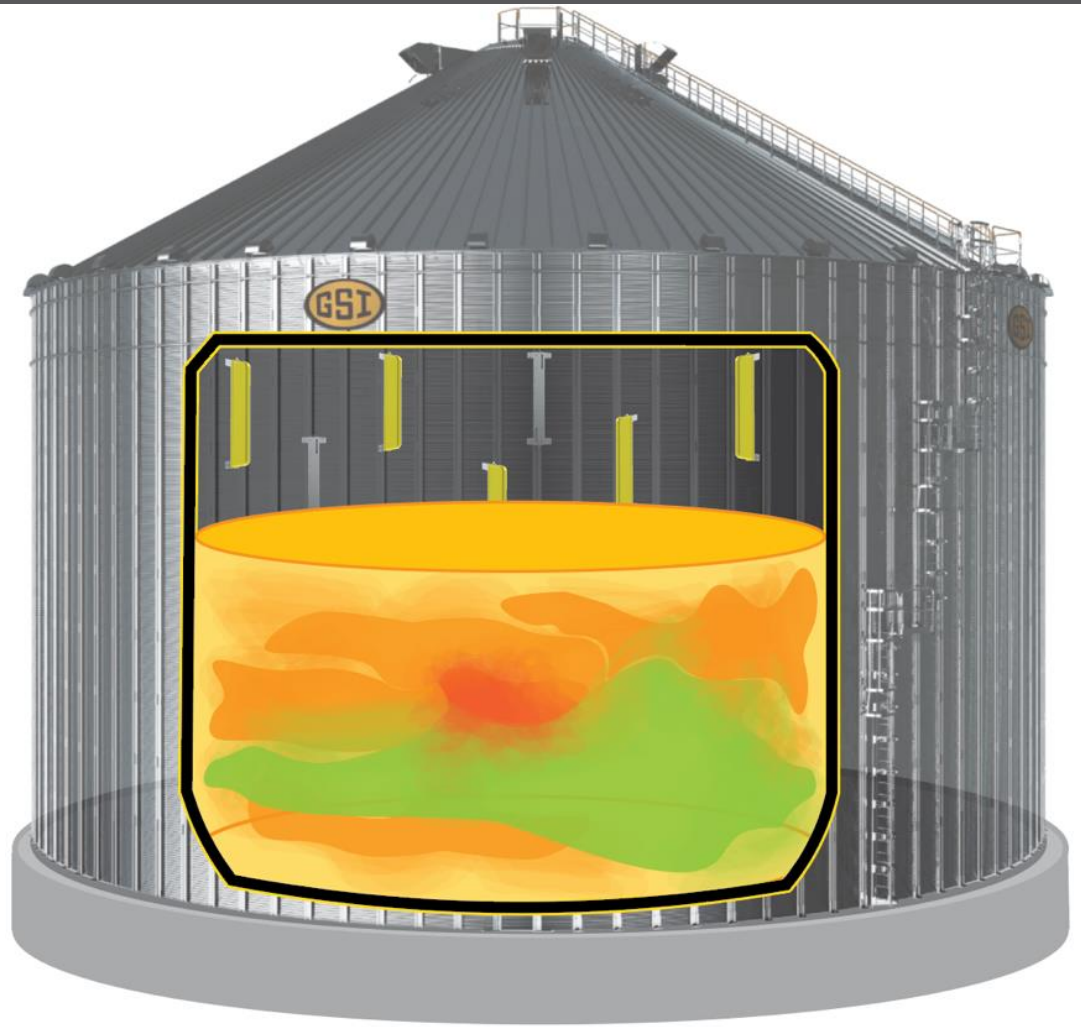
GRAINVIZ IMAGING

3D RADIO WAVE IMAGING TECHNOLOGY

GrainViz

GrainViz from GSI uses this advanced medical technology to:

- Create a 3D image map showing the moisture content of each individual bushel of grain
- View the location of each bushel in the bin
- Maximize weight
- Accurately measure inventory levels
- Proactively address potential issues before they become a problem

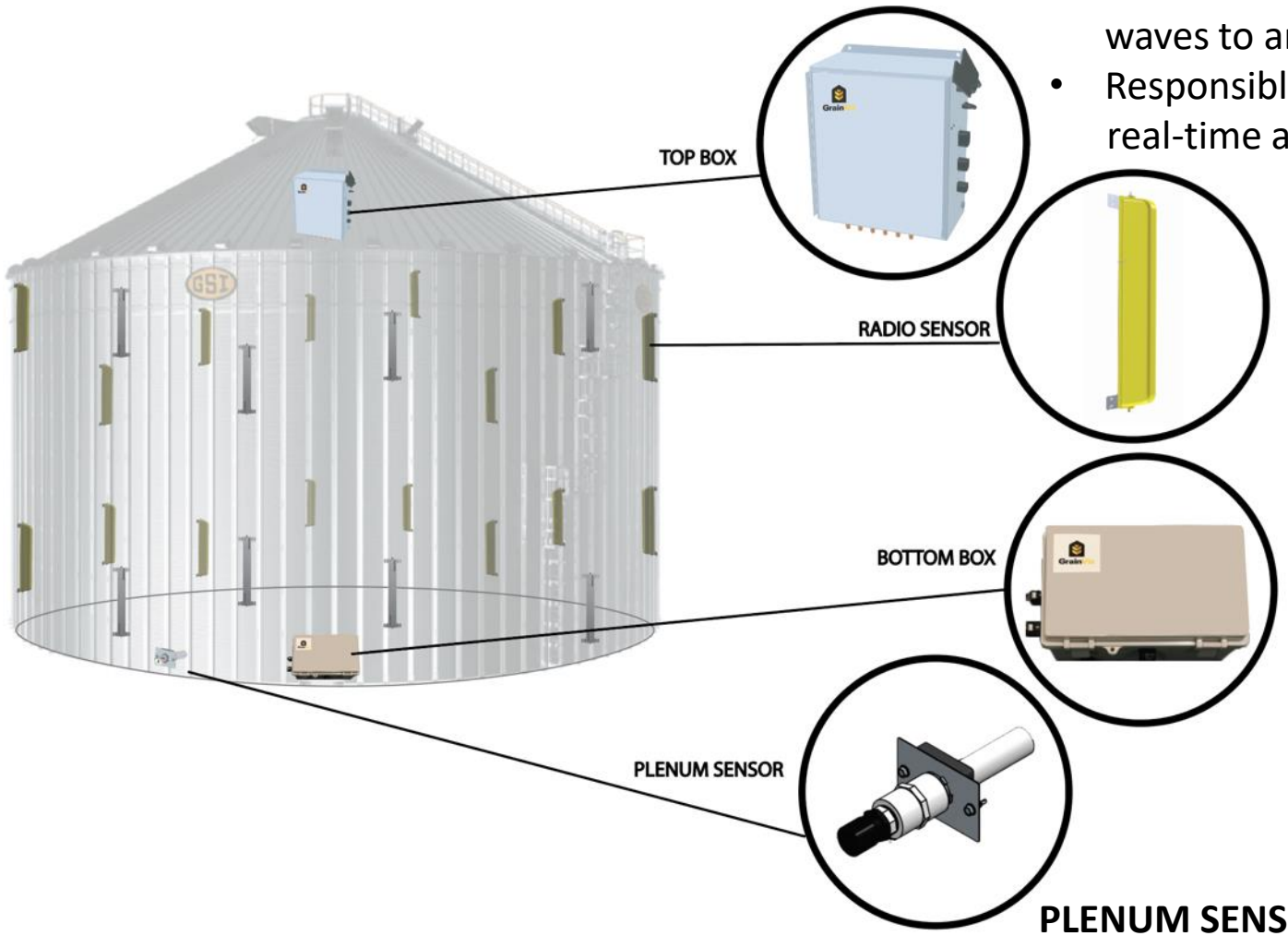


GRAINVIZ IMAGING DEMO

HOW IT WORKS: ANIMATION

GRAINVIZ IMAGING

MAIN GRAINVIZ IMAGING COMPONENTS



TOP BOX

- Houses the electronics for transmitting and receiving radio frequency waves to and from sensors inside your bin.
- Responsible for the communication functions which provide you the real-time access of your bin.

