IQ Test – What do following have to do with Process Improvement?

- Tractor rollover – flat tire (no fluid); spraying on steep ground; no seat belt; roll bar taken off
- Skidder kills operator – 500’ slope; no seat belt
- Employee gets caught spraying ineligible chemical near creek
- Combine kills grandpa (SK 2010) – grandson kid hits button in cab; 2nd wife sells farm defying sons farm plans
- Ranch hand – takes 2-3 times “normal” to feed, dig post hole, build braces; on cell phone constantly; terminated
- Fuel spill – employee fueling implement with auto-shutoff nozzle leaves scene; nozzle fails; big MESS!
- Employee talking on cell phone while winging out self-propelled sprayer – hits power lines & fries tires!
Answer...When you have:

No clearly defined company culture for
- Following SOPs
- Auditing Process Improvement objectives
- Rewarding/Incentivizing improvements

→ Bad things happen!

Case Studies –
#1 – Grain Hauling Efficiency

- **Problem:** 7 semis; under-loading trucks 40 bu./trip
- **Analysis**
  - Opportunity cost = $0.15/bu. x 40 bu/trip = $6.00/trip
  - 6 loads/day x 45 days @ $6.00/trip x 7 trucks = $11,340/yr
  - 5% cost reduction => 5% reduction in trucking needs
  - **Motivator:** Port of Entry fines → $100-500/overload
- **Solution/Options:**
  - Grain wagon electronic scale - $3,250 + $1,500 install
    → Payback in ½ season of harvest!!!
  - Electronic scales – each truck (ok for commercial hauler)
How did we solve problem?

- Defined problem
- Engaged team of affected stakeholders
- Mapped activity
- Analyzed cost of inefficiency
- Identified alternative solutions
- Implemented optimal solution
- Evaluated results of new process

Agenda

- What is “process management”
- Where does it fit in management process
- Motivation and rewards for excellence
- Consequences when you are lax
- Models, Applications and Case Studies for putting concepts into practice
100 Yr History of Process Improvement
Farmers doing it for years...never had a Harvard MBA term for it!

- Scientific Engineering – Frederick Taylor (1911) – summarizes 30 years of study in steel industry
- 1st exposure to term – *Cheaper by the Dozens*
  - Movie about time and motion studies - Frank Gilbreth
- Total Quality Management (1980's) → Six Sigma → Business Process Re-engineering → Business Process Re-design... and dozens of other buzzwords
- Bottom Line: deciding what to measure & manage

Pig Iron Case Study

Applied principles to steel millworkers handling pig iron.
Assessed motions, capacity of workers, developed process and picked 1st class handlers
Baseline – workers loading 12 ½ T /day
Results–
- handled 47 T/day – productivity ↑ to 400% of baseline
- Worker pay increased 60% ($1.15 → $1.85/day)
- Cost of production dropped 56% ($0.072 → $0.033/T)
Frank Gilbreth – father of “Time & Motion Studies”

- Studied motions of bricklayers reducing movements/brick from 18 to 5; positioned materials, support systems and workers for maximum efficiency

**Results**
- 350 bricks/hr vs. 120 industry average
- Bricklayers selected based on performance; substantial pay increases

*Gilbreth’s techniques still used today throughout trade industries to increase efficiency.*

Trivia? “Calculate savings (time/$) laying 800,000 bricks at college health science bldg (360 man-days)”

**Savings – Money & Time**

- 800,000 bricks @ 120/hr → 6,667 hrs
  - 6,667 hrs @$15/hr = $100,000
  - 4 person crew 6-10s → 6.5 months
- 800,000 bricks @ 350/hr → 2,286 hrs
  - 2,286 hrs @$20/hr = $45,700
  - 4 person crew 5-8s → 71 days/3.3 months

**Savings**
- $54,300 ↓ (54.3% lower cost)
- 49% less time to complete project
Lessons from Gilbreth/Taylor

- Four principles work
- One man alone can’t improve when working with team (“soldiering”)
- Takes management working with employees where **both** gain
  - Owner Benefit: lower cost production
  - Employees: increased pay; better work conditions (shorter days, more time off)

Modern Applications of Process Improvement Successes

Health care/pharmacy, fast foods, seeding systems, dairy, timber harvesting, crop production
Happy Days Corp
Meet my friend Bruce Finch
Fast Food Vendor par excellence!

