THE EMERALD CONFERENCE

Produced by MJBizScience

THE EMERALD CONFERENCE

Produced by MJBizScience

Lean Cultivation:

Driving impact & profits at scale with plant-level data, AI and automation

Ian Seiferling, PhD
CEO & Co-founder, Adaviv

THE EMERALD CONFERENCE
Produced by MJBizScience

What is Lean?

What happened in 50 years? Lean Continuous Improvement

Poorly planned

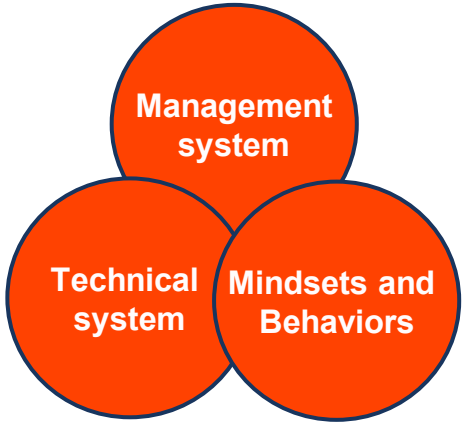
- Job specialization
- Tools on hand

Well planned and executed

- Coordination and communication
- Technological improvements

THE EMERALD CONFERENCE
Produced by MJBizScience

What is Lean?



Lean Continuous Improvement has 3 core objectives:

Drive value, operational efficiency

+

Build continuous improvement capability

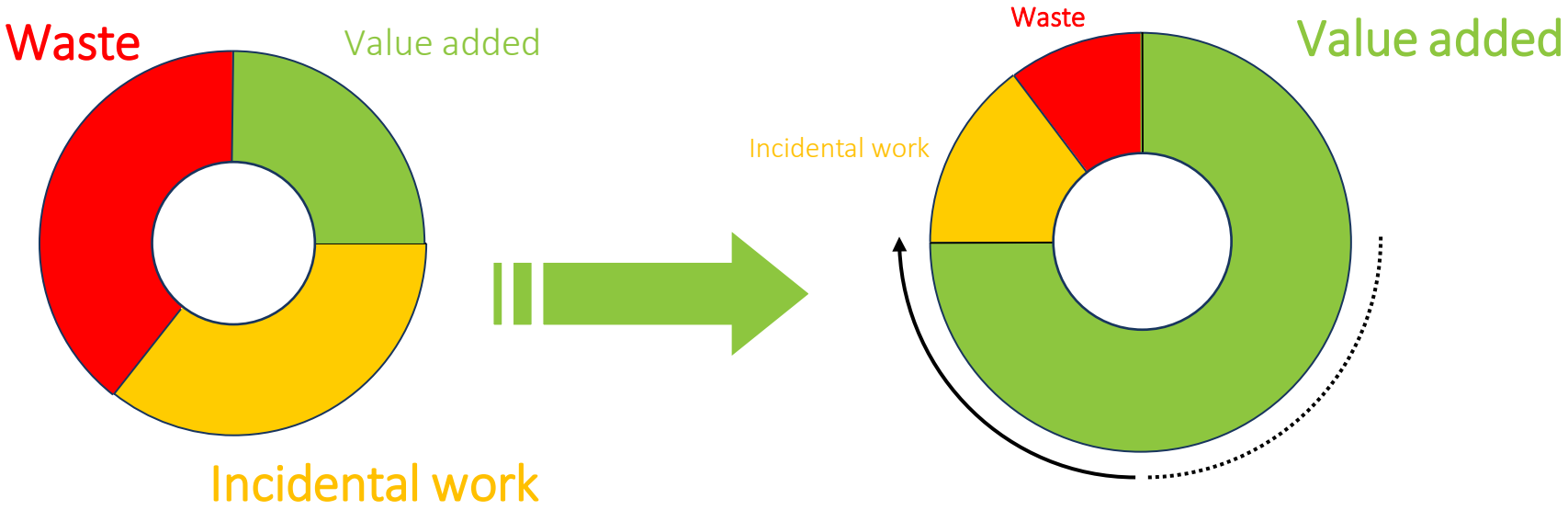
+

Transform culture

THE EMERALD CONFERENCE
Produced by MJBizScience

What is Lean?

