Continuous Improvement: beyond the buzzwords



CHECK DO DARE Kolotelo

Walter Shewart – father of statistical quality control



- Started with simple control charts
- Identify "special-cause" variation
- Current iterations like ISO 9000









- CI is often manufacturing focused and we need to place value on variability not try to remove it at all costs
- It's quite different with our long rotation trees
- Forest tree seeds (+shrubs, ground vegetation) are in a relatively wild state compared to agricultural crops = genetic diversity
- Trees are some of the most heterogeneous organisms on the planet
- 'Complicates' direct adoption of agricultural techniques and practices
- The variability and complication are often underappreciated from those coming from much more uniform food crop speciesand that's where seed science is taught

I liked these Continuous Improvement Principles

1. Stop fixing and start Improving





- 2. The best practices are the ones you already have
 - Context how do you reward innovation, borrowing/ buying = behind
- 3. Changing behaviour is more important than changing processes
 - It ain't always easy Change Management is a contact sport
- 4. If you aren't failing, you aren't trying (*learning*)
 - Small scale experimentation can pay off in big ways, but some experiments will fail – make sure you don't fail the same way again

The "Answer" vs. Continuous Improvement

• It goes back to the variability of our product

Data is not Information Information is not knowledge Knowledge is not wisdom

- Is it really representative of the species?
 - Use of seed for research
- Are the treatments really operationally feasible?
 - Scaling-up is sometimes not possible/worthwhile
- Have environments been adequately considered
- What do you do if all your interactions are significant
 - Decisions still need to be made





Gartner Hype Cycle



The Extinction of Extension????

- Science is going deeper with new technologies to unravel the mysteries
- The gaps between science and operations is widening (the Grand Canyon)
- When did technology transfer die?
- We need it more than ever!
- Knowledge Portfolio Diversity







- Sheep Can Become Eagles
- Eagles Can Become Cows

Reach for the Eagles

- Sheep and Cows play a role
- Avoid the dogs

Managing for the Eagles

- 1. Work will people who can make things happen
- 2. Encourage problem driven research vs. methods oriented
- 3. Encourage risk-taking

Generalizations

• Prolonged stratification will increase rate of germination and ability to germinate under sub-optimal conditions (=Vigour) for average seedlots



Stratification Moisture Content

- Can be critical to breaking embryo dormancy
- We fully imbibe seed (running water soak) and then <u>surface dry</u> it for ease of sowing & minimization of fungal problems





Target Moisture Content for Cold Stratification



QA Nursery Feedback (last 5 years)

- 924 sowing requests
- Quality Assurance prioritization



Germinant Classification

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- **Germination Environment**
- Pretreatment

Sample Size

- Different points in time further time for problems
 variable by nursery elevated seed; birdcage stage; seed coat shedding
- uniform *vs.* variable, media differences How optimal are your conditions?
- differs from lab? extended stratification (+), shortened stratification (-), re-soaking, sanitation, upgrading,
- 400 seeds vs. variable # blocks/ half-blocks