

156
AN ECONOMIC STUDY OF SYSTEM STRESSES ON THE STORING AND
TRANSPORTATION OF KANSAS WHEAT DURING HARVEST

by

WARREN C. MEYER

B.S., Iowa State University, 1976

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Agricultural Economics

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1978

Approved by:

L. Orlo Saveman
Major Professor

Document

LD

206F

.R4

1978

M49

C.2

ACKNOWLEDGMENTS

I would like to express my appreciation to Dr. L. Orlo Sorenson, Major Professor, and to Drs. Milton Manuel and Frank Orazem for their helpful suggestions and constructive criticisms offered by them while serving as committee members.

Also to Miss Cheryl Rowley for her typing of the final manuscript.

To Patricia, my wife, I express appreciation for her encouragement and patience during my graduate work.

**THIS BOOK
CONTAINS
NUMEROUS PAGES
WITH DIAGRAMS
THAT ARE CROOKED
COMPARED TO THE
REST OF THE
INFORMATION ON
THE PAGE.**

**THIS IS AS
RECEIVED FROM
CUSTOMER.**

TABLE of CONTENTS

ACKNOWLEDGMENTS.....	ii
LIST of TABLES.....	v
LIST of FIGURES.....	vii
Chapter	
I. INTRODUCTION.....	1
Purpose of the Study.....	2
Objectives.....	3
Storage and Transportation of Wheat.....	4
A. Storage.....	4
B. Transportation.....	13
II. FUNCTIONAL SUB-SYSTEMS of the GRAIN MARKETING SYSTEM.....	27
Farm.....	27
Local Elevator.....	28
Transportation Agencies.....	29
Terminal Elevators (or Processors).....	29
III. POTENTIAL BOTTLENECKS or SYSTEM STRESSES OCCURRING DURING HARVEST, and THEIR CONSEQUENCES.....	31
Queuing of Farm Grain Trucks at the Local Elevator.....	31
Insufficient Storage Capacity Necessary to Accommodate the Volume of Grain Needing Storage at Harvest.....	32
Factors Contributing to the Development of Marketing Bottlenecks or Stress Situations During Harvest.....	35
A. Insufficient "timely" information on demands for services from the system.....	35
B. Variations occurring at each sub-system.....	47
IV. ALTERNATIVES and/or SAFEGUARDS AVAILABLE to the PARTICIPANTS PRIOR to, or DURING HARVEST; and THEIR COSTS...	64
Temporary Storage in On-Farm Facilities.....	64
"Sufficient" Available Storage Space at the Local Elevator.....	65
Transportation of Wheat to a More Distant Elevator During the Harvest.....	68
Trade-Offs Faced by the Farmer.....	70

V.	PROPOSALS for SYSTEM IMPROVEMENTS and AREAS of STUDY OFFERING POTENTIAL for FURTHER RESEARCH.....	73
	Improving the Allocation and Utilization of the Existing Freight Car Fleet.....	73
	Peak-Period Rates.....	76
	Improving the Receiving, Storing, and/or Shipping Operation at the Elevator.....	77
	Areas of Study Offering Potential for Further Research..	79
	CONCLUSION.....	83
	LITERATURE CITED.....	84
	BIBLIOGRAPHY.....	86

LIST of TABLES

Table	Page
1. Kansas Farm Storage Capacity.....	5
2. Intentions to Add Grain Storage Facilities on Kansas Farms in 1977.....	7
3. Summary of Survey of Kansas Elevators.....	8
4. Kansas Off-Farm Storage Capacity.....	14
5. Capacities of Off-Farm Grain Storage by States.....	15
6. Sample of Farm Trucks in South Dakota Stratified by Size and Age, 1974.....	17
7. Sample of Farm Trucks in South Dakota Stratified by Size and Annual Mileage, 1974.....	18
8. Number of Freight Cars in Service.....	19
9. Types of Freight Equipment.....	21
10. Average Freight Car Capacity.....	22
11. Average Freight Train Load.....	23
12. Average Annual Car-Day Activity, All Cars in Service, 1962-67.....	25
13. Average Daily Car Mileage.....	26
14. Kansas Grain Production.....	37
15. Total Stocks of Wheat by Quarters, Kansas, 1967-77.....	42
16. Stocks of Wheat Off-Farm by Quarters, Kansas, 1967-77.....	43
17. Stocks of Wheat On-Farm by Quarters, Kansas, 1967-77.....	44
18. Comparison of Percentage Change in Stocks of Wheat in Kansas on June 1, With Percentage Change in Kansas Wheat Production, by Years, 1967-77.....	46
19. Daily Precipitation Amounts (inches), Greensburg, Kansas; Kiowa County.....	49
20. Daily Precipitation Amounts (inches), Wellington, Kansas; Sumner County.....	51

Table	Page
21. Daily Grain Receipts (1977 Wheat Harvest), a Local Elevator in Kiowa County, Kansas (1977 Wheat Harvest).....	53
22. Daily Grain Receipts (1977 Wheat Harvest), a Local Elevator in Sumner County, Kansas (1977 Wheat Harvest).....	54
23. Approximate Weekly Pattern of Wheat Receipts in June and July at Nine Country Elevators in the Study Area.....	55
24. Carlot Receipts and Shipments of Wheat at Terminal Elevators in Kansas City.....	63
25. Carlot Receipts at Kansas City vs Kansas Wheat Production (% Change), 1974-77.....	62
26. Costs in Cents Per Bushel of Storing Grain, Using Weighted Average Standardized Book Values, at Country Elevators for Fiscal Years 1964-65 to 1977-78.....	69
27. Cost Functions of Grain Trucking.....	70