We aim to continually focus on maximizing value-added tasks while optimizing waste and incidental time

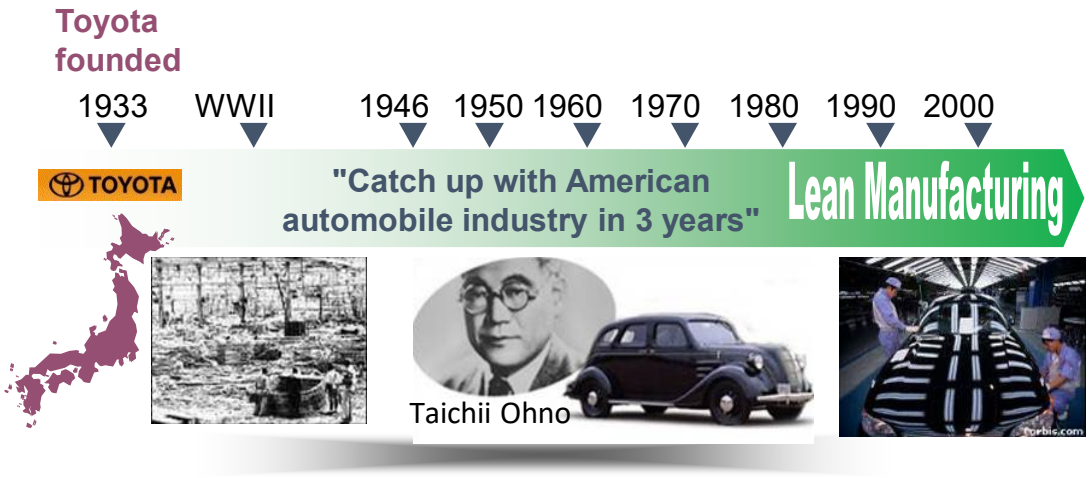


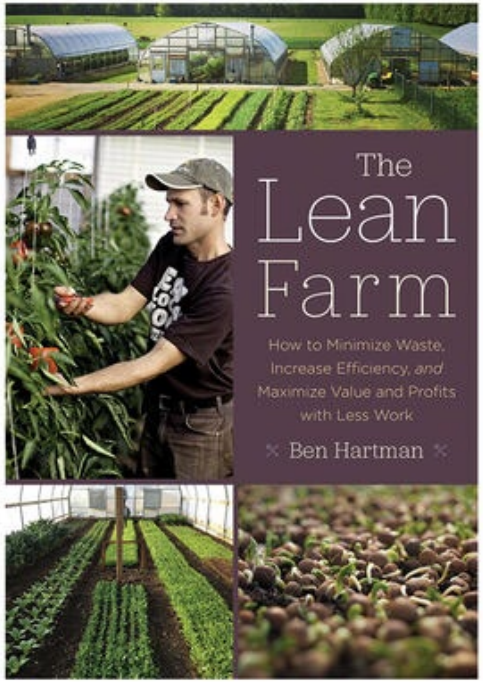
THE EMERALD CONFERENCE
Produced by MJBizScience

