

# Quality Management & Control

Chapter 6

Farm Management: Principles and Strategies, Kent Olson, 2003

## Chapter Outline

- Quality Defined
- The Costs of Quality
- Quality Management
- Process Control
- Tools for Process Improvement

Farm Management: Principles and Strategies, Kent Olson, 2003

## Quality management

Involves a holistic view of the whole farm and builds a commitment to quality throughout the farm

Farm Management: Principles and Strategies, Kent Olson, 2003

## Quality control

Assures that the already selected processes and products are done according to plan.

Farm Management: Principles and Strategies, Kent Olson, 2003

## Quality Defined

Farm Management: Principles and Strategies, Kent Olson, 2003

## What is quality?

“meeting or exceeding customer requirements”

Farm Management: Principles and Strategies, Kent Olson, 2003

## Who defines quality?

- **The customer defines quality!!**
- **NOT** the producer
  - (Nor the professor)

Farm Management: Principles and Strategies, Kent Olson, 2003

## Determinants of Quality

- Quality of Design
- Quality of Conformance
- The “Abilities”
- Service after Delivery

Farm Management: Principles and Strategies, Kent Olson, 2003

## Quality of Design

- Determined before the product is produced
- Quality of market research
- Quality of concept
- Quality of specification
- Translates the needs of customers into specifications

Farm Management: Principles and Strategies, Kent Olson, 2003

## Quality of Conformance

*Quality of technology, employees,  
& management*

*Producing a product  
that meets specifications*

*(Remember this idea for ISO 9000)*

Farm Management: Principles and Strategies, Kent Olson, 2003

## The “Abilities”

- **Availability**  
*(Continuity of service to customers)*
- **Reliability**  
*(Length of time before a product fails)*
- **Maintainability**  
*(Restoration of the product after failure)*

Farm Management: Principles and Strategies, Kent Olson, 2003

## Service after Delivery

- **Warranty, repair & replacement**
- **Quality of service determined by**
  - Promptness
  - Competence
  - Integrity

Farm Management: Principles and Strategies, Kent Olson, 2003

## What is:

- Product quality?
- Process quality?

Farm Management: Principles and Strategies, Kent Olson, 2003

## The Costs of Quality

Control costs  
Failure costs

Farm Management: Principles and Strategies, Kent Olson, 2003

## CONTROL COSTS

- Prevention Costs
  - Planning, review, training, data, improvement projects
- Appraisal Costs
  - Inspection, quality labs

Farm Management: Principles and Strategies, Kent Olson, 2003

## FAILURE COSTS

- Internal Failure Costs
  - Scrap, rework, downgrading, retest, downtime
- External Failure Costs
  - Warranty, returns, complaints, allowances

Farm Management: Principles and Strategies, Kent Olson, 2003

## Quality Management

Farm Management: Principles and Strategies, Kent Olson, 2003

## The Quality Gurus

- W. Edwards Deming
- Joseph Juran
- Armand Feigenbaum
- Phillip Crosby
- Kaoru Ishikawa

Farm Management: Principles and Strategies, Kent Olson, 2003

## 12 points from the quality gurus

1. Quality is defined by the customer
2. Quality improvement must start with management's commitment
3. Problems in the system, not the workers, cause inefficiency and poor quality
4. Continual improvement is needed

Farm Management: Principles and Strategies, Kent Olson, 2003

## 12 points, cont.

5. Prevent defects, don't just throw them out
6. Quality planning, quality control, and quality improvement must go together
7. Improving human factors is more important than improving technological factors
8. Do it right the first time

Farm Management: Principles and Strategies, Kent Olson, 2003

## 12 points, cont.

9. Quality is free
10. Cause and effect diagrams
11. Quality circles
12. Internal customers

Farm Management: Principles and Strategies, Kent Olson, 2003

## Total Quality Management

TQM is a management philosophy that strives to involve *everyone* in a *continual* effort to improve quality and achieve customer satisfaction.

