MARKETING ALTERNATIVES FOR COLORADO WHEAT PRODUCERS

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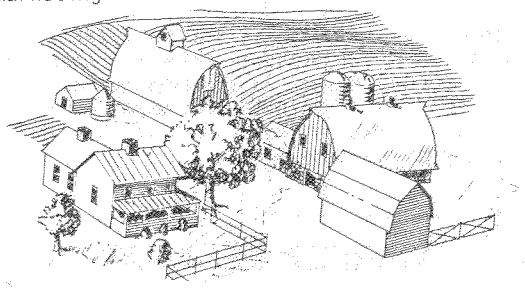
Neilson C. Conklin and William P. Spencer

I. INTRODUCTION

The marketing of a crop is as important to the farmer as its production. A bumper crop may be in vain if the producer does not receive an adequate price for it. It follows that a farmer must be an effective marketer as well as a producer. This is especially true for dryland wheat producers on the Colorado high plains. They, like farmers everywhere, must deal with price fluctuations. Additionally, Colorado producers must contend with unreliable weather patterns causing yields to vary as much as the price.

Wheat producers are "price-takers," and cannot individually affect the price of wheat. However, there are management alternatives at their disposal to aid in marketing a crop effectively. The use of these tools to increase the price of wheat by one cent at the farm can increase profit substantially. These tools include taking advantage of seasonal changes in the price and basis of wheat, using government programs, segregating high protein wheat and feeding wheat.

These marketing alternatives and some of the ways in which they can be used are presented in the following chapters. The purpose of this bulletin is to assist Colorado wheat producers in the development of their marketing skills.



II. REVIEW OF THE WHEAT INDUSTRY

The first step on the road to effective wheat marketing is an understanding of the industry. Colorado exports most of its wheat to other parts of the country and world. Therefore, an understanding of wheat flows and the wheat industry outside the state is important to the Colorado wheat producer.

Colorado Acreages and Yields

Wheat is a major crop in Colorado, comprising about 34 percent of total value of the crops produced. Wheat is harvested from about 50 to 60 percent of total planted acreage. In the United States, Colorado is the eighth largest producer of wheat with 4.6 percent of the total production. Recent trends in Colorado production, acreage and value are shown in Table 1.

Two trends over the past 10 years are evident in the Colorado wheat industry--(1) the increase in planted acres and (2) increasing wheat prices. Wheat prices have increased significantly over the last 10 years due to improved export sales and government programs designed to help producers cover rising production costs. The higher prices increased the relative profitability of wheat production and drew additional acres into cultivation.

Yields do not appear to have trended upward during the last decade. In fact, the average yields for the period 1976-1980 is below that of 1971-1975. Any technological gains that could have increased average yields were partially offset by the additional, less productive land being brought into production.

Table 1. Colorado Wheat Acreage, Yields and Values, 1971-1981

Year	Acreage Planted (mil. ac.)	Acreage Harvested % of Planted	Yield Per Planted Acre bu.	Production mil. bu.	Value/bu. $	Value/ Planted Acre $
1971	2.31	90	25.1	59.6	1.20	30.12
1972	2.47	88	21.0	52.0	1.77	37.17
1973	2.54	95	23.3	59.3	3.91	91.10
1974	2.84	93	23.6	67.8	4.00	95.60
1975	2.75	81	18.3	50.4	3.25	59.54
1976	3.15	77	17.0	53.4	2.36	40.12
1977	3.03	85	19.0	57.4	2.12	40.28
1978	3.04	83	19.5	59.3	2.81	54.80
1979	3.25	81	21.5	70.2	3.49	75.03
1980	3.55	96	31.0	109.9	3.75	116.25
1981	3.51	89	25.2	87.9	3.44	84.28
1982[1/]	3.48	88	25.3	87.5	3.30	73.26
Avg. 71-75	2.59	89	22.3	57.8	2.83	62.71
Avg. 76-82	3.26	86	22.2	73.0	3.04	69.15

[1/] Forecast

SOURCE: Colorado Crop and Livestock Reporting Service

Colorado Wheat Flow

Colorado State University, with the support of the Colorado Wheat Administrative Committee and the Denver Grain Exchange, conducts an annual survey to determine the destination, mode of transportation, and use of Colorado wheat.

The results of the 1981 Colorado Wheat Flow Study has been derived from 66 Colorado grain handlers and represented 85 percent of the total disappearance of Colorado Wheat in 1981.

DESTINATION

For the first time in several years the Gulf Coast was the largest market for Colorado wheat and received 44.34 percent of the total crop. Flows of wheat to this area increased by 22.3 percent over 1980 levels and 39 percent over 1976 levels. Grain trade representatives generally believe that the shift from West Coast markets to Gulf Coast markets was caused by a combination of changes in transportation rates and an increase in export demand from gulf shipping points. The Northwest Coast was the second largest market with 19.8 percent of the flow of Colorado wheat. In 1980 this region received 43.6 percent of the Colorado crop. There has been a gradual but significant decrease in the percentage of wheat being shipped to Kansas City since 1976. In 1976, 36.5 percent of the crop moved to the Kansas City area. By 1980 the amount shipped had decreased to 10 percent and this year Kansas City shipment represented only 4 percent of the total flow.

