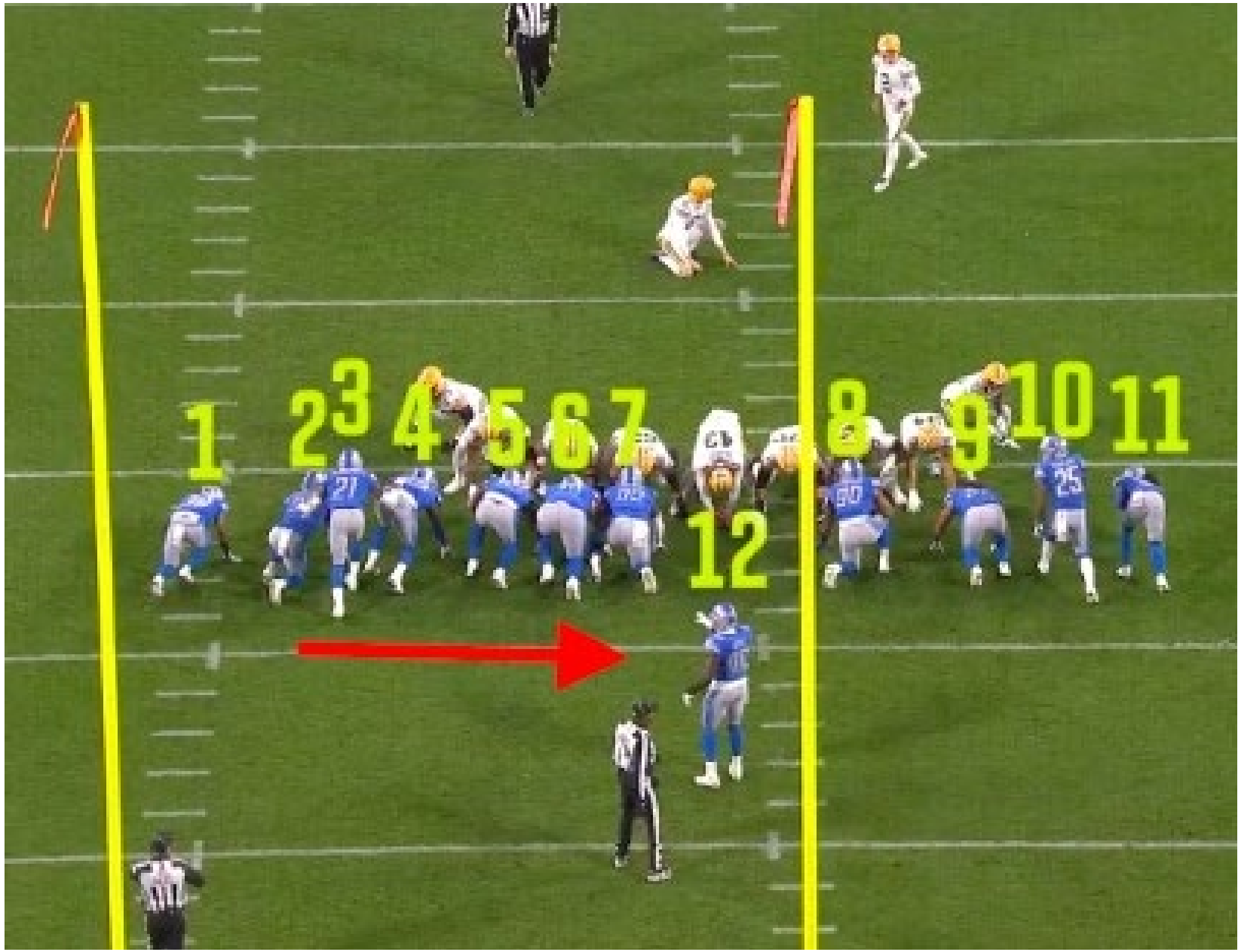


Cold Chain Management in Potatoes

Keith Tinsey





Choices



Execution and Best Practices

- Nothing is ever black and white – it's a distribution
- Hitting the Sweet Spots
- Handling Damage
- Pressure Bruise



The System

- Soil to Consumer

- Growing
- Harvesting
- Transport
- Storing
- Transport
- Processing or Packing
- Transport
- Dist. Center
- Transport
- Grocery Store
- Consumer