RADIO SENSOR

- 24 sensors installed on the inside of a bin.
- Sensors transmit radio waves through the grain in the bin.
- Cableless system that provides you with accurate moisture content, positioning data, and detailed inventory reports.

BOTTOM BOX

- This box contains your power components
- Collects plenum sensor data (temperature, moisture and pressure conditions in the bin)
- Integrated outdoor temperature and moisture sensor which provides you with a bin specific weather station.

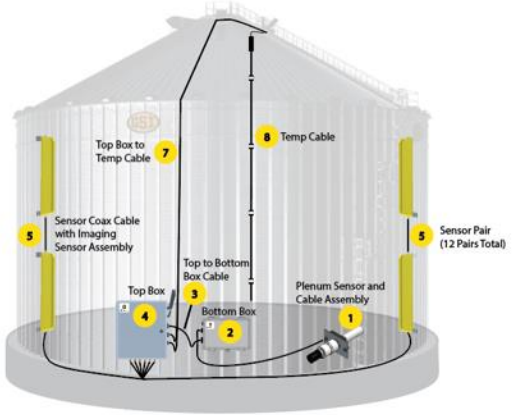
PLENUM SENSOR

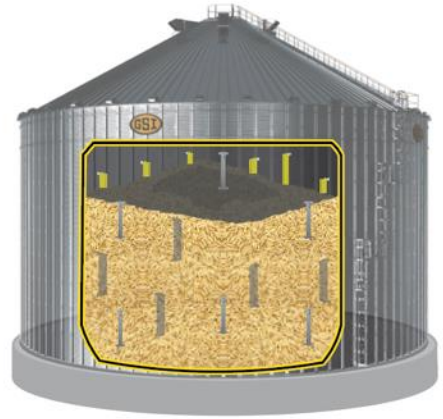
- This sensor collects temperature & pressure data inside & outside the bin

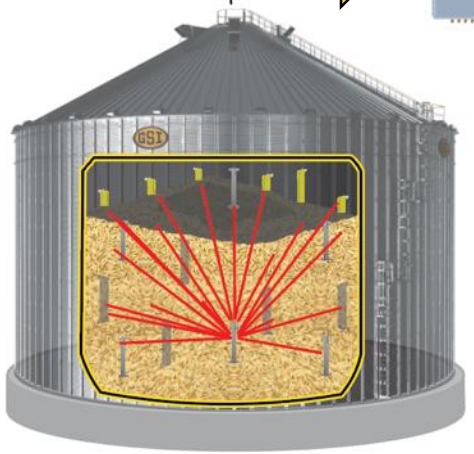
HOW IMAGING WORKS

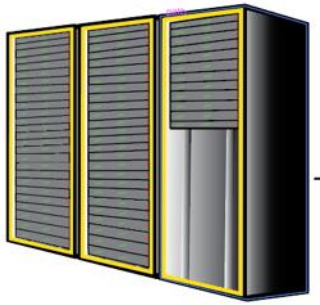
STEP BY STEP BREAKDOWN

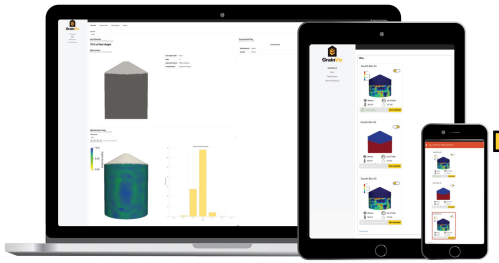
GrainViz

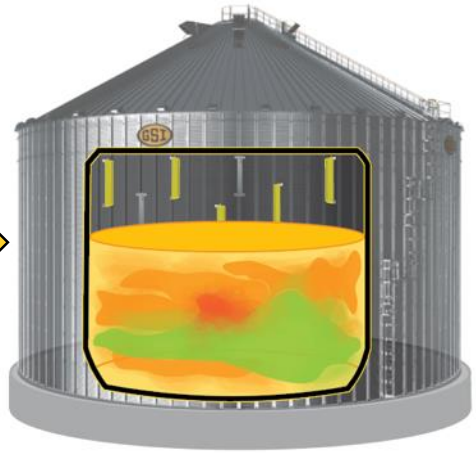












GRAIN MONITORING LANDSCAPE

CABLE MONITORING IS CROWDED WITH DATED TECHNOLOGY

GrainViz

Reactive vs. Preventative

Tri-States Grain: Primarily known for analog cables in over 40 countries with a focus on large commercial sites

Purchased by Calain group, primarily in W. Canada with GrainX brand outside of Canada

For over 20 years iGrain has been providing silo monitoring in Europe and S.E. Asia. Very dated technology and UI/UX

Recently purchased by AGI, and former OPI dealer, Complete suite of monitoring products

Founders of the cable monitoring market with over 35 year in business,. Global footprint.

3d Radio Wave Imaging proprietary technology to provide the most comprehensive monitoring in the industry

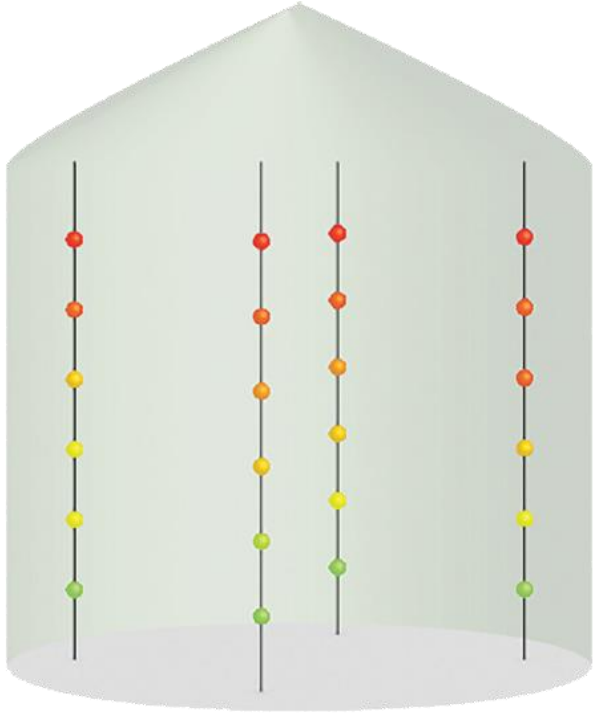
CABLE VS IMAGING MONITORING

COMPARING GRAINVIZ'S IMAGING TECHNOLOGY TO TRADITIONAL CABLES

GrainViz

Imaging Monitoring:

- 100% moisture monitoring
- Proactively monitor bin
- Monitor and manage each individual bushel
- Quick and accurate inventory reporting
- Detect human, insect and rodent activity
- No restrictions on bin size or length
- Fumigation resistant technology
- Cableless system – no roof load