USE

This year exports accounted for 69.2 percent of the wheat produced in Colorado. Of this wheat 41.2 percent was exported from the Gulf Coast, a 26.1 percent increase from the 1980 level. In 1981 19.8 percent of the wheat was exported from the northwest coast as compared to 37 percent in 1980. Between 1976 and 1980 there was an increase of 22.5 percent of Colorado export wheat. Wheat used for milling represented 16.6 percent of the crop in 1981, comparable to 20 percent used for milling in 1980, but substantially lower than 1976 when 41 percent was used for milling purposes. It must be kept in mind that these are percentage figures and the crop in 1981 was much larger than in 1976. The actual number of bushels used in milling has increased; however, this is a smaller percentage of the crop.

Transportation

There are tremendous economies of scale for transporting wheat. It is much cheaper to ship a bushel of wheat from the West Coast to Japan than it is to ship one from Colorado to the West Coast. The first few miles a bushel of wheat is transported are the most expensive. As wheat moves through the marketing channel, the size of the shipment increases and freight rates per bushel per mile declines.

Table 2 shows the ocean freight rates. From it, one can see that the overseas shipping rates never exceed $1.045 per bushel to any destination. From Colorado it costs as much to move wheat to Gulf and West Coast destinations as it does to ship wheat from U. S. ports to overseas markets.

