

**Creating a Decision Support System to
Support Production Decisions within the
Winter Wheat Supply Chain**

Christopher W. Zobel

Department of Management Science & Information Technology
Virginia Tech

Eluned C. Jones

Department of Agricultural and Applied Economics
Virginia Tech

Overview

- Background and problem description
- Decision-making in the wheat production process
- Role of Information Technology
- Development of the Decision Support System
 - development environment
 - illustration / demonstration

Background: Soft Red Winter Wheat

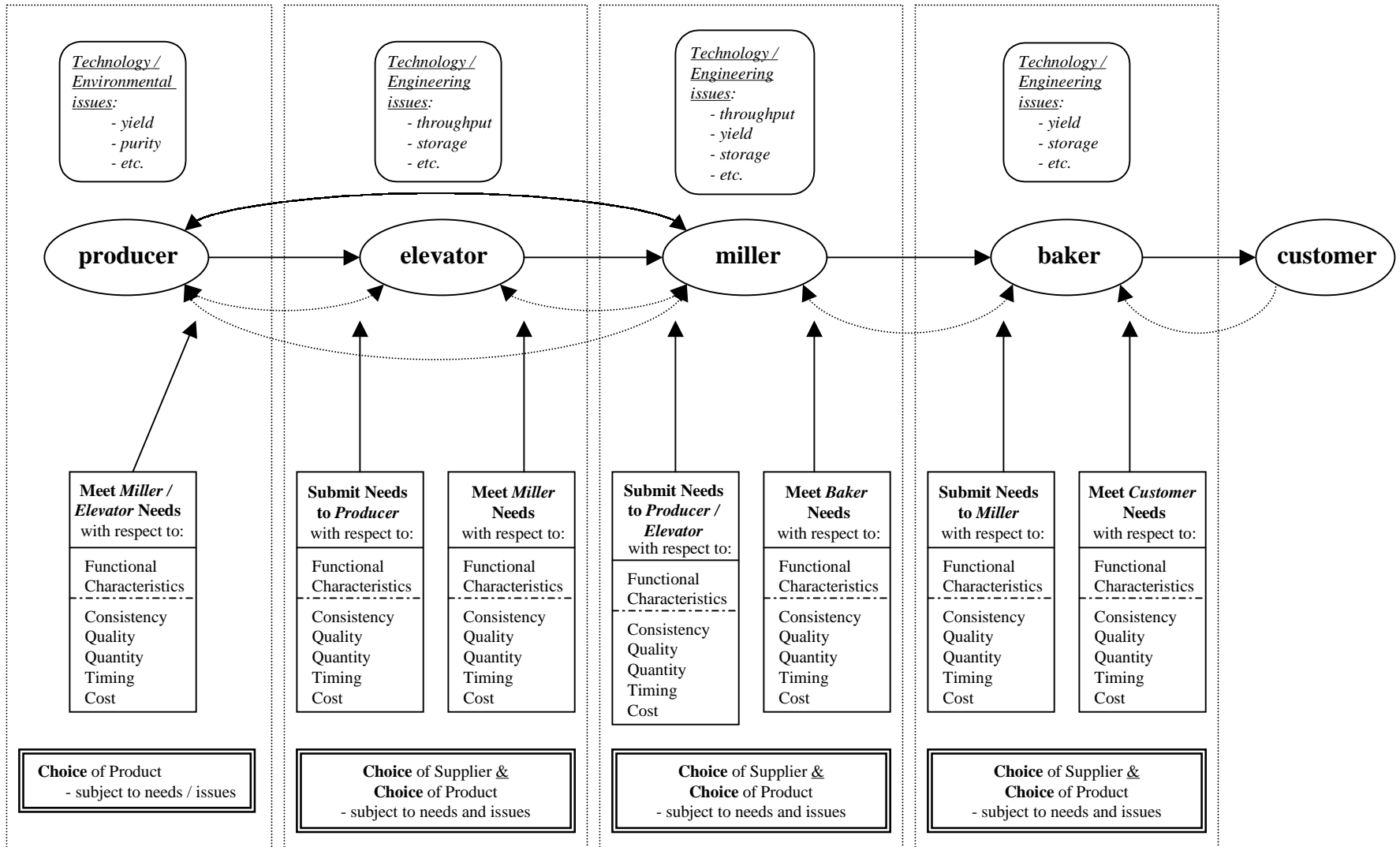
- Principle variety of wheat grown in Virginia
 - Oversupply and undervaluation
 - efforts not reflected in market
 - Uncertainty
 - Perdue purchase of Cargill facility
 - Breeding of new (better?) varieties
- => Need for structured decision-making to leverage opportunities

Decision-making in this process

- New focus on functional characteristics

Customers → Bakers → Millers → Producers

- Currently little communication between levels
 - What decision-making is necessary at each level?