From cars to plants

Lean is a tool for surviving and thriving in competitive, tough markets

Toyota - mass production efficiency in a low volume, high diversity environment

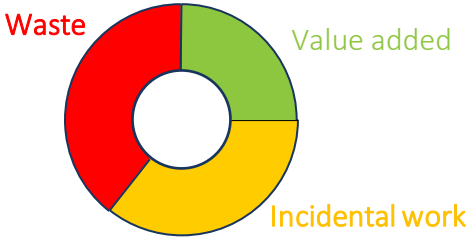


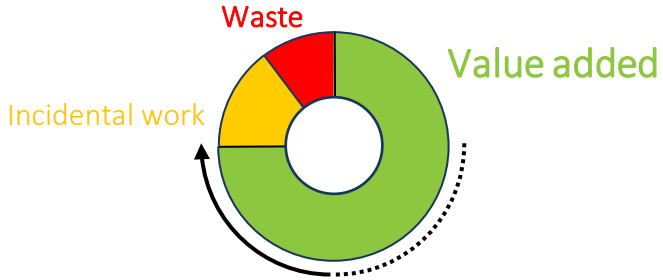


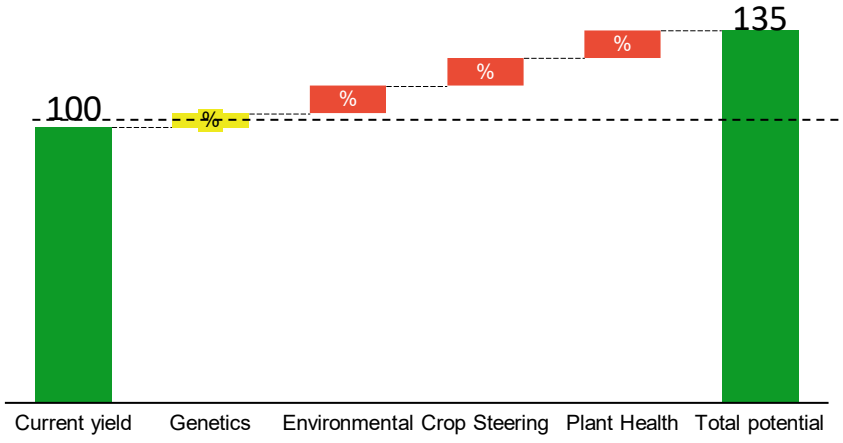
THE EMERALD CONFERENCE
Produced by MJBizScience

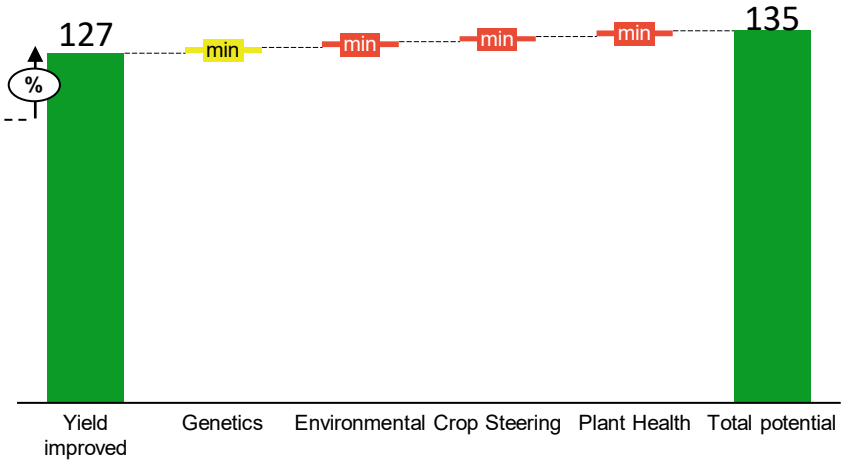
Lean Cultivation™

High variability represents the opportunity to minimize crop losses









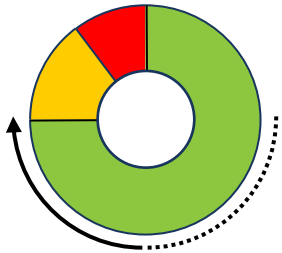
Source: Team analysis

THE EMERALD CONFERENCE
Produced by MJBizScience

Lean Cultivation™

Continuous Improvement and $Profitability

1. **Variability (g/ft², quality) =** Opportunity
2. **Data** = Understanding where opportunities lie
3. **AI + Automation =** Precision and Data at Scale
4. Simple **data-driven insights** across org.



Smart tech beats yield of China's strawberry farmers

- AI Tech team 196% + strawberries than traditional growers.
- +75% ROI gain

THE EMERALD CONFERENCE
Produced by MJBizScience

Lean Cultivation™ + Plant Empowerment

With the right technology and quality data, we can monitor plants and people and continuously improve

Data & Process Documentation:

- Photosynthetic efficiency
- Canopy density, Flowers/plant
- Growth rates
- Infection rate-pest, sensitivity
- Leaf temperature
- Gas exchange (CO_2-O_2)

KPIs:

- Dry flower/ft^2 (volume); and % of Flower-A (avg $price)
- #issues, % infected plants
- THC %
- Task hours, quality, timeliness
- Cost/plant