CHART 1:
% TOTAL OF COLORADO WHEAT BY MARKET DESTINATION

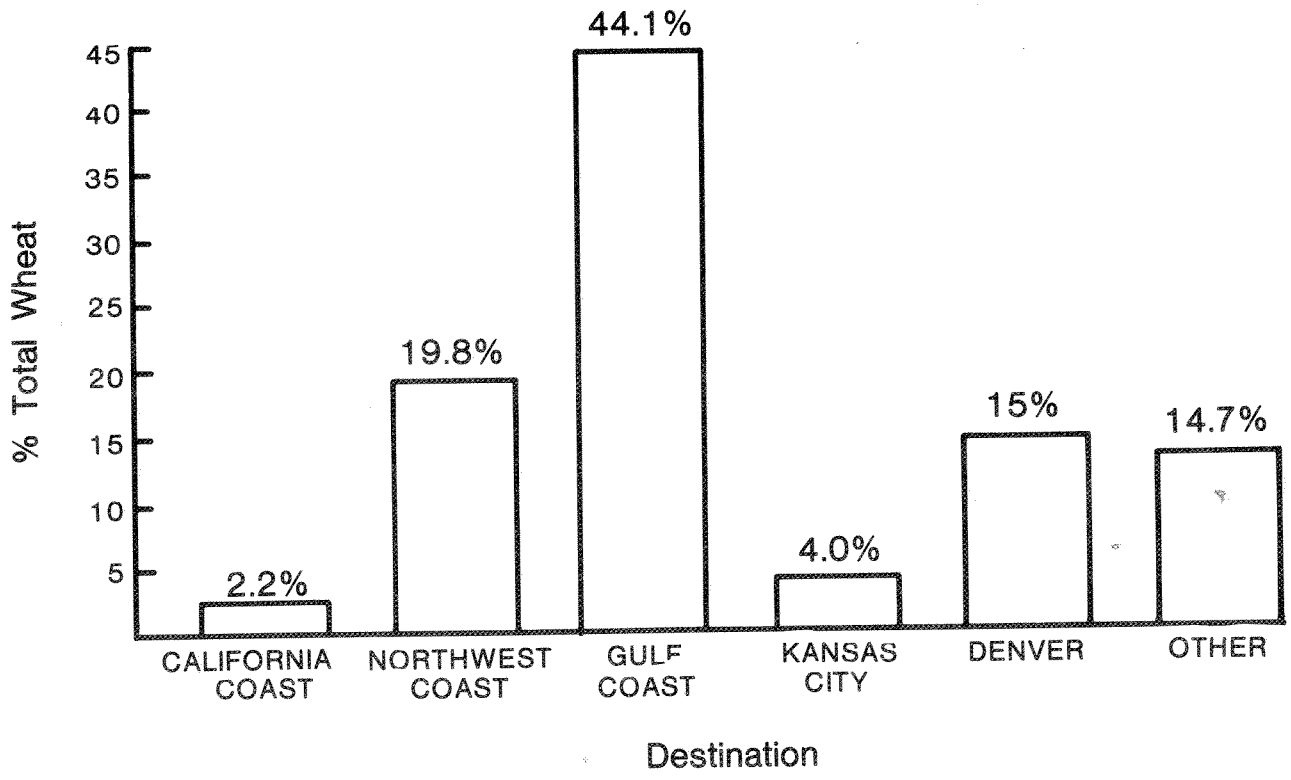
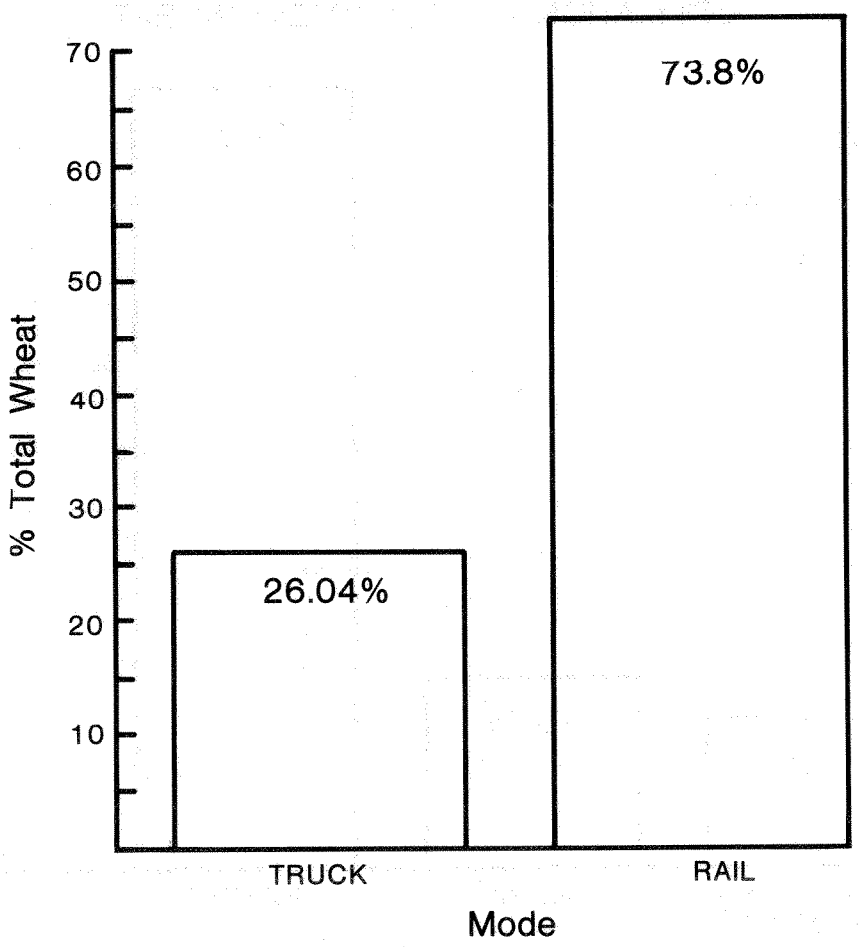
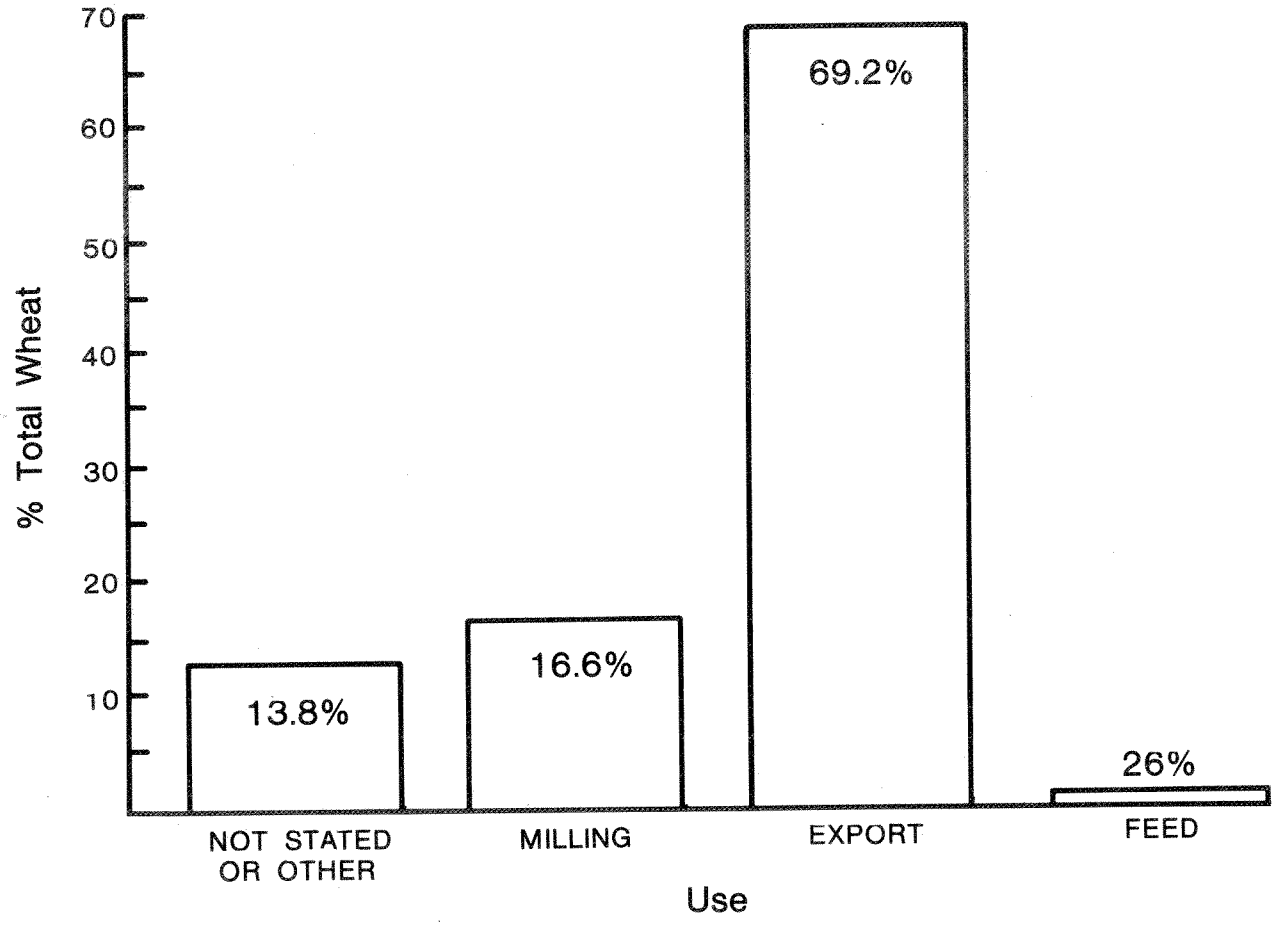