- Multiple Taco Time outlets
- Observed time from order window to departure ...not happy!
- Challenged staff to identify solutions...gave $ incentives
- Sets new records annually for volume, speed, quality
- Exemplifies lifetime commitment to Process Improvement
- Project: engaged ATK T/M team to do study for Cinco de Mayo

Imagine clock like this in your shop!
Strategy/Results

Take homes

- Digital timers track time from order window to leaving hand out window
- Clipboards track average times & best times for week...employees continually work to BEAT times
- Incentives given for efficiency hours, record times
- Doubled taco output over 2 years
- 13% drop labor cost per taco

“One of the most important things about increasing efficiency is for the workers and management to know that in fact it can be improved. Keeping records of your past and present performance is very important.”  

Bruce Finch, Owner

Health Care – Robotic Pharmacy

Applications

- Used in 1/3 hospital pharmacies
- Dispenses medications in cassettes or envelopes

Benefits

- Filling accuracy 99.9%
- Checking labor ↓ 90%
- Missing meds ↓ 92%
- Inventory ↓ 10-20%
- Medication costs ↓ 54%
Halversons
2012 Top Producer of the Year Award

- 11 state potato operation; major supplier - FritoLay
- Gregg, Eric, John, Leah – two generations TEPAP
- Transitioning to next generation
- Major commitment to GAPs, SOPs, economic, social and environmental metrics (Triple Bottom Line)
- Use McDonald SOPs as model to improve brand
  → story: 8400T cost/hr

Shephards Grain – Food Alliance

- Value added premiums for wheat sourced under Direct Seed cropping system
- Must be Food Alliance certified
  - Certification Costs
  - S. T. Periodic Audits
- $.60/bu premium
  → 1,200 ac wheat @80 bu/ac = $72,000 bonus!
Milking Robots
Landry Brothers Dairy, St Albert, Quebec
Source: J D Furrow

Three shifts of workers replaced with 10 robots @ $200,000
- lower mastitis
- less management stress
- more attractive to young workers
- 10% increase in milk production
- better insemination results

“...robots don’t take holidays or call in sick, never get tired, lose focus or have a bad day...and they NEVER FORGET important things about each cow...like how many times a day a cow needs to be massaged!”

33 years of Process Improvement – Wittman Farms

Baseline - 1980
- 6 partners, 2,500 ac farm, 2,500 pasture, BIG crew
- 4 combines; 6 trucks
- Farming implements covered ground 6-8 times/year

Today
- 4 partners, 19,000ac
- 100% Direct Seed
- Efficiency compared to 1980
  - 1 combine replaces 6
  - 1 semi-tk/trlr replaces 4
  - Sprayer = 8x ac. per day
Where can Process Improvement be applied?

... and how do we put principles into practice?

Definition – *Process Improvement*

Systematic approach to closing of process or system performance gaps through streamlining and cycle time reduction, and identification and elimination of causes of below specifications quality, process variation, and non-value-adding activities.

*source: google.com*

...*doesn’t this sound exciting!!!*
Farmer Definition
Process Improvement is...

- Identifying jobs that are repetitive
- Documenting how job is supposed to be performed (SOP, GAP, BMP)
- Evaluating how to do it better:
  - More Efficient
  - Safer
  - More Economical, and
  - Environmentally sustainable
- Auditing how you’re doing & rewarding gains

Farm Applications of SOPs/GAPs

- Office functions
- Harvest/Equipment operations & servicing
- Crop agronomic practices
- Fuel and Farm Supply Storage (chemical/fert)
- Worker safety guidelines
- Food safety practices
- Herd health & stock handling procedures
- Value added market access
Office Management Functions

- Database management
- Computer access protocols
- Internal controls/security
- Data Backups
- Network and internet system
- Financial function SOPs

Where would your business be tomorrow if:

- You were hit by bus,
- Computer technology expert left country,
- Bookkeeper ran off with hired man,
- Computer fried itself & the backup system,
- NO one else knows your system!

→ How I learned the hard way...
Building Office SOPs

- Define issues needing documentation
- Write down in SOP
- File in accessible location
- Use for training/orientation
- Update when new items needed, or existing items need refinement

Equipment Operations & Servicing

- Maintenance checklists
- Operating instructions – key equipment
- Shop protocols
- Seasonal work flow planning
- Harvest crew orientation
- On farm grain storage protocols
Chassis Checklist

Imagine fleet of trucks...
How avoid “…the dreaded phone call”
“Are you SURE you checked everything?”