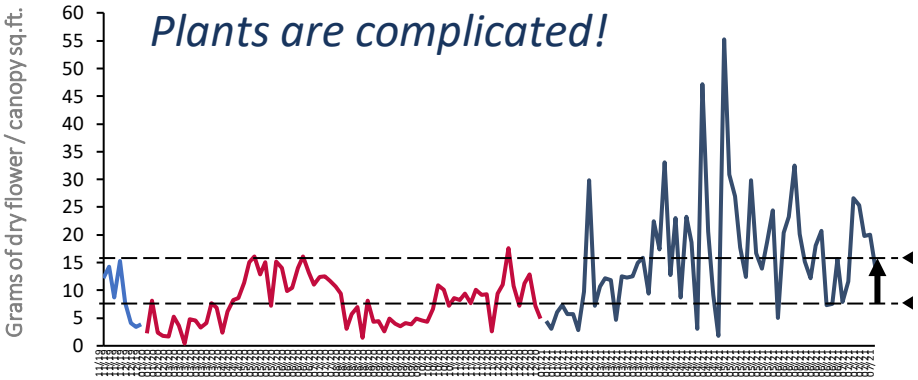
THE EMERALD CONFERENCE
Produced by MJBizScience

Lean Cultivation™

The Consistency Challenge

$1.3B lost annually to pathogens
(12% of average harvest)

How do we scale cultivation excellence while hitting cost/gram goals?

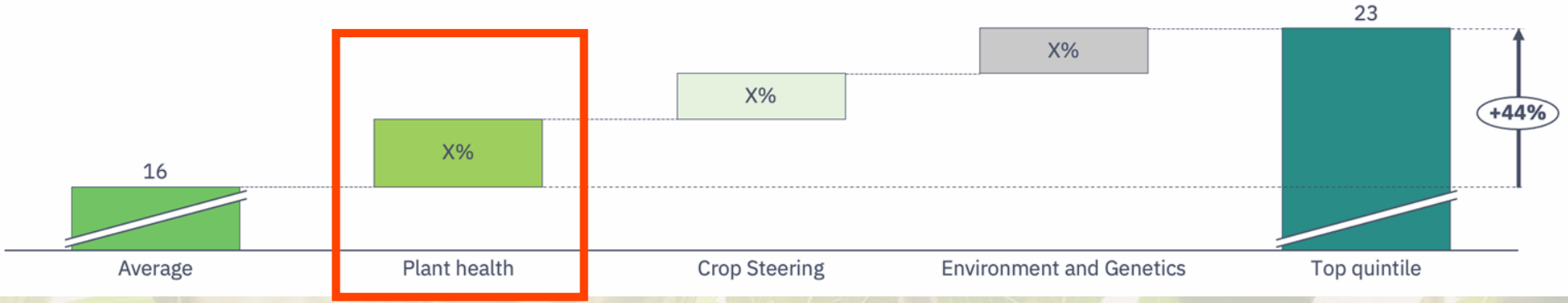


THE EMERALD CONFERENCE
Produced by MJBizScience

Lean Cultivation™

We start by quantifying opportunities – deep dive, analytics with Metrc, waste, genetics, inputs, labor data

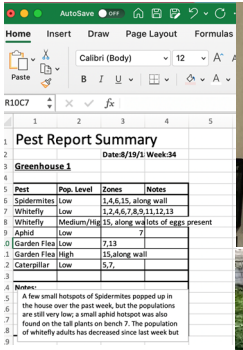
Levers of yield and quality improvement opportunities (avg. vs top quintile g / sq.ft.)

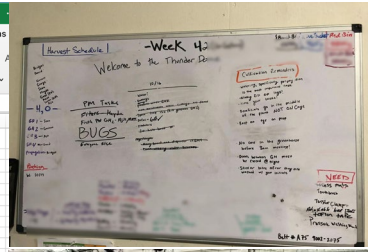


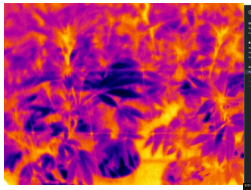
THE EMERALD CONFERENCE
Produced by MJBizScience

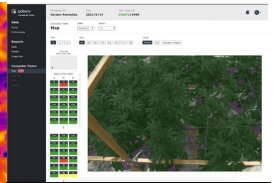
Lean Cultivation Case Study

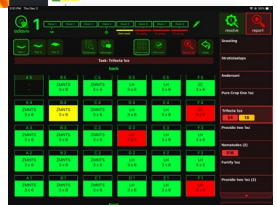
IPM Smart Workflow – Automate-enhance scouting, upskill team, improve SOPs, reduce reaction time & prevent losses