Farm Management: Principles and Strategies, Kent Olson, 2003

## TQM steps

1. Find out what the customer wants
2. Design to meet or exceed what customers want
3. Design processes for doing the job right the first time
4. Keep track of results & improve the system
5. Strive to have suppliers and processors adopt TQM

Farm Management: Principles and Strategies, Kent Olson, 2003

## TQM ideas & concepts

- Continuous improvement
- Competitive benchmarking
- Employee empowerment
- Team approach
- Data-based decisions
- Knowledge of quality management tools
- Supplier quality
- Quality at the source

Farm Management: Principles and Strategies, Kent Olson, 2003

## ISO 9000 Standards

- ISO (International Organization for Standards)
- Orientation toward compliance
- Design quality not included
- Does this relate to farmers?
  - Article on Iowa grain farmers & ISO 9002 (Swoboda 2001)
  - Factsheets on MinnCERT & MNCEP (Stamer 2001)

Farm Management: Principles and Strategies, Kent Olson, 2003

## Hazard Analysis and Critical Control Point

- HACCP, pronounced "hassip"
- To design systems to monitor and reduce contamination through preventive and corrective measures at each stage of the food process where hazards could occur

Farm Management: Principles and Strategies, Kent Olson, 2003

## 7 principles of HACCP

- Analyze hazards
- Identify critical control points
- Establish preventive measures & limits
- Establish procedures for monitoring
- Establish corrective actions
- Establish record-keeping procedures
- Establish verification procedures

Farm Management: Principles and Strategies, Kent Olson, 2003

## Process Control

Farm Management: Principles and Strategies, Kent Olson, 2003

## Process Control

- Standards
- Measurement
- Corrective actions, if needed

Farm Management: Principles and Strategies, Kent Olson, 2003

## Types of Control

- Preliminary controls
  - Variety Choice
  - Sanitation Program
  - Schedule of Operations
- Concurrent controls
  - Health monitoring, SCC counts, ...
  - Scouting, Plant Tissue Testing
- Feedback controls
  - Variety choice
  - Maps indicating weedy patches
  - Culling and replacement decisions

Farm Management: Principles and Strategies, Kent Olson, 2003

### Developing a process control system:

1. Identify critical points
2. Choose the type of measurement
3. Identify measurement methods and frequency
4. Specify standards and "in-control" range
5. Establish rules of action to bring the system back into control

Farm Management: Principles and Strategies, Kent Olson, 2003

### Components of a Soybean Production Control System (from Table 6.1)

Critical point	Seed placement: distance & depth
Type of measurement	Variable
Sensor	Tape measure
Monitoring schedule	Test before planting & then once a day
Control standards	¼-1¼" between seeds & 1½-2" deep
Corrective actions	Adjust planter

Farm Management: Principles and Strategies, Kent Olson, 2003

### Components of a Beef-Finishing Control System (from Table 6.2)

Critical point	Animal health
Type of measurement	Attribute
Sensor	Visual, auditory
Monitoring schedule	Daily
Control standards	No coughing, no slowness, no down animals, no sores, etc.
Corrective actions	Inspect closer, call the vet

Farm Management: Principles and Strategies, Kent Olson, 2003

### Fail-safe plans

- Eliminating the possibility of problems or mistakes happening
- Task lists
- Red flags
- Tool boxes
- Kits

Farm Management: Principles and Strategies, Kent Olson, 2003

### Components of a Fail-Safe Plan for Receiving Yearlings (from Table 6.3)

Item to be monitored	Initial health
Method	Visual, auditory
Schedule	On arrival & at 8 hour intervals
Control standard	Walking properly, active, no coughing
Corrective actions	Call vet
	Done by (initials, day, time)
At arrival:	
8 hours:	

Farm Management: Principles and Strategies, Kent Olson, 2003

### Check sheets

- To record the frequency of events related to quality and process
  - Deaths
  - Harvest problems
  - Disease
- No quantitative measurement,
  - just a recording of occurrences
- Is there something that needs to be checked further?