Opportunity - Grower

Opportunity – Handling

Opportunity – Multiple Entities



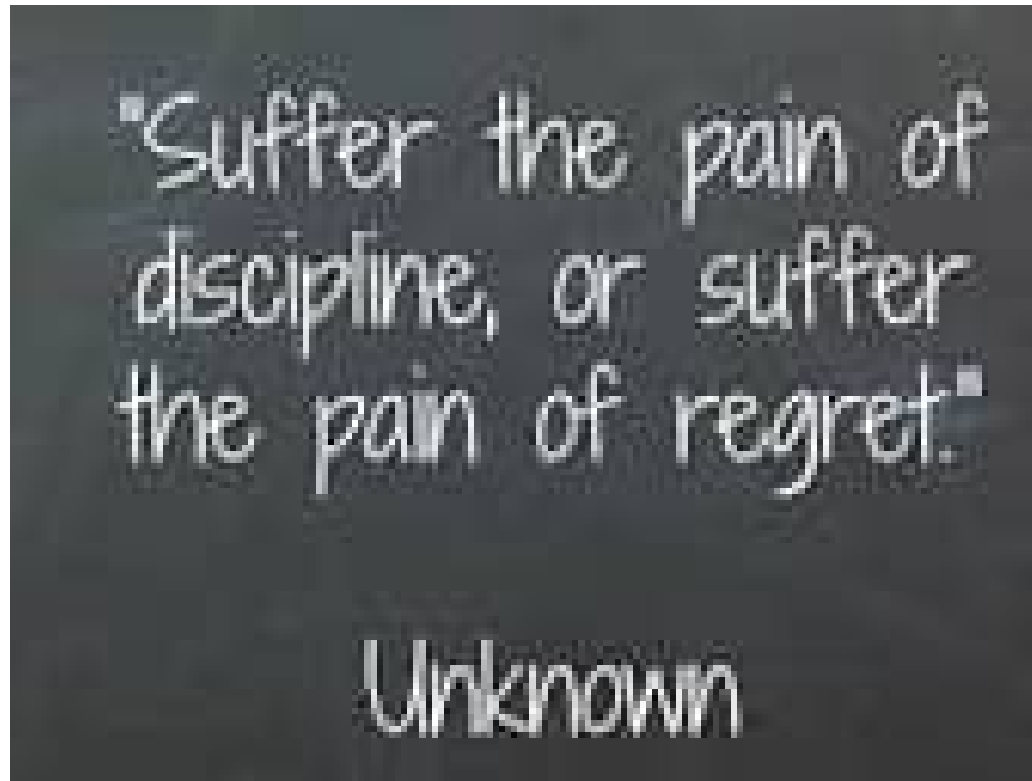
Increase Success / Reduce Risk

Crop Volume
(cwt. or tons)



Handling - Execute the fundamentals

- Have your equipment bruise free ready before each day
 - Adjust on the fly



Handling Bruise - Execute the fundamentals

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 - Adjust on the fly
- Hit your daily harvest temperature windows with discipline
 - 45F and higher
 - Don't forget about soil moisture leading up to harvest



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- Bruise free testing
 - Create a rapid feedback loop and response protocol
 - Get set early in harvest and maintain throughout