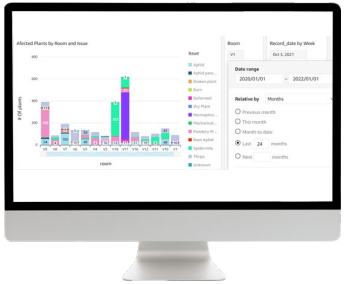








✓ automate
✓ quantitative
✓ visibility
✓ scale
✓ digital twin

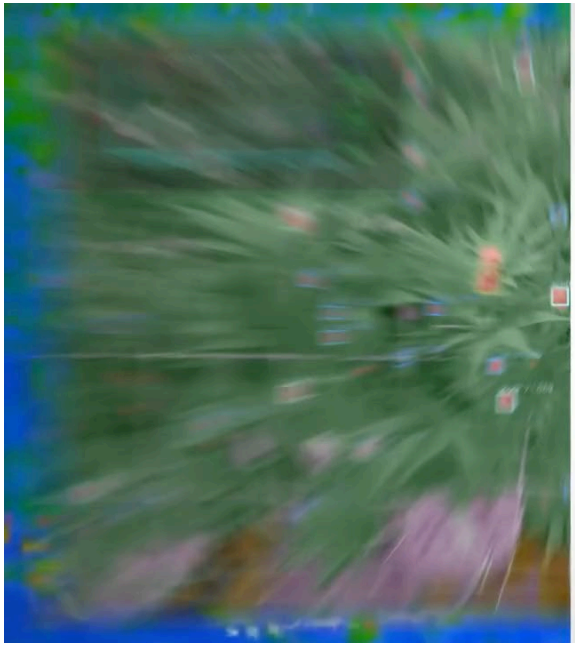


✓ identify waste
✓ rapid response, horizontal communication
✓ maximize time on value-add
✓ strain-level insights - continual improvement
✓ operational excellence – plant-quality

THE EMERALD CONFERENCE
Produced by MJBizScience

Lean Cultivation Case Study

IPM Smart Workflow – Botrytis Case Study:
How fast can we detect, react and minimize the impact?



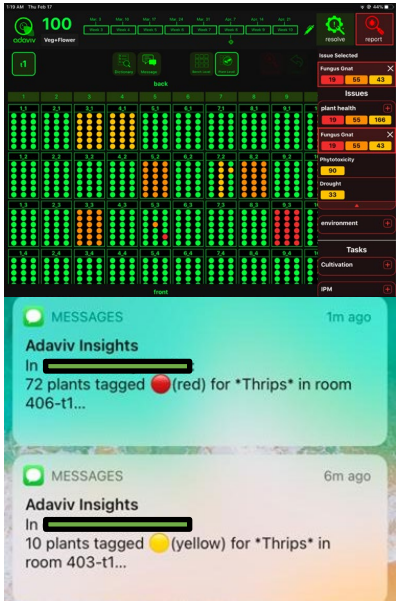
to enhance

patial

isibility and

tments,

and **Losses**



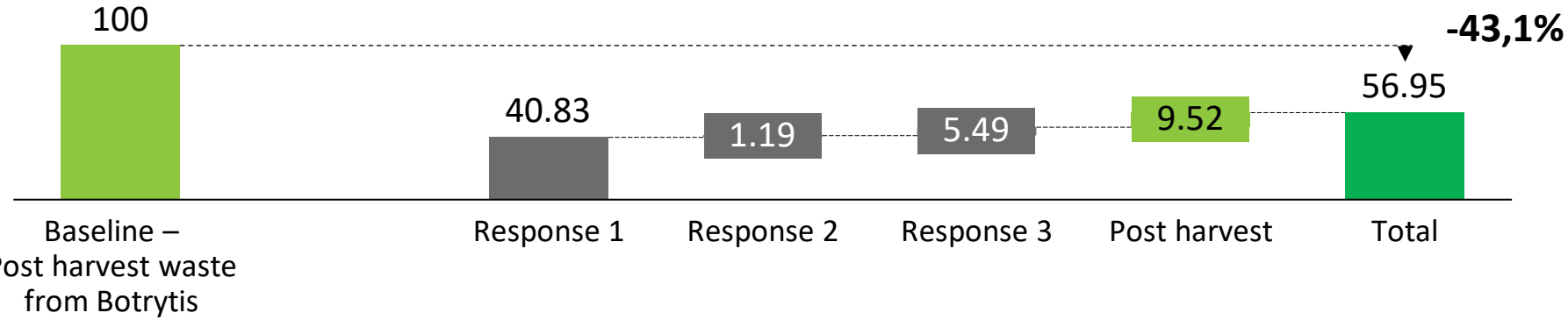
THE EMERALD CONFERENCE
Produced by MJBizScience