CHART 2:
MODE OF TRANSPORTATION OF COLORADO WHEAT



★ Due to rounding error, totals do not exactly equal 100.0%

CHART 3:
UTILIZATION OF COLORADO WHEAT



Practically all of Colorado's wheat moved by rail in 1981. Out of the wheat destined for the Gulf Coast 99.5 percent was moved by rail freight and 82.4 and 98.8 percent of the wheat going to California and Northwest Coast respectively was all shipped by rail. The rail usage for wheat shipped to Kansas City bound wheat traveled by rail while in 1980 only 34.7 percent moved by means of the railroad. In 1981, the percentage of wheat traveling to Kansas City by rail increased to 56.4 percent. In general, there has been a decrease in truck usage for Colorado wheat shipments between 1976 and 1981.

Trucks are generally less expensive for short and medium range hauls. Also, smaller lots of grain can be shipped by truck. With the federal deregulation of the trucking industry, (making back hauls easier to obtain) medium range hauls, like Kansas City, can be as economical as the railroad. Rising fuel prices, however, are negating the gains from increased competition brought on through deregulation.

U. S. Production and Use

U. S. wheat supplies, disappearance, area and prices for the years 1978-1982 are shown in Table 4. Domestic food use has remained fairly stable in the 600 million bushel range. Feed use has declined considerably while exports have increased over 25 percent and show promise to increase even more. Ending stocks, however, have not decreased, leaving the farm price relatively stable in the $3.50 to $4.00 area. The price gains from increased exports have been offset a good deal by increased production.

International Production and Use

A summary of world wheat production, exports, and U. S. export destinations are shown in Figure 1.

Table 2. Ocean Freight Rates for U. S. Wheat on Selected Routes

From	To	Per Long Ton	Per Bushel
U.S. Gulf	Rotterdam	8.25	
U.S. Gulf	Soviet Union	14.75	
U.S. Gulf	Egypt	12.00	
U.S. Gulf	Pakistan		
Pacific Coast	Pakistan		
U.S. Gulf	India	27.50	
Pacific Coast	India	24.00	
U.S. Gulf	Japan	24.00	
Pacific Coast	Japan	16.75	
Pacific Coast	South Korea	17.00	

increasingly significant as a factor in world trade. In 1982-83, combined imports of the U.S.S.R. and China are forecast to account for a third of the world wheat trade and a quarter of the coarse grains.

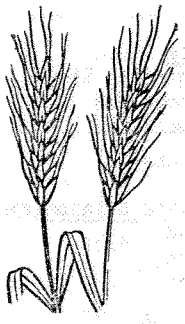
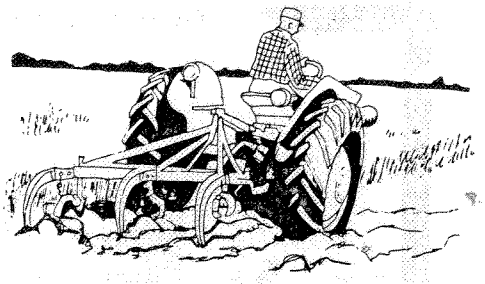


Table 3. Colorado Rail Freight Rates.*

Location	R.R.	Wheat to Denver	Corn, Milo and Wheat to Kansas City	Export Wheat to Pacific Northwest			Export Wheat to Gulf Ports[1]		
				(single car)	(27 car)	(54 car)	(single car)	(27 car)	(54 car)
Julesburg	U.P.	$.294	$.654	$1.104	$1.026	$1.002	$1.41	---	---
Holyoke	B.N.	.258	.678	1.164	1.026	1.002	1.41	$.906	$.870
Wiley	A.T.S.F.	.744	.768	1.44	(to California ports only)		1.038	.978 (1 in, 60 out)	(30 cars)
Burlington	Cadillac	$375 flat fee to Limon and .162 per bushel beyond	---	$375 +: 1.056	.978	.948	---	---	---
Cheyenne Wells	U.P.	.264	.636	1.104	1.026	1.002	1.362	---	---
Holly	A.T.S.F.	.768	.714	1.44	(to California ports only)		1.038	.96 (1 in, 60 out)	(30 cars)
Fleming	B.N.	.222	.732	1.164	1.026	1.002	1.41	.924	.894
Haxtun	B.N.	.234	.708	1.164	1.026	1.002	1.41	.912	.876
Towner	M.P.	.804	.648	---	---	---	1.098	---	.924

*Rates per pushel and ex parte 003 level of October 1981.
[1]Transit rate - allows shipper to stop shipment prior to destination for processing or sale with reshipment to original destination at the same rate.

The Soviet Union is the world's single largest producer of wheat, with the U. S. a close second. The sum of the U.S.S.R , U.S.A., Canada, France, Australia, and Argentina's production represents 50 percent of the world production. Wheat is grown in nearly every country with a temperate climate and therefore, the bulk of world production comes from many small producers.



Although the Soviet Union produces the most wheat, it is not a significant wheat exporter. The U. S. produces the majority of the wheat and flour in the world markets. Australia, Canada, and Argentina also export significant amounts of wheat and flour. About 50 percent of the U.S. exports go to the Asian continent with the other 50 percent divided between Europe, the Western Hemisphere and other destinations. The major Asian buyers are The People's Republic of China, Japan, Taiwan and The Republic of Korea (South).