Imaging Monitoring:

- Only 3-5% of bin content moisture monitoring
- Reactive monitoring
- Monitor only a small radius around each sensor
- Estimated inventory level based on sensor in grain
- Can detect insects after there is an issue
- Restricted to 85’ moisture cable length
- Cables damaged by fumigation
- Heavy roof load for cable support

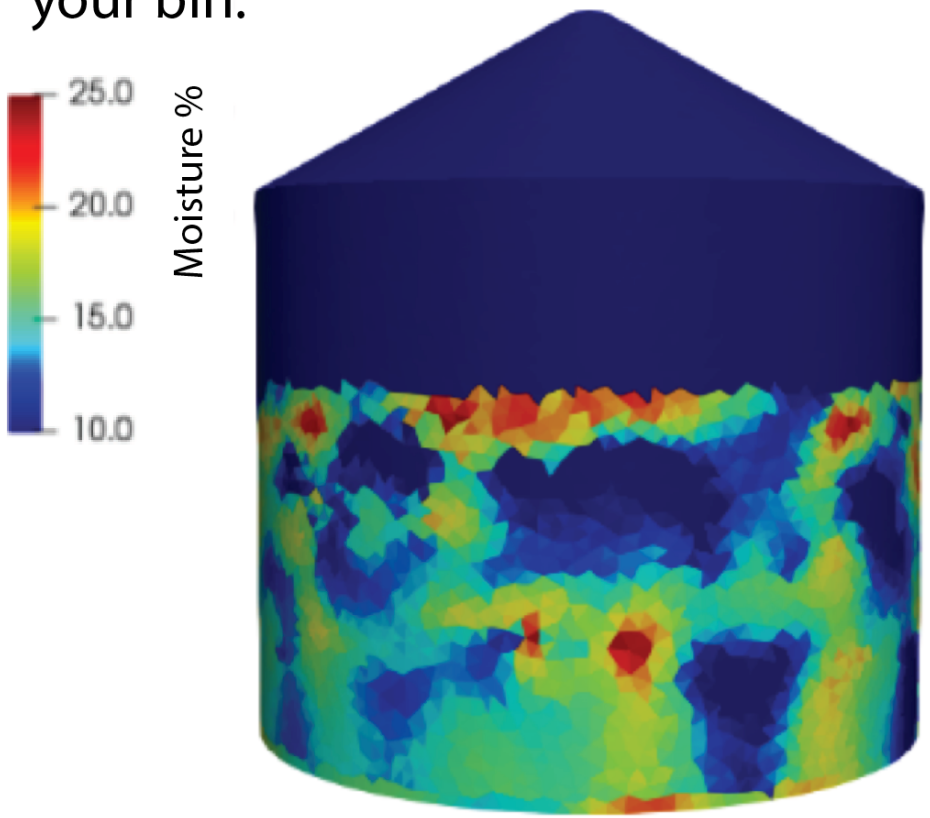
CABLE VS IMAGING MONITORING

COMPARING GRAINVIZ'S IMAGING TECHNOLOGY TO TRADITIONAL CABLES

GrainViz

The GrainViz System

With the GrainViz system you can view 100% of the moisture content within your bin.



Traditional Cable Systems

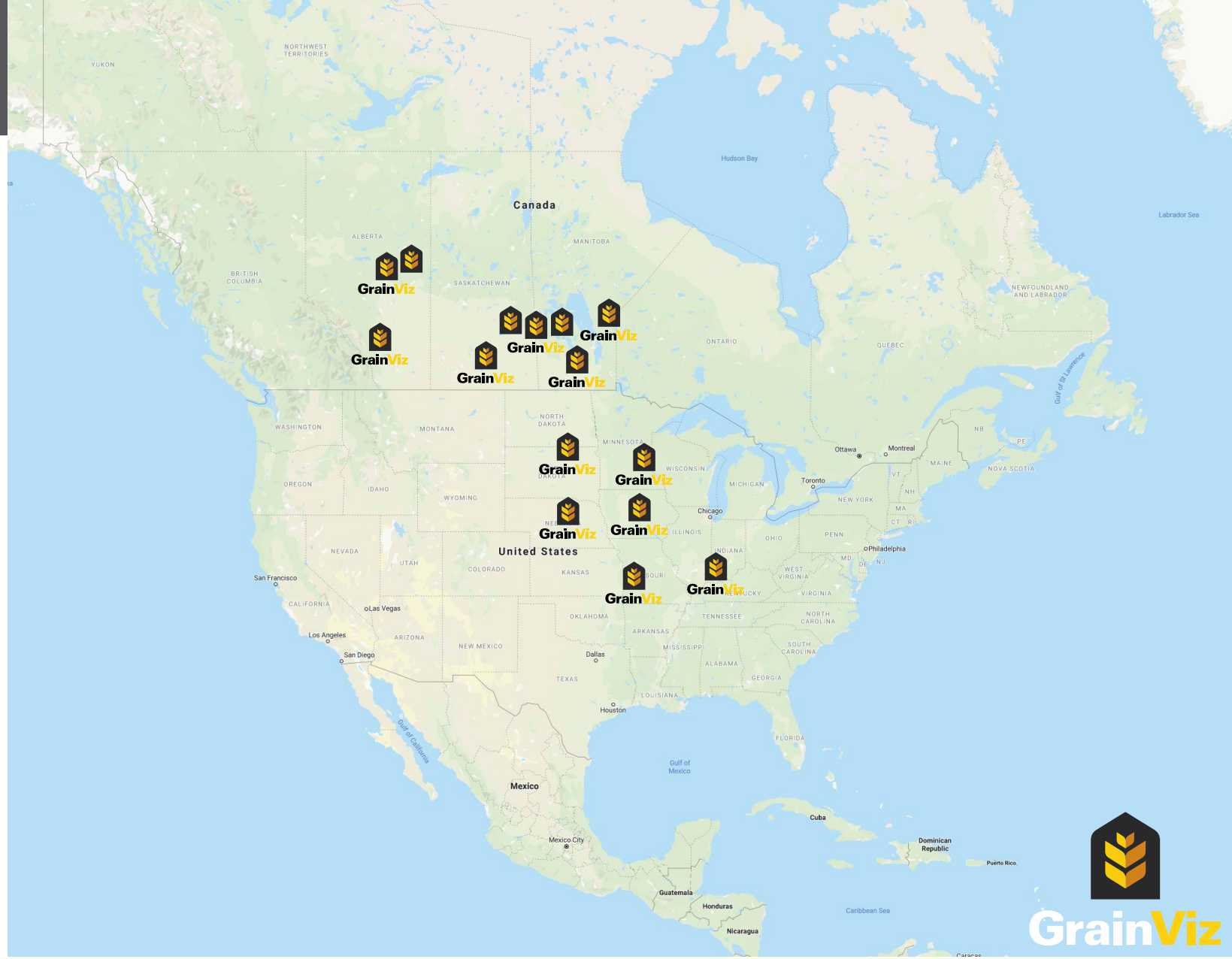
Traditional cable systems only allow you to view the grain in close proximity to your cables.