Lean Cultivation Case Study

IPM Smart Workflow – Botrytis Case Study: **1 Issue - $400K/yr gains**

Early results: **10x** reduction in post-harvest losses from Botrytis, **45%** reduction in losses

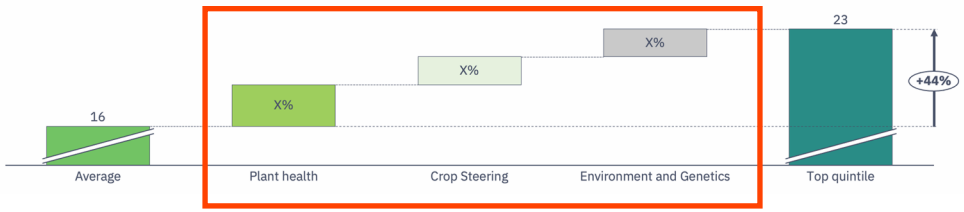
% of wet yield lost due to Botrytis, 2021



THE EMERALD CONFERENCE
Produced by MJBizScience

Lean Cultivation

Quality plant-level data and integration Uncovers key insights and trends



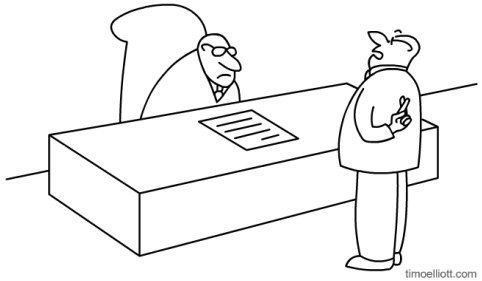
- **Hotspots/microclimates** – monitor, adapt (fans), facility upgrades
- **Susceptible Strains** (PM, HpLVd) – better planning, selection, phenohunting
- **Treatments** – targeted, timely, min. over-spray
- **Issues (PM) spread FAST** - React, communicate rapidly
- **Future**: Recipe generation, Plant transpiration, Phenotypic expression

THE EMERALD CONFERENCE
Produced by MJBizScience

Lean Cultivation & AI

AI is powerful but does not create value on its own or with flip of a switch!

- only 55% of institutions believe automation program has been successful.
- 50% say harder to implement than expected.



"Yes sir, you can absolutely trust those numbers"

"Garbage in, garbage out"

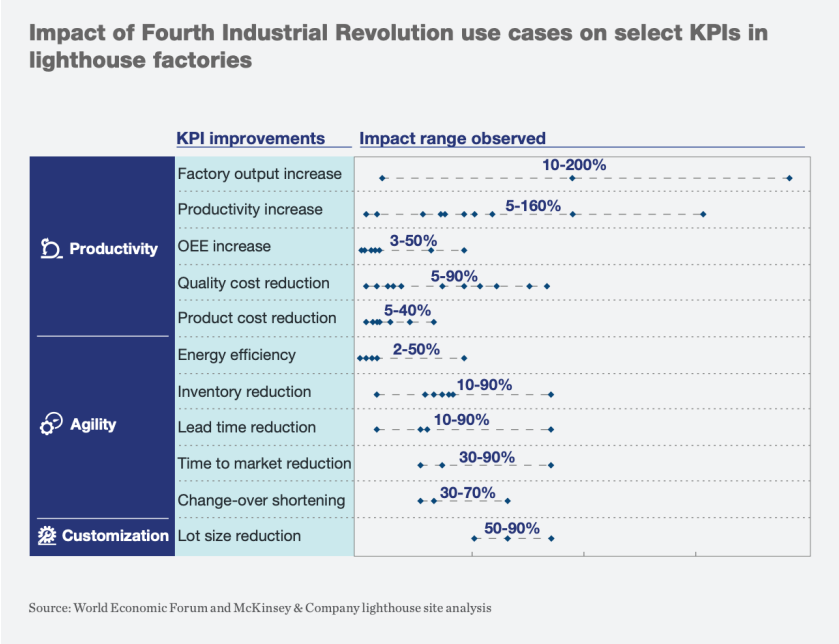
Your analysis is as good as your data.