In recent years as can be seen by Figures 2 and 3, imports by the U.S.S.R. and China have become

Table 4. Wheat: Supply, Disappearance, Area and Prices, Marketing Years 1978-1982*

Item	1978/79	1979/80	1980/81 (Prel.)	1981/82	1982/83 (Proj.)	
			Million Bushels			
Supply						
Beginning Stocks, June 1	1,178	924	902	989	1,159	
Production	1,776	2,134	2,370	2,793	2,811	± 35
Imports[1]	2	2	2	3	2	
Total	2,955	3,060	3,274	3,785	3,972	± 35
Domestic Disappearance						
Food	592	596	614	600	610	± 5
Seed	87	101	114	112	105	± 5
Feed[2]	158	86	48	137	125	± 50
Total	837	783	776	849	840	± 55
Exports[1]	1,194	1,375	1,510	1,773	1,700	± 150
Total Disappearance	2,031	2,158	2,286	2,622	2,540	± 175
Ending Stocks, May 31	924	902	988	1,163	1,432	± 175
			Million Acres			
Area						
Planted	66.0	71.4	80.4	88.9	87.2	
Harvested	56.5	62.5	70.9	80.9	79.0	
Set-Aside and Diverted	9.6	8.2	-	-	-	
Allotment/National Program	58.8	70.1	75.0	81.1	-	
			Bushels Per Acre			
Yield Per Harvested Acre	31.4	34.2	33.4	34.5	35.6	
			Dollars Per Bushel			
Prices						
Received by Farmers	2.97	2.78	3.96	3.65	3.40-3.55	
Loan Rate	2.35	2.50	3.00	3.20	3.55	
Target Price	3.40	3.40	3.63	3.81	4.30	

[1]Imports and exports include flour and other products expressed in wheat equivalent.

[2]Residual, approximates feed use and includes negligible quantities used for distilled spirits.

*Totals may not add due to rounding

Source: USDA, Wheat Situation

Figure 1. World Wheat and Wheat Flour Supply and Demand

U. S. Wheat Exports by Destination

(June/May -- 1,000 Tons)

	1978/79	1979/80	1980/81	1981/82 Total Exports	1981/82 Committed as of 6/18/81	1982/83 Committed as of 6/17/82 1/
EC-10	2,308	2,372	2,490	2,478	383	537
Other W. Europe	940	1,298	1,155	2,213	252	249
Eastern Europe	681	2,847	1,230	554	124	---
USSR	2,604	4,422	3,000	6,539	---	300
China	2,618	1,616	8,700	7,950	2,505	2,657
Japan	3,306	3,095	3,530	3,414	704	683
Rep. of Korea	1,637	1,815	2,050	1,821	321	251
India	3	---	26	1,580	---	---
Egypt	1,393	1,249	1,600	2,483	196	134
Nigeria	852	1,024	1,140	1,272	340	374
Mexico	885	1,015	1,100	767	267	---
Brazil	1,696	2,194	2,170	3,115	753	1,079
Chile	759	817	1,000	1,020	526	130
Others	11,021	11,839	10,121	11,904	4,152	4,937
Total Wheat Excl. Products	30,703	35,603	39,312	47,110	10,523	11,331

1/Accumulated shipments and sales, excluding sales for next marketing year.
Source: FAS/USDA

USSR: GRAIN IMPORTS FROM MAJOR SUPPLIERS

m. tons

Suppliers	1978/79	1979/80	1980/81	1981/82 (estimated)	1982/83 (forecast)
Argentina	1.4	5.1	11.1	13.4	11.5
Australia	0.1	4.0	2.9	2.7	0.5
Canada	2.1	3.4	6.8	9.2	9.5
EEC	0.2	0.9	1.2	1.9	3.5
USA	11.2	15.2	8.0	15.5	10.5
Total	15.1	30.4	34.0	45.0	39.0 a/

SOURCE: USDA

TOTALS MAY NOT ADD DUE TO ROUNDING.

CHINA: GRAIN IMPORTS FROM MAJOR SUPPLIERS*

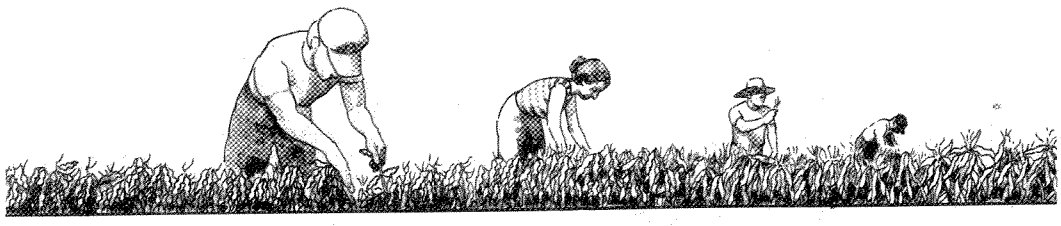
m. tons

Suppliers	1978/79	1979/80	1980/81	1981/82	1982/83 (forecast)
Argentina	0.9	0.5	0.2	0.3	0.6
Australia	1.4	3.7	1.4	1.5	1.6
Canada	3.2	2.6	2.9	2.8	3.6
EEC	-	0.1	0.6	0.1	1.0
USA	5.5	4.0	9.7	9.0	8.6
Total	11.2	10.9	14.8	13.7	15.6

SOURCE: USDA

* Wheat and coarse grains.

TOTALS MAY NOT ADD DUE TO ROUNDING.