Service Truck – Stocking Checklist

“Why are there two empty hydraulic oil jugs in here ...and NO anti-freeze???”
Fuel & Supply (chem/fert) Storage

- Handling procedures
- Security
- Spill prevention
- Identification/open container policies
- Fueling protocols

---

Spill Prevention Containment & Countermeasure Plan

- Facility owner, operators & key contacts
- Facility Description
  - Operations
  - Storage – detailed maps of tanks, location, and storage capacity
  - Drainage Pathway & Distance to navigable water
- Spill History
- Potential spill predictions, volumes, rates and controls
- Prevention measures provided
- Record keeping/meetings, inspections

$15,000 price tag... but required to source fuel!
Deming’s Law

A system always gives you 100% of what the system was designed to do...94% of failures come from systems, not PEOPLE.

Example – Deming’s Law

- Pick number between 1 & 9
- Multiply answer times 9
- Add the 2 digits in your answer & subtract 5
- Pick letter in alphabet that matches order (i.e. 5 = E)
- Identify single word country name whose 1st letter = last answer
- Name wild exotic animal that starts with last letter of country name
Safety Procedures

- Exposures – too many to list
  - PTO, conveyors, hoists
  - “riders” – tks, combines, tractor
  - Equipment rollovers – dozers, skidders, tractors
  - Transport – cargo strapping
  - Runaways (vehicles, implements)
- Story: Partner’s wife & kids driving potato truck

What is your “safety policy”?

Think Proactively
...what’s this →

Lee Gilbert, ID St Insurance Division

- Conducts safety audits, on-site training
  - 4-5 hour Safety Training Sessions
  - Supervisor Workshops on Accident Investigations
  - Shop Audits – inspects for potential hazards
- "...1st line supervisor needs to communicate on near misses/close calls."

- For every $ in insurance claim, employer spends $4-5
- Incentives for thinking proactively
  - safe work place
  - Insurance premium modifications
Some interesting stats...

- 1 Disability/death
- 10 Minor injuries
- 30 Property damages
- 600 Near misses/close calls

“Predictable Surprises…” — Mike Mullane, NASA Astronaut, author of Riding Rockets

- Success = doing things well over & over consistently
- Recipe for success = managing “processes”
  - Be aware of “normalization of deviance” — human tendency to deviate from standards
  - Take responsibility for adherence to standards;
  - Be courageous leader in alerting to deviations
  - Beware of “false feedback” — absence of something bad happening ... (didn't cause wreck last time!)
  - Listen to people closest to the scene or front line
  - Archive, review and learn from “near misses” and disasters
Cell phone use

What is your company policy?

Are you asking for “predictable surprises”?

Implementation Strategies for Safety Process Improvement (SOPs)

- Identify hazards unique to farm situation (get examples from peers & fine tune)
- Document SOPs – Include rewards for “quality improvements” and punishments for “violations”
- Defined protocol for employee training, orientation (incl. meeting dates, agenda, participation logs)
- Appoint safety officer
- “Safety audits” (i.e. State Workmen’s Comp)
- Define Zero Tolerance Policy – worksite rules
Job Site Safety SOPs – Think like Seattle, WA contractor...(UPS, GLC Contractors)

- Pocket size “little red book” with rules
- No access to jobsite until go thru training & sign-off
- Once on site, hard hat with “sticker” required
- Zero tolerance for violations of rules
- Lesson to farmers: is your farm a playground or work site?
- Challenge: how maintain our “culture” & be safe?

Agronomic Areas of Application

- Nutrient management
- Integrated pest management (IPM)
- Access to conservation revenue incentive programs (CSP, EQIP)
- Input documentation – seed, fertilizer, chemical, field operations
- Precision Farming – Variable Rate Application SOPs
VRA Case Study

**Problem:** Excessive reliance on technical support 8 hours away

**Analysis/Problem:**
- Studied process from combine maps to creation of VRA .arm files for drill operator
- Timeliness & quality of yield maps unacceptable
- Poor consistency-soil fertility analysis and yield projections

**Solution** → *in-source process with external consulting support*
- Mapped stages of process; paid consultant to train on process
- Developed 3 page SOP...VRA prescriptions now done in house
- Save thousands $ annually...better process!