System flow diagram for decision-making

Where does IT (IS) factor in?

- Decision support systems
 - organize and present information to support better decision-making

- Organization:
 - producer:
 - varietal characteristics not currently easily available
 - miller / baker:
 - monitor / control varietal and technological factors

Where does IT (IS) factor in?

- Presentation:
 - Initial DSS generator: Microsoft Excel
 - analytic capabilities
 - GUI capabilities
 - controller application
 - widely available
 - easy to use
 - Future possibilities: World Wide Web
 - on-line scripting (ASP / VBScript)
 - wider audience
 - precedent established

Illustration (?)

- Prototype development
- Very positive initial response

- Initial focus on Producer level
 - identification of appropriate varieties
 - **weighting factors**
 - **ranking**
 - **sensitivity**

ProValue: Decision Support for Value-Related Wheat Production Management

Product Types

- Cakes
- Cookies
- Crackers
- Bagels
- Donuts

SELECT

Associated Varieties

- Madison
- Wakefield B
- Massey**
- Saluda
- Pioneer 2580
- Jackson
- Sawyer
- AgriPro Foster

SELECT

Varietal Consistency

Milling Characteristics

Test Weight

Minimum

59.6 lb/bu

Maximum

60.8 lb/bu

Agronomic Characteristics

Expected Yield

69 bu/ac

Access Budget Calculator

Access Baseline Price

**BALKAN**

	Expected	Minimum	Maximum
Test Weight	63 lb/bu		
Adjusted Yield	75 bu/ac		
Softness Equivalent	36		
Protein %	9%		
Alkaline Water Retention Capacity	75		
Cookie Diameter	15		
Cookie Top Grain Texture	1		
Mixograph Water Absorption	58		

<< Previous

Next >>

Return to
main screenDisplay Varieties for
Specified Ranges

Wheat Varieties in the Specified Ranges



- 92PIN#109
- 92PIN#110
- FRENCH#1
- 92PIN#135
- NC94-7197
- KS85W663-42
- 92PAN1#22
- FRENCH#3
- 92PAN1#33
- 92PAN2#24
- PIONEER2643
- FRENCH#4
- 92PIN#130
- 92PIN#136
- 92PAN2#32
- 92PAN2#26
- 92PIN#125
- 92PIN#107
- 92PIN#111
- 92PAN2#19
- 92PIN#122
- FRENCH#5
- PIONEER2137
- 92PAN1#29
- 92PAN2#9

Return to Main
Screen

View Milling & Baking
Data for Selected
Varieties

View Agronomic
Data for Selected
Varieties

Return to Milling &
Baking
Characteristics

Return to Agronomic
Characteristics

ProValue DSS - Wheat Production Management

Home Budget Calculator Baseline Price

Arial 10 **B** *I* U [List Bullets] [List Squares] \$ % , +.00 -.00 [Align Left] [Align Right] [Grid] [Print] [Language]

	A	B	C	D	E	F	G
1	Select the Field for Comparison						
2							
3	Yield						
4							
5							
6	Variety	Test Weight	Adjusted Flour Yield	Softness Equivalent	Protein (%)	Alkaline Water Retention Capacity	Cookie Diameter
7							
8	92PIN#109	62	74	60	8	59	18
9	92PIN#110	63	72	60	8	60	18
10	FRENCH#1	60	76	56	7	58	19
11	NC94-7197	65	74	52	8	56	19
12	92PAN1#22	63	75	45	9	66	16
13	92PAN1#33	62	75	47	9	65	16
14	92PAN2#24	64	76	43	8	72	16
15	92PIN#130	63	76	44	10	70	16
16	92PIN#136	63	73	55	9	59	18
17	92PAN2#32	63	78	41	9	70	16
18							
19							

Continuing research

- Develop detailed decision-making process
- Implement producer-level decision aid
 - incorporate user feedback / suggestions
- Develop miller / baker / consumer levels of system
 - incorporate cross communication between levels

- Expand region of study
- Expand focus of study