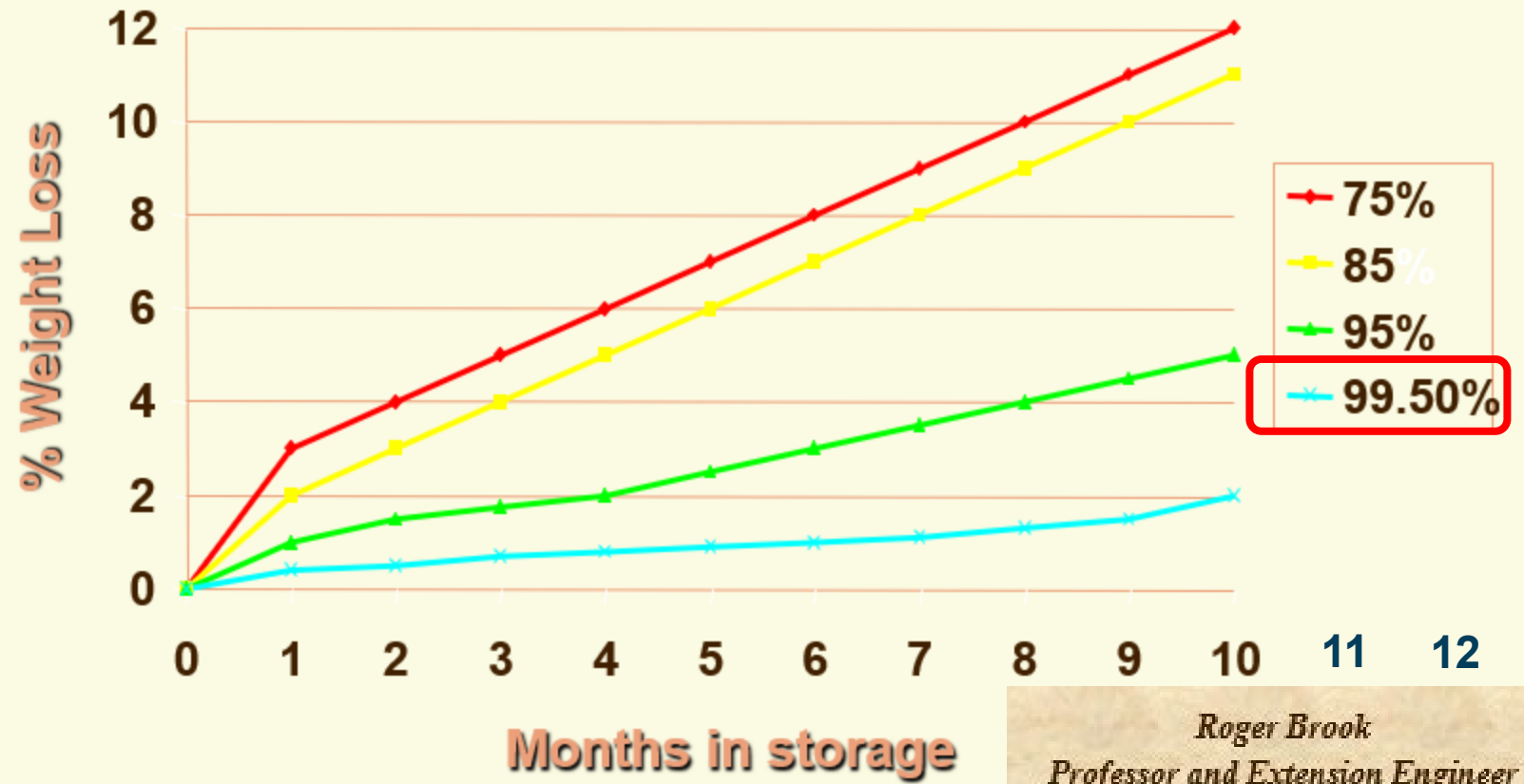
Handling Bruise - Execute the fundamentals

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 - Create a rapid feedback loop and response protocol
 - Get set early in harvest and maintain throughout
- Plenty of fundamental opportunities in wash plants and packing sheds... bruise is cumulative!



Pressure Bruise

Weight loss vs. Relative Humidity



*Roger Brook
Professor and Extension Engineer
Agricultural Engineering Department
Michigan State University*

Pressure Bruise

- ✓ Soil Moisture leading up to harvest at Harvest



Pressure Bruise

- ✓ Soil Moisture leading up to harvest at Harvest
- ✓ Minimize Skinning and Bruising



Pressure Bruise

- ✓ Soil Moisture leading up to harvest at Harvest
- ✓ Minimize Skinning and Bruising
- ✓ Cooling and Rapid cooling
 - ✓ Hit your harvest temperature windows with discipline
 - ✓ Sweet spot harvest temperature High of 60F vs 70F ?