Food Safety, GAPs, BMPs

**Dual drivers pushing growers for implementation**
- Defensive (food safety, water quality, etc.)
- Offensive (market access, premiums)

**Process for putting GAPs in place**
- Resources available to minimize cost and avoid “re-inventing” wheel
Major Driver – *Food Safety Modernization Act 2010 (FSMA)*

**Key provisions:**
- FDA authority for recall
- Shift from detention to prevention
- Standards for production & harvest
- Focus on traceability
- Compensation for growers injured by erroneous recall
- Registered facilities require HACCP plan

**Other Provisions**
- Potatoes *now covered* (“thrown under the bus” by other veggie groups)
- Small operations ($<500,000) & grains exempt

**Recommendation:** Study Act and learn how provisions impact your commodity

---

**Food Quality “Hits”**

- Alar Scare-apples
- E coli-leafy greens, ground beef
- Salmonella - peanuts
- Listeria – CO cantaloupe
- BSE - beef
Questions to Address

What processes require documentation?
- Depends on your commodity...check the law and regulations

How do I map out SOPs?
- Learn from peers who’ve DONE IT already

Where can I get help...and NOT reinvent the wheel?  *(Hint: go to Google.com)*
- STORY: Premium Fresh client engagement

GAP Elements –
Bliss, NY Dairy & Potato Farm

**Plan 12 pages long**
- Traceability procedures
- Worker health/hygiene training
- Clothing & jewelry policy
- Hand-washing techniques
- Policy on taking breaks
- Manure
- Composting Practices

- Harvesting tools, containers
- Vehicles in production fields
- Plant & Storage warehouse
- Loading delivery trucks
- Washing line
- Storage bins
- Rodent & Pest Control

*Tom McCormick “All visitors must sign in & wash hands...all SOPs must be recorded & available to inspectors & buyers.”*
Herd Health/Stock Handling

- Areas of application
  - Stock handling
  - Animal identification/traceback
  - Herd Health (BQA – Beef Quality Assurance)
  - Confined Animal Feeding Operations (CAFO)
  - Waste Management

- Resources

Herd Health SOPs

- What happens when don’t exist?
  - Inconsistent procedures
  - Duplicative or unnecessary costs
  - Health problems, losses
  - Jeopardize access to premium markets

- Sample – ..\FARM\Management System Components\BeefHerd Health SOP.doc
### Processing Map

**Cattle Treatments**

- Keeps crew organized at chute
- Permanent record of treatment
- Verification for feedlot to avoid duplicate input
- Verification to market outlet

### Table: Beef Herd Health Protocol

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
<th>Purpose/Detail</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>Cattle identification</td>
<td>All ear tags should match shoulder brands</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tags – Pre-Catering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April</td>
<td>Pre-Breeding Visual</td>
<td>Cattle identification</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Late January</td>
<td>Breeding Soundness</td>
<td>Check eyes, teeth, feet and legs, semen test</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Examination</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leptospirosis</td>
<td>Prevent abortions</td>
<td>StayBred VLS</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>Redwater/Blackleg</td>
<td>Prevents spore-forming bacteria</td>
<td>Vision +Bonus</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pin eye</td>
<td>Prevent eye redness &amp; inflammation</td>
<td>Pilguard</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vibrosis and/or</td>
<td>Prevent infertility &amp; abortions</td>
<td>Vibin</td>
</tr>
<tr>
<td></td>
<td>Salmonella</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prevent shipping fever</td>
<td>CattleMaster Gold</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>External parasite control</td>
<td>Ice and grub control in fall, fly control in summer</td>
<td>Cydectin (summer) Dectomax (fall)</td>
</tr>
<tr>
<td>January –</td>
<td>Calving</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April</td>
<td>(calves @ birth)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Identify</td>
<td>Ear tag should match mother’s</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disinfect navels</td>
<td>Prevent nasal disease</td>
<td>H2O &amp; Betadine solution</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Castrate (bull) calves</td>
<td></td>
<td>Bands</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vitamin A &amp; D injection</td>
<td></td>
<td>Vecho A&amp;D</td>
</tr>
</tbody>
</table>

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*Copyright 1999 Wittman Consulting Services*
CAFO Elements – Bliss, NY Dairy & Potato Farm

**Plan is 6” thick!**

- Farmstead plan-map, water quality plan
- Field plan-solid mgmt, maps, attributes, soil mgmt plans
- Fertility mgmt-nutrients, leaching index, soil tests
- Manure/Waste utilization – annual prodn, analysis, application planning

- Must have “certified planner”
- Plan required before you can apply manure to “CAFO compliant field”
- Annual review mandatory to renew annual permits
- Plans sets minimum standards on barnyard run-off, lagoons, silage leach

"We are mandated to have GAP, SPCC, CAFO in place...CAFO most complicated regulation on farm."

Stock Handling

- Quiz: Name recent videos that gave meat industry a black eye?
  - Answers: __________
- What is your “animal treatment” culture?
- Do you have an animal care policy & SOPs?
- Food Safety protocols “up to snuff”?
Animal Care – vs. “Agendas”

- Who won this one?
- Aired 20-20
- U-tube hits galore
- Are “good guys” safe?