III. MARKETING MANAGEMENT

Today the wheat farmers' income depends as much on their marketing skills as it does on their production management. Wheat producers make their first marketing decision when they plant a crop. This decision means that they will, if the weather is favorable, have a crop which must be sold.

From the time the crops are planted until the last of the wheat is sold, the farmers have many alternative times and ways to sell wheat. Marketing alternatives include the government programs, futures markets, forward contracting, and storage of harvested wheat; these are just a few of the alternatives available. These marketing alternatives offer farmers the opportunity to select many different prices rather than accept a single price for the crop. By selecting prices over a longer time horizon, taking advantage of seasonal price changes and selling at the best location, a skillful marketer can increase and protect the profitability of the farming enterprise.

If wheat prices were stable and the price relationships between alternatives did not change then the farmer's decision would be a simple one, choose the alternative yielding the highest net price or revenue. However, the farmer faces a dynamic world in which prices and price relationships are constantly changing, and marketing decisions must be made with this price risk in mind. Under these conditions a wheat producer cannot make decisions that simply maximize the profit. Instead the producer must balance the potential profit from each marketing alternative against the risk that this profit may be lower or higher than initial expectations.

The amount of risk that individual farmers are willing and able to bear in making marketing decisions varies widely. This depends on the financial position of the farmer as well as personal preferences and attitudes. For this reason marketing strategy which is right for one wheat producer may be wrong for the neighbor down the road. Each farmer must evaluate marketing alternatives, comparing their potential risks and returns and develop a marketing plan that is found acceptable.

Developing a Marketing Plan

There are two steps in developing a marketing plan, (1) collecting information and (2) developing a way of using this information to choose among the available marketing alternatives. The farmer developing a marketing plan needs information about production costs and the risks and returns of potential marketing alternatives. Once the farmer has this information the possible strategies to develop for marketing are limited only by imagination and the ability to bear risk.

A knowledge of production costs provides a reference point against which per bushel prices with different risks may be compared. For some farmers, higher net receipts with some inherent risk may be preferable to a low net receipt which is certain, while for others the opposite may be true. The choice of marketing alternatives may also be influenced by cash flow requirements. Thus, the farmer needs information on annual production costs, including the distribution of these costs throughout the year.

The calculation of production costs (continued in the following section) is a familiar and straightforward process. Collecting information about marketing alternatives, and especially about their risks is not as easy. For marketing alternatives which do not have fixed prices the farmer must bracket the expected price from the alternative with some measure of variation. Two commonly used measures include (1) the standard deviation (how widely a price fluctuates around its average) and (2) the range (how far apart are the historical maximum and minimum).

Once this information is collected it must be reevaluated and updated on a continuing basis. From the moment the crop is planted, until the final truckload is sold, the farmer must use this information in deciding when and how to market wheat. As long as any of the crop is not sold the farmer is exposed to the risk of price changes. The alternatives offered by futures markets, forward cash contracting and government programs enable the farmer to price all or part of the crop at any time of the year.

In order to enforce discipline in their marketing some producers set a series of pricing goals or triggers. These goals are usually based on production costs, a realistic assessment of the market situation, and the individual's willingness to accept risk. When the price of wheat associated with one of the marketing alternatives reaches a trigger price the farmer sells a certain percentage of the crop. Producers using this type of plan generally have rules which limit their sales before the crop is harvested to allow for crop failures. They may also incorporate timing triggers to help meet cash flow needs. Unfortunately, there are no fixed rules which insure success in grain marketing. However, information can help. The rest of this bulletin presents information which should help Colorado wheat producers evaluate risks and returns of wheat marketing alternatives.

The Cost of Production

Knowledge of production costs is essential to the wheat producer evaluating marketing alternatives. Each producer's wheat enterprise and cost structure is distinctly different from other producers. For example, rates of input use and machinery requirements may change dramatically between producers. Such differences can be properly accounted for in a budget. The sample budget in Table 5 shows the costs of production for dry land winter wheat on summer fallow in southeastern Colorado.

Production costs borne by the producer are divided into direct (variable) costs and indirect costs (fixed) costs. Receipts from the sale of wheat minus direct costs are net receipts. Net receipts are what is left over to pay for the fixed factors of production (i.e., capital, labor and land) with any residual constituting a return to the operator's management and risk. In this example the farmer owns the farm and hires no outside labor, other than custom combining services which are a direct cost.

These net receipts may then be allocated to fixed factors of production as shown at the bottom of Table 5. In this example, returns to capital are allocated at a real interest rate of 5 percent. A real (inflation adjusted) interest rate is used since the value of owner's equity should be increasing with inflation. From the payment to capital, interest payments are deducted. Principal payments are not included since these represent savings through increased owner equity. Similarly returns to labor and land are allocated with the remaining sum representing

Table 5. Sample Budget[1]

Winter Wheat on Summer Fallow
Southeast Colorado Dryland

	Unit	Price or Cost/Unit	Quantity	Value or Cost Per Acre	Cost Per Unit of Production	Your Farm
Gross Receipts From Production:						
Wheat	Bu.	3.50	30.00	105.00		
Total Receipts				105.00		
Direct Costs:						
Operating--Preharvest:						
Seed	Bu.	5.00	.500	2.50	.08	
Mach Fuel & Lube	Acre			3.58	.12	
Mach Repairs	Acre			1.39	.05	
Interest on Op. Cap.	Dols	.165	4,378	.72	.02	
Total Preharvest				8.19	.27	
Operating-Harvest:						
Cust Comb & Haul	Acre	18.00	1,000	18.00	.60	
Interest on Op. Cap.	Dols	.165	7.5	1.24	.04	
Total Harvest				19.24	.64	
Total Operating Costs				27.43	.91	
Indirect Costs:						
Machinery Replacement	Dols			18.13	.60	
Machinery Taxes & Insurance	Dols			2.76	.09	
General Farm Overhead	Dols			10.00	.33	
Real Estate Taxes	Dols			2.50	.08	
Total Property Ownership Costs:	Dols			33.39	1.11	
Total Costs:				63.82	2.13	
Net Receipts--Factor Payments				41.18	1.37	