	C1	CM2	C3	C4	C5	C6
S18	62.2					
S17	60.5					
S16	57.5					
S15	55.8					
S14	62.1	57.1	58.2	56.9	59.3	58.7
S13	124.1	54.5	55.1	55	56.4	55.9
S12	141.1	53	52.6	50	49.4	53
S11	119.5	50.3	48.4	47.9	47.8	47.7
S10	93.9	48.7	47.7	47.6	47.5	47.7
S9	75.2	50.1	48.7	49.5	49.6	49.7
S8	72.9	50.3	50.2	50.1	50	49.6
S7	75	50.2	49.1	49.3	50.3	51.3
S6	63.6	62.1	51.6	56.7	60.3	62
S5	62.7	65.7	60.1	63.8	65	64.9
S4	56.7	64.6	63.9	63.8	64	63.7
S3	62.6	65.6	65.3	64.1	64.5	64.4
S2	69.4	65.2	64.2	63.6	64.2	64.2
S1	68.4	64.7	64.6	64.4	64.7	64.5

2019 ALPHA SITES

14 Alpha sites have been installed in North America in 2019

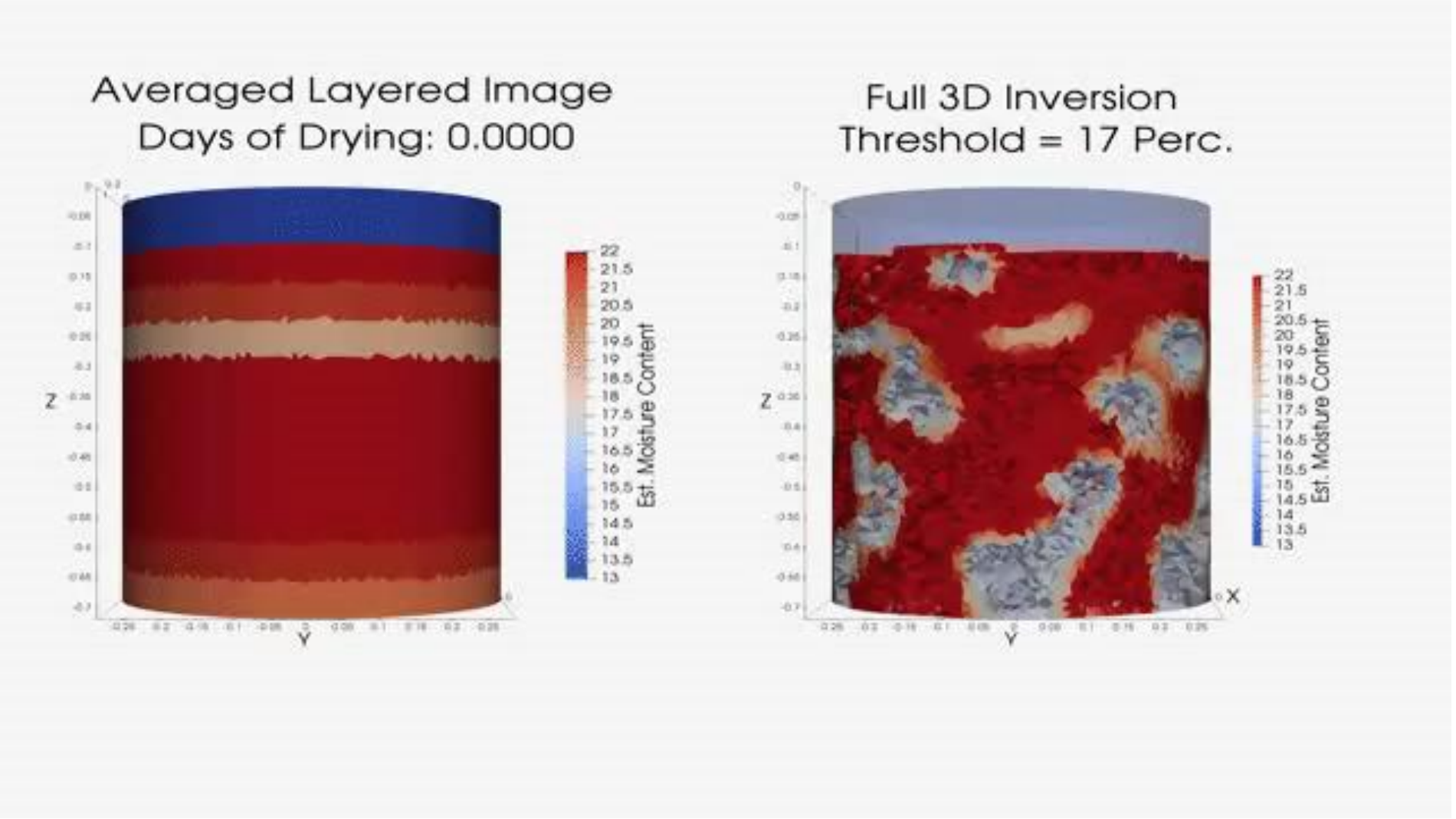
Each site specifically chosen to represent all major commodities and bin sizes