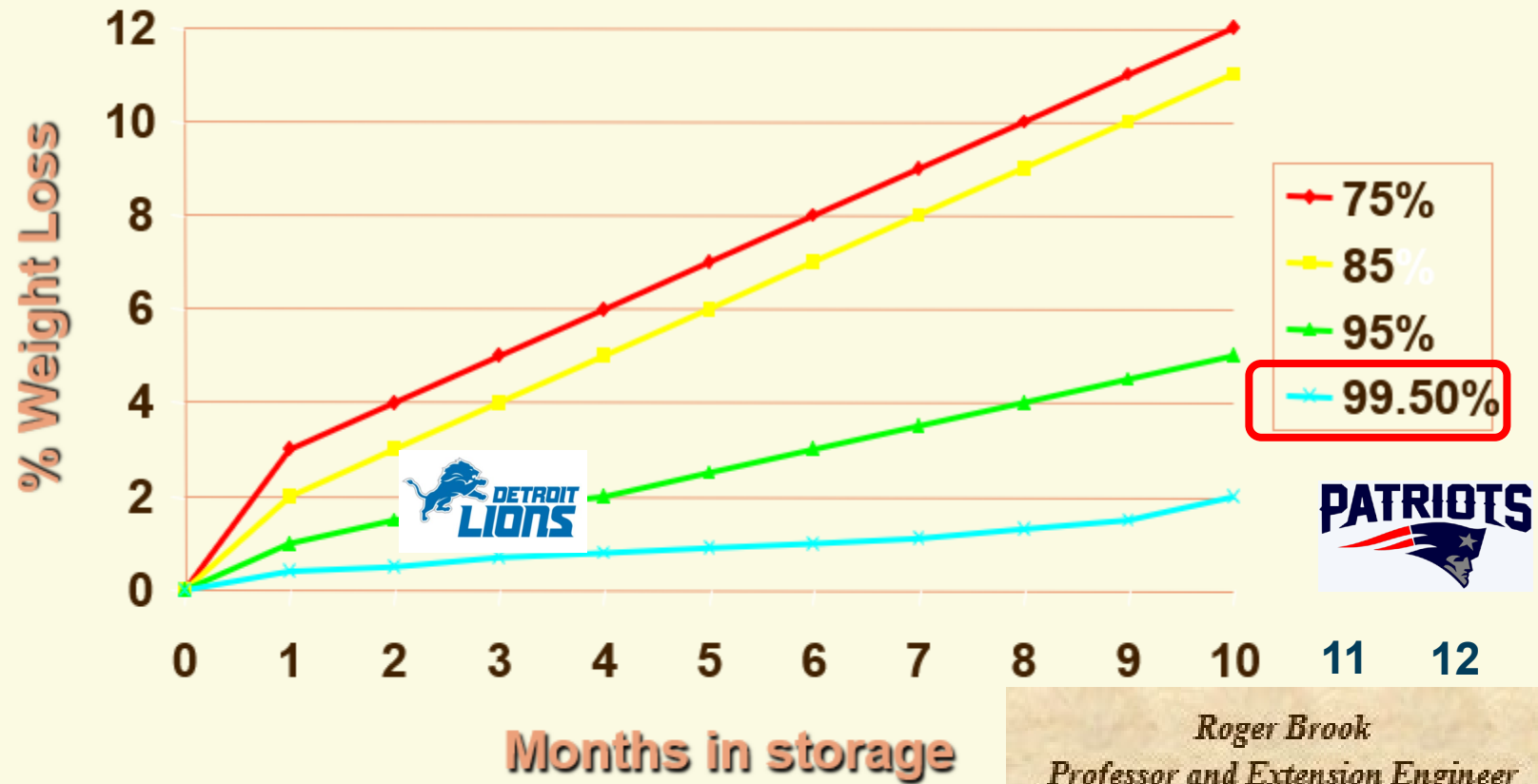
Pressure Bruise

- ✓ Storage Environment for 99.5%
 - ✓ Storage Design – conventional North American bulk storage
 - ✓ Insulated and Tight – Allows controller to do it's job... set point consistency
 - ✓ Refrigeration Capacity
 - ✓ Air Volume – minimize temp. difference from top to bottom of pile
 - ✓ Humidity Cells – Size to humidify at highest levels possible
 - ✓ Cells, spinners and foggers on RH control
 - ✓ Pro's and Con's
 - ✓ Decay/Rot i.e. Diseased or Frozen spuds
 - ✓ Uptime



Pressure
Bruise

Weight loss vs. Relative Humidity



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