Distribution of Factor Payments:

	Total Factor Payments		Paid To Others		Returns To Operator
Capital (5.00%)	8.08	Less interest paid	0.00	Equals	8.08
Labor (.39 hrs)	2.29	Less hired labor	0.00	Equals	2.29
Land (4.00%)	10.00	Less rent paid	0.00		
		Interest paid	0.00	Equals	10.00
Management & Risk	20.81	Less paid management	0.00	Equals	20.81
Total	41.18		0.00		41.18

[1]Source: Dr. Norman L. Dalsted, Extension Farm Management Specialist, Colorado Enterprise Budgets.

a return to the owner's management and risk. From these factor payments hired labor, rent, interest on land loans and hired management must be subtracted. In some cases interest and rent payments may exceed the factor payments. This implies a negative return to these resources.

These adjusted factor payments represent a return to the operator. Their total is what the farm owner has available for family living expenses or additional new investments in the farm enterprise. Note: the principal paid on loans does not constitute a cost in this analysis. The cost of replacing machinery and equipment is reflected as a machinery replacement cost, as is building maintenance.

The farmers who formulate a marketing plan should calculate their own costs of production. Tables 6 and 7 contain the labor and machinery requirements by month used to generate the budget in Table 5. The direct operating costs can be used to calculate a break-even price at the expected market price. Break-even price and yield in this example are shown at the bottom of Table 8. These break-even points simply show what price or yield farmers must receive to cover direct operating costs of planting and harvesting the crop.

As the farmer plans the annual marketing strategy, the break-even price may be used as a starting point. From there, farmers should evaluate at what price they will be able to make any payments to factors of production, borrowed capital, land rents, mortgages and hired labor. This type of analysis will enable farmers to do a better job of evaluating the risks and returns

Table 6. Labor and Machinery Requirements

ANNUAL LABOR REQUIREMENTS

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Machinery Labor	HR.	0.00	0.00	0.00	0.00	.08	0.00	.07	.15	.09	0.00	0.00	0.00	.39

FUEL REQUIREMENTS

Gasoline	GAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.02	0.00	0.00	0.00	.02
Diesel	GAL	0.00	0.00	0.00	0.00	.58	0.00	.48	1.06	.58	0.00	0.00	0.00	2.71

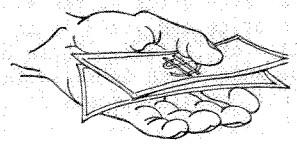
MACHINERY REQUIREMENTS

Tract 2WD 55 HP	HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.01	0.00	0.00	0.00	.01
Tract 2WD 160 HP	HR	0.00	0.00	0.00	0.00	.08	0.00	.06	.14	.08	0.00	0.00	0.00	.35
Chisel 15+ (2.0)	HR	0.00	0.00	0.00	0.00	.07	0.00	0.00	.07	0.00	0.00	0.00	0.00	.14
Harrow-Spike (2.0)	HR	0.00	0.00	0.00	0.00	0.00	0.00	.06	.06	0.00	0.00	0.00	0.00	.11
Grain Drill 15+ (1.0)	HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.07	0.00	0.00	0.00	.07
Grain Wagon (1.0)	HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.00	0.00	0.00	0.00	.00

The Numbers in parentheses are total times over for that machine.

Table 7. Machinery Fixed and Variable Costs Per Hour

Machine	HP/ Size	Perform Rate Hour/ Acre	Pur./ Price	Depr./ Hour	Int./ Hour	Ins./ Hour	Taxes/ Hour	Total Owner Ship/ Hour	Repair Cost/ Hour	Fuel Cost/ Hour	Lub. Cost/ Hour	Oper. Cost/ Hour
Tract 2WD 55 HP	55.00	1.000	13585.	1.907	1.055	.127	.225	3.314	1.114	4.338	.651	6.103
Tract 2WD 160 HP	160.00	1.000	45760.	6.071	3.250	.392	.683	10.396	3.809	8.755	1.313	13.878
Chisel 15+	30.00	.069	235.	.184	.074	.009	.018	.285	.112	0.000	0.000	.112
Harrow-Spike	40.00	.057	35	.032	.025	.003	.007	.066	.006	0.000	0.000	.006
Grain Drill 15+	40.00	.069	530	.947	.347	.042	.079	1.415	.281	0.000	0.000	.281
Grain Wagon	200.00	.005	5000.	2.154	1.428	.172	.373	4.127	.939	0.000	0.000	.939