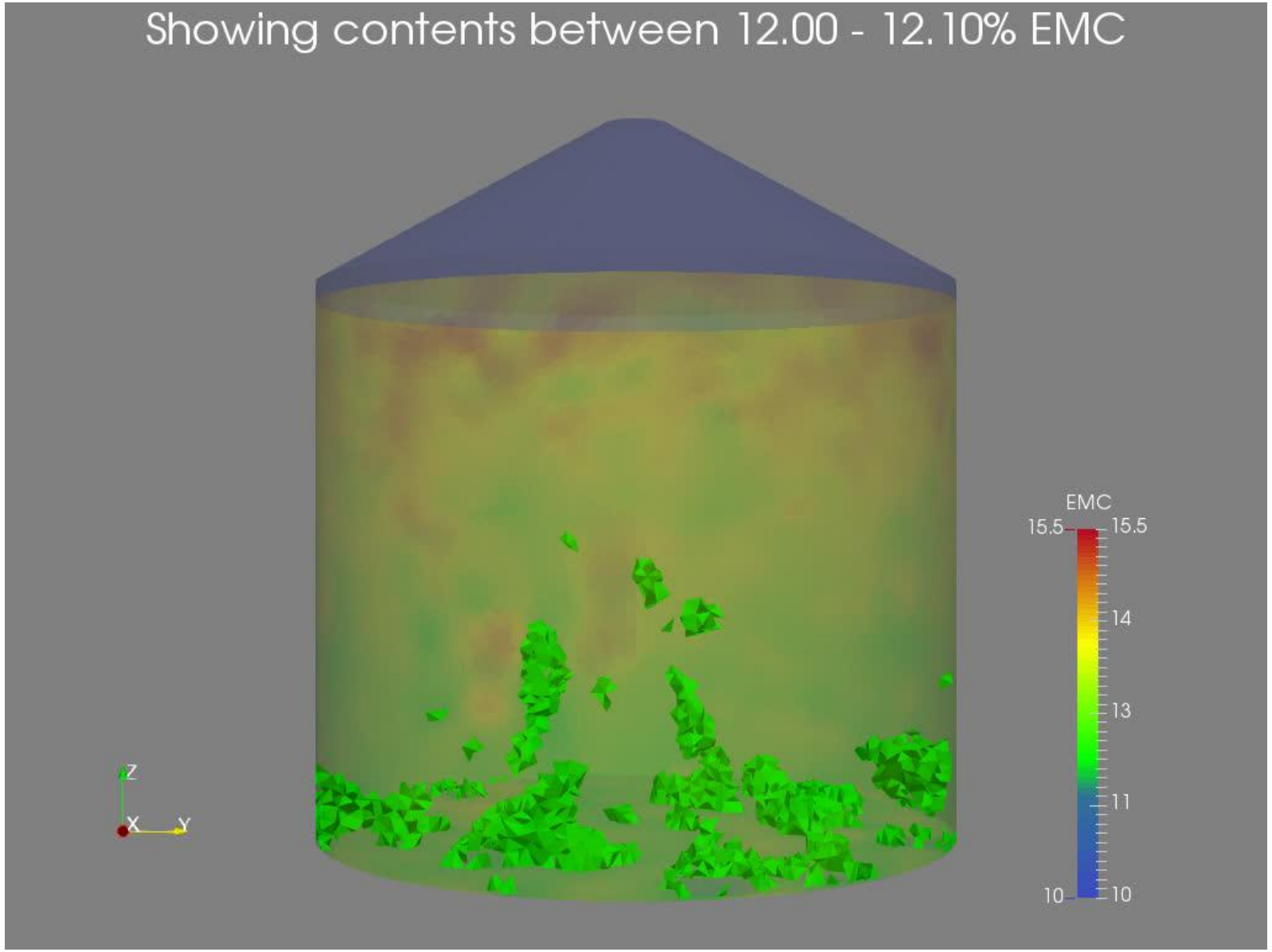


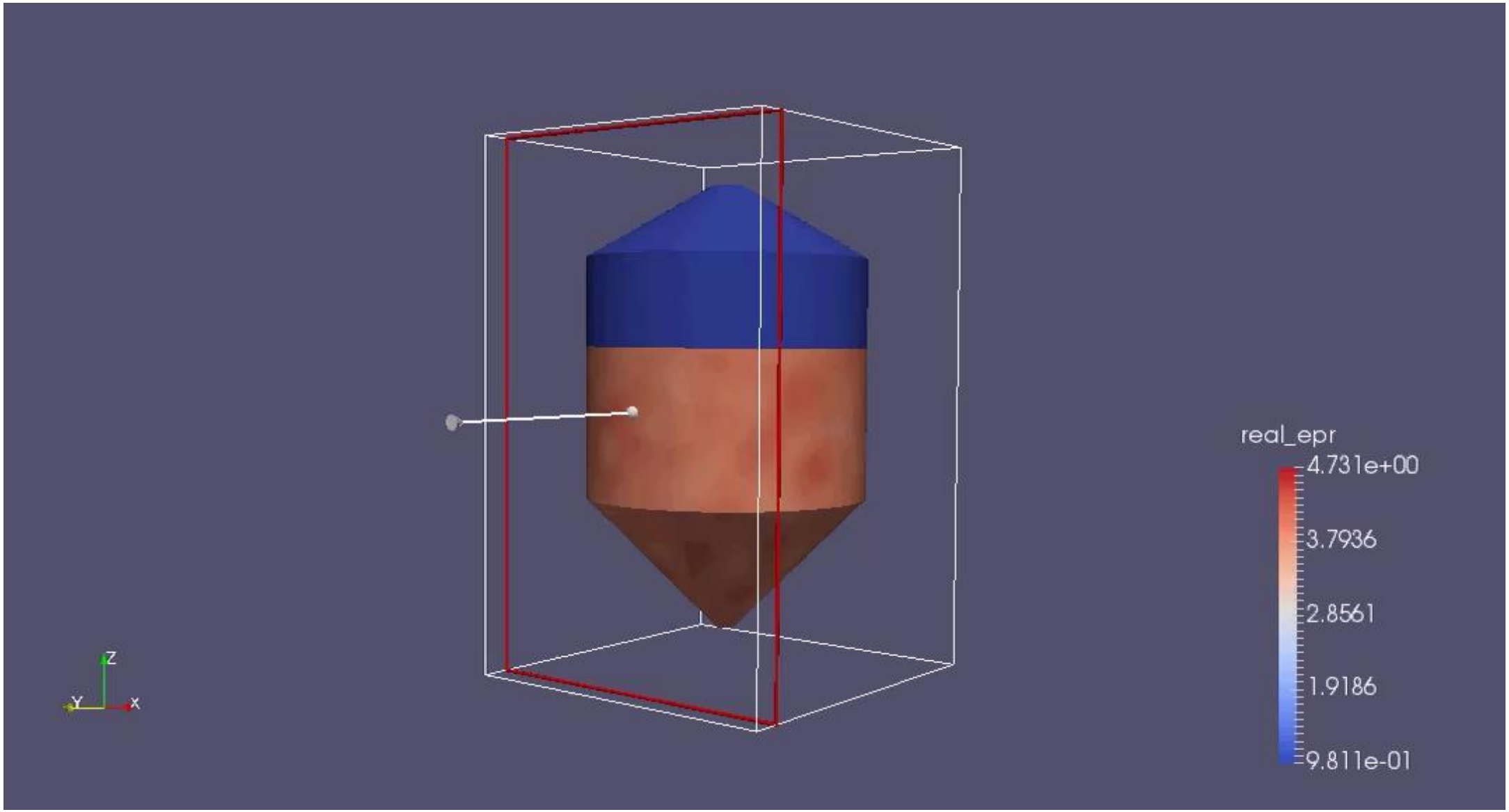
CABLE VS IMAGING MONITORING

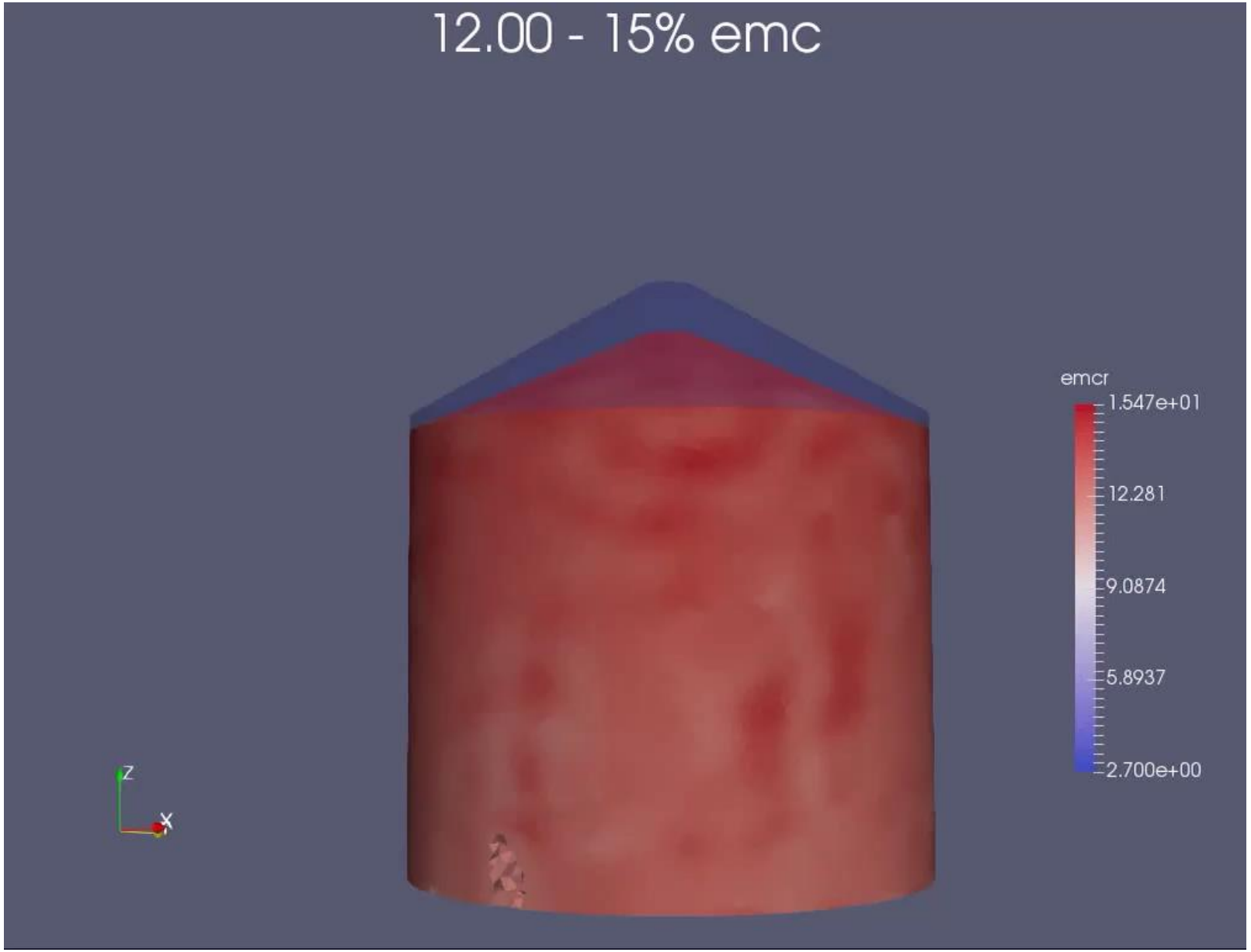
COMPARING GRAINVIZ'S IMAGING TECHNOLOGY TO TRADITIONAL CABLES

GrainViz



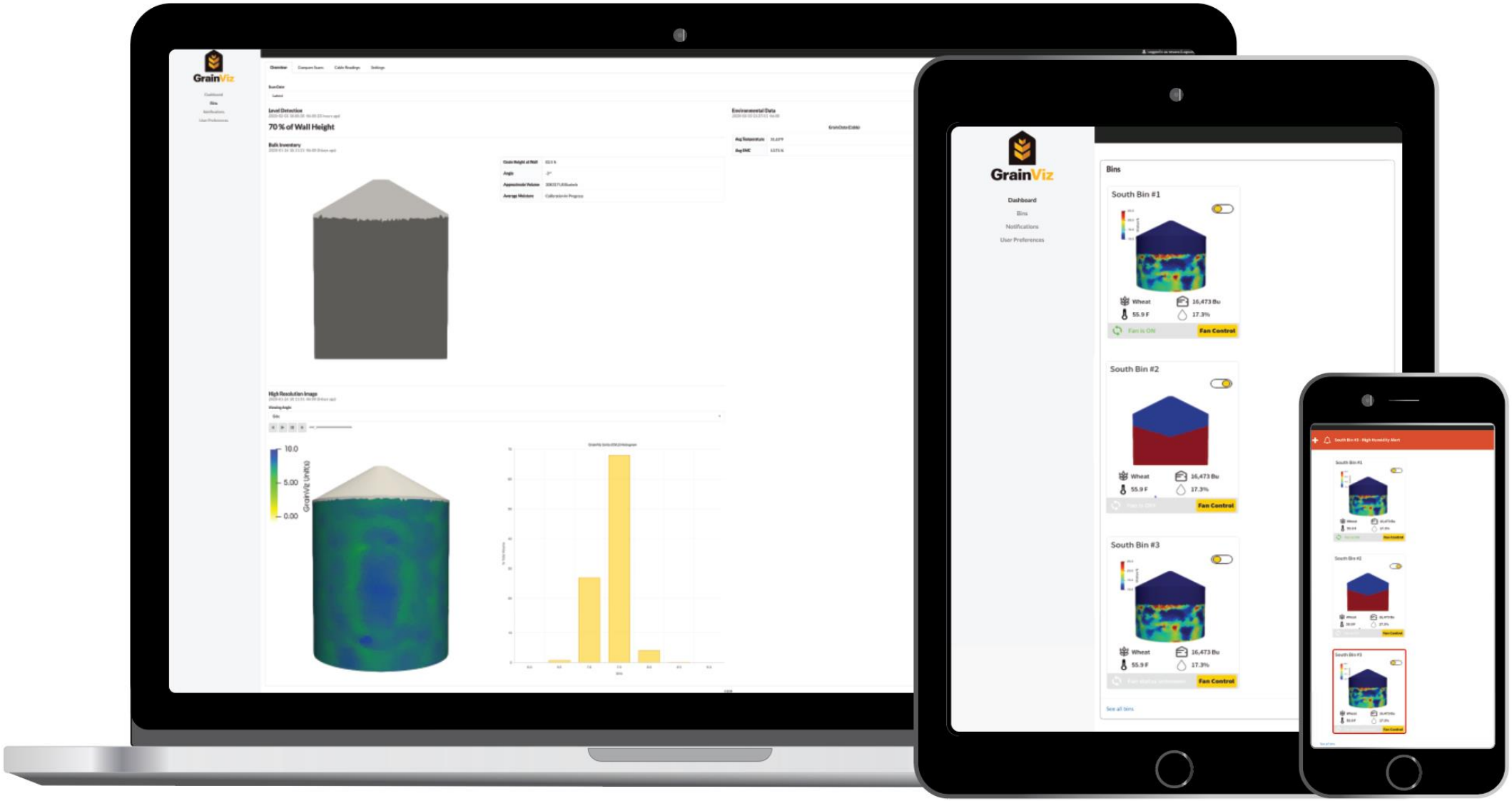

Showing contents between 12.00 - 12.10% EMC
EMC
15.5
15.5
14
13
11
10
10
Z
X
Y


real_epr
4.731e+00
3.7936
2.8561
1.9186
9.811e-01
Z
Y
X