THE EMERALD CONFERENCE
Produced by MJBizScience

Lean Cultivation & AI

Faster AI and Data-driven adaption creates large gains for front-runners

- **Distinctive insights** (uncover factors to predict performance)
- **Processing time reduced**
- **Increased** flexibility and **scalability**
- **Improved quality** towards 100% QC from greater traceability
- **Increased savings** and productivity (20%+ labor)



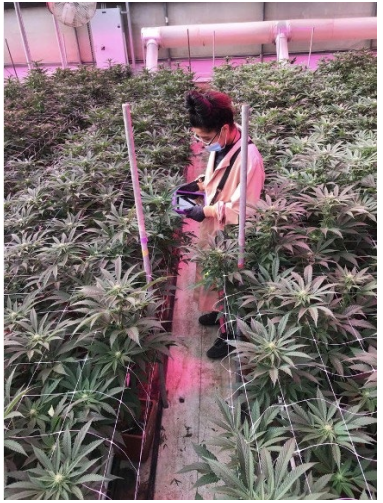
THE EMERALD CONFERENCE
Produced by MJBizScience

Lean Cultivation™ + Plant Empowerment

~~Man Vs. Machine~~ **Man + Machine**

Together we can formulate Profitable growing practices that use data-driven approaches to ensure plant balances are optimized.

1. Identify areas of waste.
2. Make a cultivation plan.
3. Implement it consistently.
4. Monitor with data.
5. Analyze, improve, scale.



Lean Cultivation :

Drive impact & profits at scale with plant-level data, AI and automation

Cultivators have to navigate fragmented market:

- **Understand the so-what of pitches** - how moves to actions and continuous gains?
- **Does what claims** - reliable, accurate, scalable, easy, one-time or repeatable, cannabis-specific?
- **What's real value of the data**, KPIs and metrics - if not tied to your operational improvement then why need it? Ready to adopt?

ian@adaviv.com
@adavivinc

Appendix / Backup

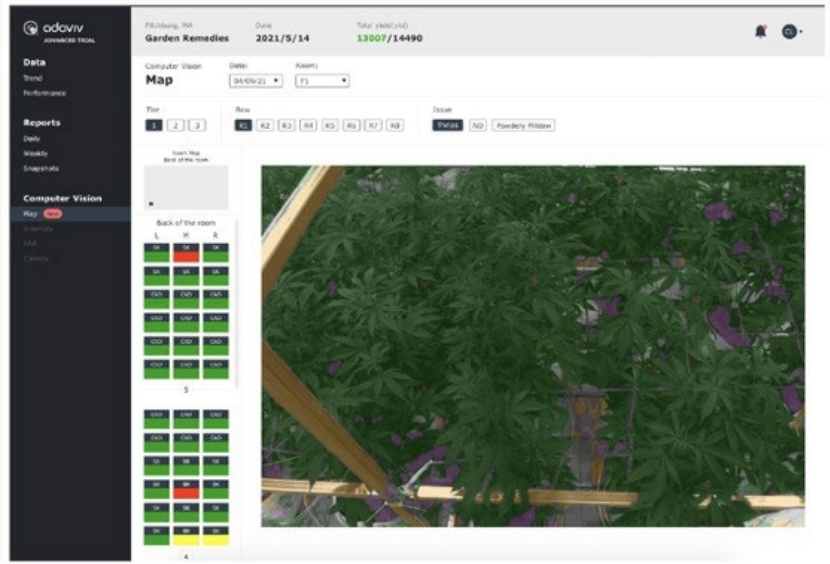
THE EMERALD CONFERENCE
Produced by MJBizScience

Lean Cultivation

IPM Smart Workflow – PM and HpLVd Case Study

Sensing Technologies, Plant-level Data and Continual Improvement on SOPs can transform an operation, boost yields while saving on costs

Issues detected and tracked:
Viral anomalies (hplvd)
Fusarium
Phytium
Botrytis
Leaf/flower Burns
Chlorosis
Tray leaks
Mechanical damage