Farm Management: Principles and Strategies, Kent Olson, 2003

Table 6.4. Check sheet for baby pig deaths.

Cause of death	Week of April 3-9	Total deaths
Stillborn	√√√√√ √√	7
Diarrhea	√√√√√ √√√√√ √√√√√ √√√√√	19
Laid on	√√√	3
Unknown	√√√√√	5
	Total	34
Comments: <b>Need to use more complete cleaning methods after this farrowing</b>		Initials: RW

Farm Management: Principles and Strategies, Kent Olson, 2003

## Trend or run charts

- A running plot of measured quality characteristics
- Grain temperatures
- Market prices
- Is there a bad trend?

Farm Management: Principles and Strategies, Kent Olson, 2003

Figure 6.2. Trend chart of the temperature of shelled corn in two bins (A and B).



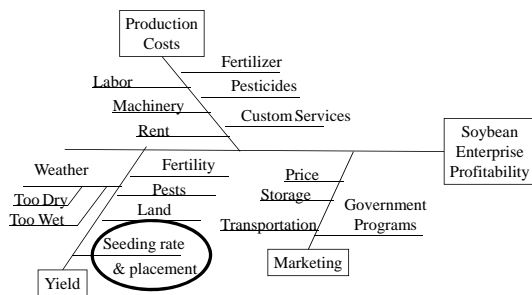
Farm Management: Principles and Strategies, Kent Olson, 2003

## Cause & Effect (CE) Diagrams

- To find the cause of problems
- To find sources for improving what is already good or "pretty good"
- On the right: write the goal or problem
- On the left: group and write all the factors that affect the goal or problem
  - Initial factor groups: workers, material, tools/equipment, inspection, weather

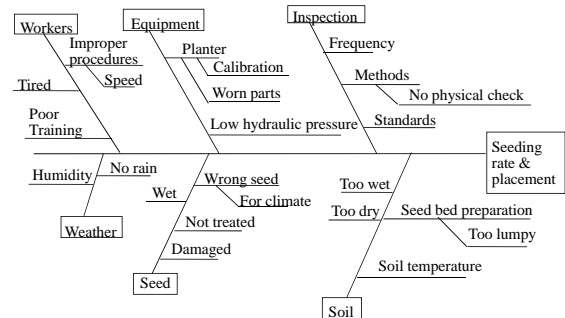
Farm Management: Principles and Strategies, Kent Olson, 2003

Illustrative CE Diagram for Soybean Enterprise Profitability



Note the desired outcome on the right.

Another Illustrative CE Diagram for Planting Operations



Note the intermediate outcome on the right.

## WHY CE diagrams?

- Provide an exhaustive list of sources of improvement.
- Trace improvements to source.
- Identify constraints to improvement.

Farm Management: Principles and Strategies, Kent Olson, 2003

## Tools for Process Improvement

Farm Management: Principles and Strategies, Kent Olson, 2003

## Implementing process improvement

1. Define quality attributes
2. Decide how to measure each attribute
3. Set quality standards
4. Establish appropriate tests
5. Find and correct causes of poor quality
6. Continue to evaluate and make improvements

Farm Management: Principles and Strategies, Kent Olson, 2003

## General Process Improvement Tools

1. Team building and group interaction tools
2. Specific process and technology tools

Farm Management: Principles and Strategies, Kent Olson, 2003

## Coarse-Grained Process Improvement Tools

3. Process Maps
4. Benchmarking
5. Check sheets and histograms
6. Pareto Analysis (and Pareto Charts)
7. Cause & Effect Charts (Fishbone Charts)

Farm Management: Principles and Strategies, Kent Olson, 2003

## Fine-Grained Process Improvement Tools

8. Fail-safe plans
9. Trend (or Run) Charts
10. Scatter Diagram and Correlation
11. Experiments and Trials

Farm Management: Principles and Strategies, Kent Olson, 2003