12.00 - 15% emc
emcr
1.547e+01
12.281
9.0874
5.8937
2.700e+00
Z
X

GRAINVIZ IMAGING USER PORTAL

GrainViz



GV Portal

GrainViz

Williams

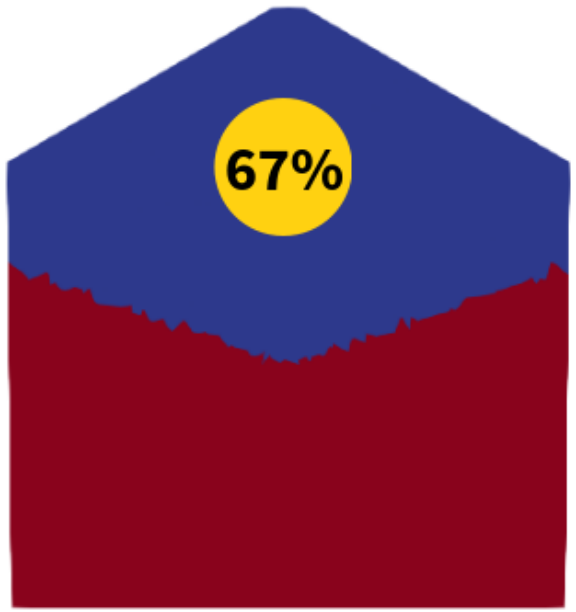
North - Bin #1

High Res Moisture | **Inventory** | Cables | Analysis | Alerts | Controls | Settings

- Dashboard
- Bins
- Notifications
- Event Log
- Team
- User Preferences

Inventory

Latest - 2019-12-12:50 (1 hour ago)