Example: Animal Care Statement
Source: May 2006, Dairy Today, Meg Gaige – Aurora Ridge Dairy

At Aurora Ridge Dairy we strive to provide each animal with the very best individual care possible. All of our actions will be based on this goal. Because of this:
- We will handle all animals in a calm and relaxed manner.
- We will do everything possible to prevent injury, illness and undue stress.
- We will give sick animals immediate and thorough care.
- We will provide all injured or down animals with adequate food, water, bedding and veterinary care.
- We will use all animal-handling equipment like the crowd gate and prod in a reserved and respectful manner.
- We will give appropriate assistance to a freshening cow, treating her as a mother giving birth should be treated.
- We will give newborn calves complete care as soon after birth as possible, following protocols established for their care.
- We will practice clean and calm milking procedures established by the dairy management team.
- We will build facilities with animal comfort and care as the first priority.
- We will employ people who are responsible and who enjoy working with animals.

—Meg Gaige

“Never use a gun to herd cattle!” Temple Grandin
Variance Analysis – Key Component of Process Improvement

- Do you see a problem?
- What is company policy re: following SOPs?
- What are variance concerns if:
  - Cattle foreman?
  - Taco restaurant?
  - Sprayer operator?
  - French fry plant?

Variance Case Study - Sprayer

- **Situation:** Goal is to spray @ specific target/acre
- **Problem** – chemical being over-applied based on acreage
- **Consequences:** 10% cost over-run; crop damage; envir. issues
- **Analysis/Potential Causes of Problem**
  - Overlap
  - Nozzle wear
  - Flow meter calibration

**Quiz:**
(1) What is biggest factor leading to Precision Ag?
(2) What Preventive Maintenance strategies could be implemented to avoid this problem?
Human Resource SOPs

- Job announcement, application, interview
  ...
- Job descriptions, training & orientation
- Safety Guidelines
- Performance Reviews
- Compensation Policy and Payroll Procedures
- Employee benefits, vacation, sick leave

→ Do you have: Personnel Policy/Employee Handbook/Management System Operations Manual

What is your governance culture?

"All organizations are hierarchical. At each level people serve under those above them. An organization is therefore a structured institution. If it is not, it is a MOB. Mobs do not get things done, they destroy things."

Theodore Leavitt – Management for Business Growth
Are Policies Written Down?

...Common “Land Mines”

- Housing
- Company vehicles
- Room and board
- Expense accounts
- Setting compensation
- Withdrawals of capital
- Insider/inter-entity transactions

- Family Employment Policy
- Medical benefits
- Retirement plans/pensions
- Business benefit continuation
- Workdays and holidays
- Vacations, sick, business leave
- Buyout Understandings
- Outside activities

What does your organizational structure look like?
Responsibilities – Finance (CFO) and Marketing

- Budget preparation and progress review
- Maintain records and circulate to management team
- Arrange loans for operating and capital purposes
- Banking responsibilities
- Capital investment analysis; negotiate purchases
- Market grain commodities
- Preparation of tax returns
- Manage insurance programs
- Liaison with attorney on legal matters
- Supervise investments for pension plan
What incentives are you using?
"...avoiding concrete"

- Rewards for clean inspections
- Share in premiums gained over market
- Gift/bonus for attending safety meeting
- Other incentives?
  - 
  - 
  -

Where to Start - Implementation Strategy

- Form in-house team with outside facilitator
- Review legislation, regulatory requirements; attend training conferences – food safety
- Research peers who have implemented GAPs, SOPs, BMPs...define scope you need to codify
- Research audit/certifying organizations
- Consider engaging auditor/certifier to do “test drive”
- Develop strategy for getting documentation in place
  - Do your own, outsource
- House SOPs where staff can FIND them!
Time to wrap up...

Have you taken inventory of your Process Improvement elements?

Challenge – bringing it all together

- Array of manuals
  - Office Manual
  - Employee Handbook
  - Management System
  - Shop Manual
  - CAFO, GAP
  - CSP

- Need manual to describe your manuals!!
Conclusions—“Good is the enemy of great”

- LEAST favorite management task
- TEAM must take ownership and commit to process...but assign “lead role” to accountable party
- Inventory where this “piece” fits into your management process
  - More complex your business...more STUFF to do
- Prioritize issues & do 5 D's (discuss, decide, document, disseminate, “do it”)...then check it!
- Offer rewards & incentives to motivate positive change → payoffs can be HUGE!