Adaviv

Ian Seiferling

CEO & Co-founder
PhD Env. Science & Biology

Julian Ortiz

COO & Co-founder
MBA 19, M.A. Economics

Moe Vazifeh

CTO & Co-founder
PhD Physics

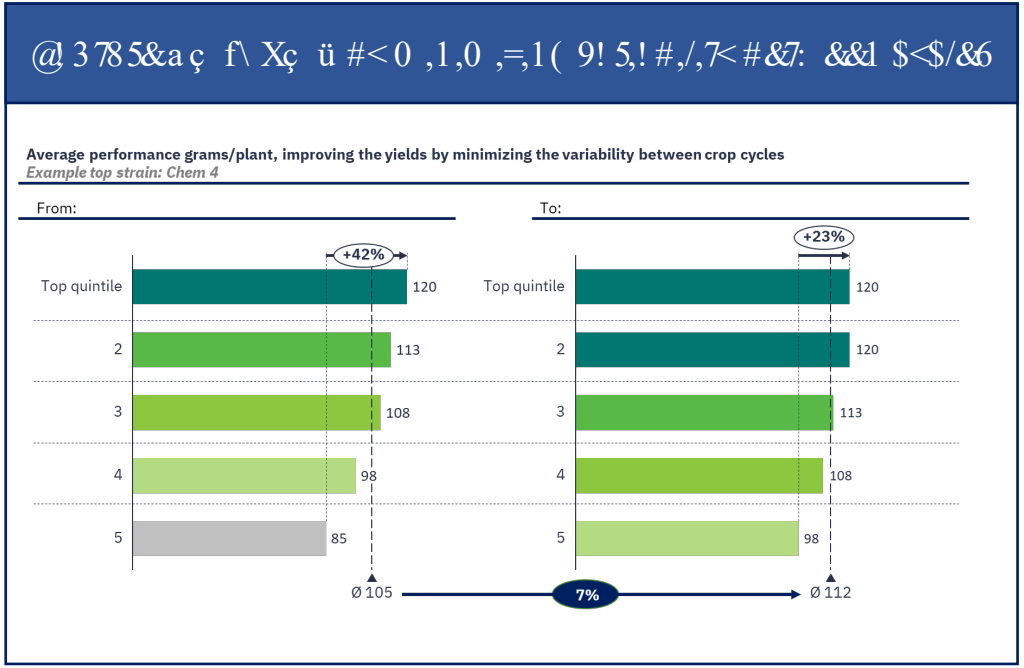
Alejandra Abril

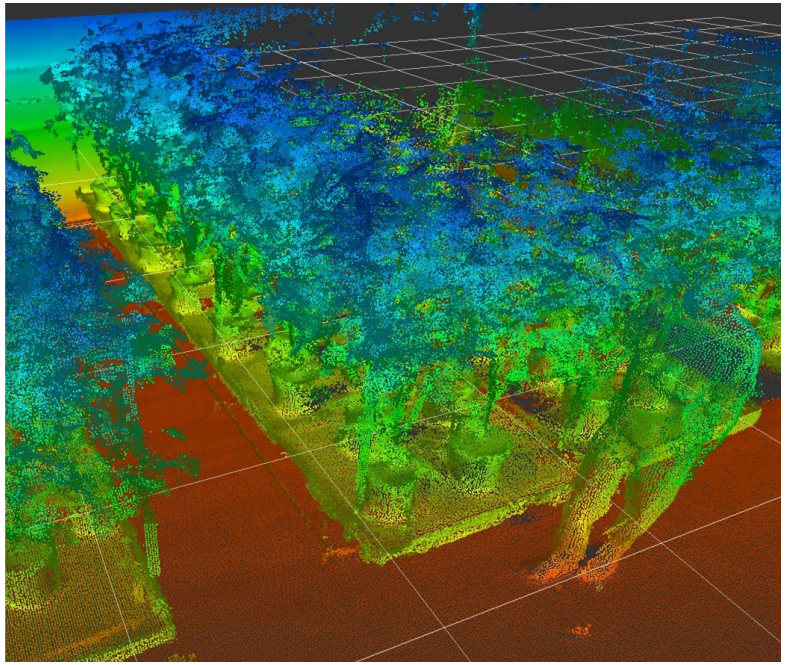
Plant Scientist
PhD Plant Mol. & Cellular Biology

THE EMERALD CONFERENCE
Produced by MJBizScience

Lean Cultivation™

We start by quantifying opportunities – deep dive analytics with Metrc, waste, genetics, inputs, labor data





We want to hear from you!

Scan the QR code below to provide your feedback on the presentation.