Inventory History

Grain Height at Wall	**23.38 ft**
Angle of Grain	**12**
Approximate Volume	**55600 US Bushels**

Commodity
Updated: 2019-12-12:50 (1 hour ago)
Wheat
16,473 Bu
55.9 F
17.3%

Outside Weather
Updated: 2019-12-12:50 (1 hour ago)
48.5 F
28.3%

Fan
Updated: 2019-12-12:50 (1 hour ago)
OFF
Last: 5 hours ago

GrainViz | Pricing Convention

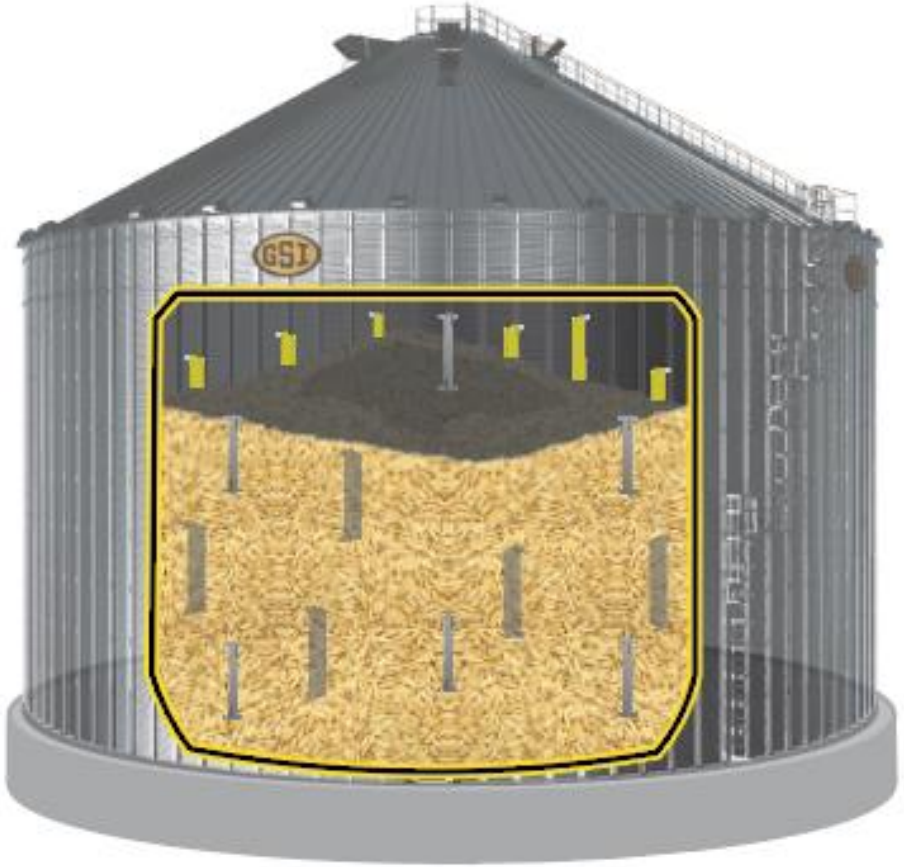
0 - 48	49 - 72	73 - 156
$20,000 USD	$35,000 USD	$50,000 USD

Annual Subscription Fee	Monthly Cell Data Usage Fee	Charge Per Additional Image
$200	$50	$10

PRICING COMPARISON

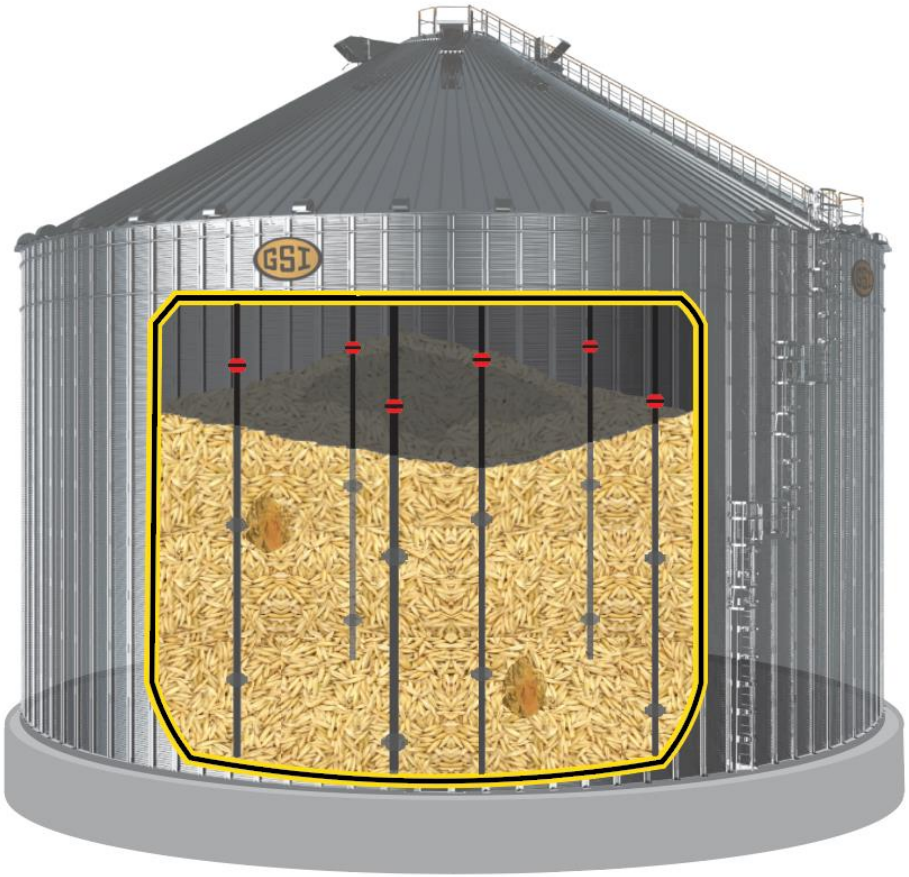
GRAINVIZ'S IMAGING VS CABLE MONITORING 12500MT BIN (10526)

GrainViz



$20,000 USD per Bin:

- 100% moisture monitoring

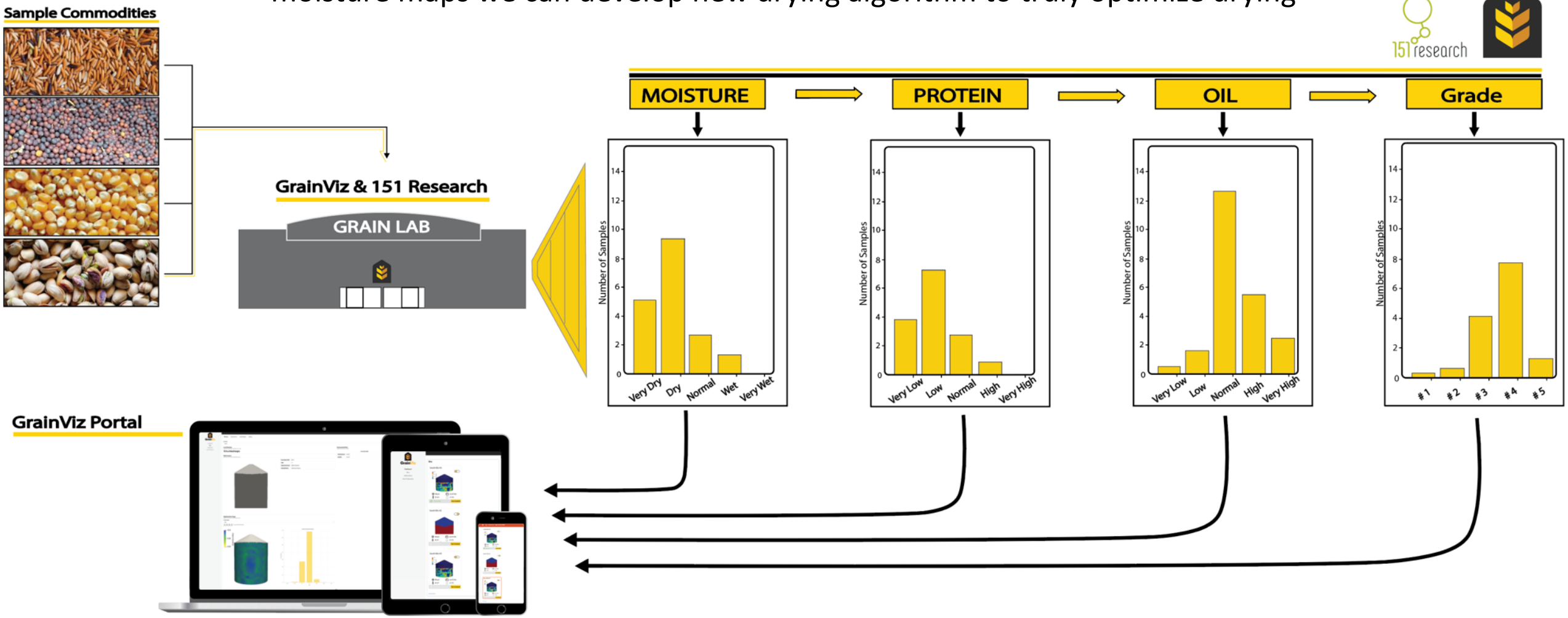


$18,371 USD per Bin for an OPI system:

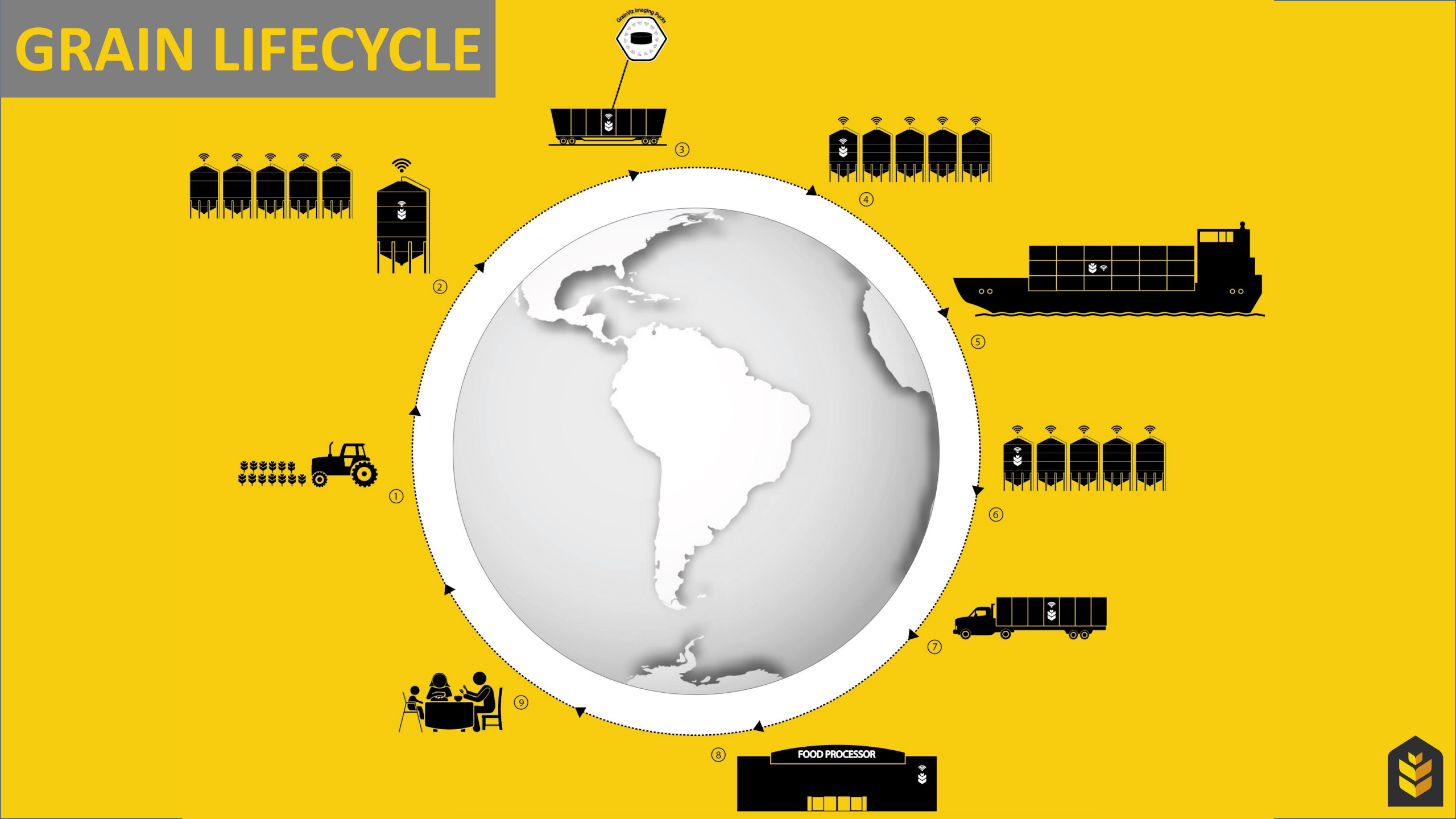
- No moisture monitoring due to height restriction

GRAIN LAB

GrainViz has been building our own grain lab to further enhance and provide more accurate moisture images within the GrainViz system. Current models are outdated and limited and do not work for all commodities. With full 3D moisture maps we can develop new drying algorithm to truly optimize drying



GRAIN LIFECYCLE



AWARD WINNING TECHNOLOGY

BEST IN CLASS AND INDUSTRY LEADING TECHNOLOGY

2018 AE50 Award

The GrainViz system received a 2018 AE50 award from the American Society of Agricultural and Biological Engineers for being ranked highest in innovation, significant engineering advancement and impact in the agriculture market

Agri-Trade Innovation of the Year Award 2018

GrainViz's technology was awarded Agri-Trade's 2018 Innovative Technology award for it's ground breaking and proven technology contribution for the agriculture industry

AGCO's GSI & GrainViz Brand Partnership

AGCO (NYSE: AGCO), and 151 Research announced an exclusive technology partnership to improve grain quality by changing the way grain is monitored and managed. This partnership will accelerate GrainViz's distribution and consumer adoption through leveraging AGCO's global channel and customer network

PLANS FOR 2020

GrainViz

Plans further enhance the GrainViz System:

- Hotspot development monitoring
  - By introducing a high moisture region in dry grain background, we aim to monitor how that hotspot reacts when the fans are powered on
- Phantom burial + Air void detection
- Insect activity monitoring in a controlled environment experiment
- Drying front monitoring at University of Manitoba labs

THANK YOU

Say HELLO

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