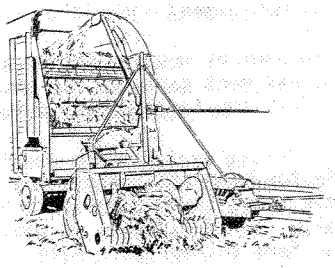


Table 8. Monthly Summary--Cash Flow

	Unit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Total Receipts	Dol.	0.	0.	0.	0.	0.	0.	105.	0.	0.	0.	0.	0.	105.
Direct Operating Costs:														
Seed	Dol.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00	2.50
Cust Comb & Haul	Dol.	0.00	0.00	0.00	0.00	0.00	0.00	18.00	0.00	0.00	0.00	0.00	0.00	18.00
Gen Farm Overhd	Dol.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	10.00
Real Estate Tax	Dol.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	2.50
Interest on Oper. Cap.	Dol.	0.00	0.00	0.00	0.00	.16	0.13	1.31	.15	.21	0100	0.00	0.00	1.96
Tract Fuel & Lube Cost	Dol.	0.00	0.00	0.00	0.00	.76	.76	.57	1.33	.76	0.00	0.00	0.00	4.19
Tractor Repair Cost	Dol.	0.00	0.00	0.00	0.00	.24	.24	.18	.42	.24	0.00	0.00	0.00	1.32
Equipment Repair Cost	Dol.	0.00	0.00	0.00	0.00	.25	.25	.02	.32	1.58	0.00	0.00	0.00	2.42
Total Dir. Operating Costs	Dol.	0.00	0.00	0.00	0.00	1.41	1.39	20.13	2.22	5.29	0.00	0.00	12.50	42.94
Net Cash Flow	Dols	0.00	0.00	0.00	0.00	-1.41	-1.39	84.87	-2.22	-5.29	0.00	0.00	0.00	68.38
Break-Even Price: @ 30 Bu/A	Dols	2.13												
Break-Even Yield: @ 3.50/Bu	Bu.	18.24												

associated with their marketing alternatives. The effect of a bad outcome from a risky marketing alternative will be easier to evaluate.

The timing of wheat sales depends critically on cash flow needs as well as market price. By analyzing a cash flow summary a farmer may schedule crop sales prior to periods when cash outlays occur. A monthly cash flow summary for our example wheat farm is shown in Figure 8. While this farmer was assumed to sell an entire crop at harvest, the cash flow situation would not appear that this decision was a necessity.

A novice who has developed an enterprise budget, knows the cost of producing wheat and cash flow needs is progressing toward developing a marketing plan. The next step will present the producer with several, oftentimes confusing, ways to market the crop. There are government programs, futures markets, forward cash contracts, and markets at different locations. Before choosing among these alternatives, the wheat producer needs to collect information about them. This is the next step in formulating a marketing plan.

IV. MARKETING ALTERNATIVES

Not all marketing alternatives are suitable for every producer. Each wheat farmer is in a unique situation and should evaluate all of the alternatives available, selecting those which best meet those personal needs. The purpose of this chapter is to familiarize farmers with many of the alternatives available to them. These alternatives include:

1. government programs;
2. spacing sales over the crop year using futures markets, forward cash contract, and storage;
3. marketing to terminals;
4. segregating high protein wheat and
5. feeding wheat to livestock.

1983 Wheat Program

In July 1982, USDA announced the details of the 1983 acreage reduction program (ARP) for wheat. Basically, the program was a spinoff of 1982's ARP provisions with some added requirements and benefits to encourage higher producer compliance than the 48 percent in 1982. A grower had to reduce wheat acreage for harvest by at least 20 percent of the farm base to be guaranteed the $4.30-a-bushel target price and $3.55 loan. A new feature was an advance payment of 50 percent of an estimated deficiency payment to be paid at signup time.

In last August, Congress altered the 20 percent ARP to 15 percent but added a 5 percent cash land diversion. The diverted acres would receive $2.70 a bushel times the farm yield, and half the payment could be made at signup. The 1983 wheat loan was raised to $3.65 a bushel, but the target price remained at $4.30.

To conclude the 1983 acreage reduction effort, a Payment-In-Kind (PIK) program was announced in January. This provision aims at reducing production and simultaneously cutting burdensome surplus stocks. It was also designed to avoid increasing federal budget outlays. In brief, the Commodity Credit Corporation (CCC) will offer farmers an amount of wheat representing a percentage of their base program yield per acre. In exchange, producers will take additional land out of production, beyond that in the 15 percent ARP and 5 percent cash land diversion. Payments will be in terms of No. 1 wheat and will come from stocks represented by outstanding regular CCC loans, farmer-owned reserve loans, or CCC owned inventories. The payment amount will be determined by multiplying the designated PIK acreage by the farm program yield by 95 percent. A farm's whole base may be eligible for PIK under a bid system. Other PIK provisions include the following.

1. Initially a producer may participate by reducing acreage by an amount from 10 to 30 percent of the base. Producers may also submit bids to designate the whole farm base to the PIK program; bids will be accepted or rejected at the discretion of CCC. In no case can more than 50 percent of a country's base be idled in conserving use acres.

2. Haying and grazing will be permitted on winter wheat planted prior to January 12 that is designated to meet any conservation use requirements, provided the farm is participating in the PIK program for any crop.

3. Under summer fallow rules, PIK acreage will have to be land which would have been planted in 1983.

4. Producers participating in PIK with outstanding price support regular or reserve loans must agree to allow CCC to use loan collateral for PIK payment. The amount made available must be at least equal to the PIK payment.

5. A producer with no outstanding CCC loans may receive the PIK from wheat stored in an approved warehouse or, at CCC's discretion, may be required to put 1983 grain under loan for the PIK requirements.

6. To provide the producers with marketing flexibility, CCC will pay storage at an annual rate of 26.5 cents a bushel from when the PIK grain is received until disposition, but not for more than five months.

7. Producers that liquidate farm-stored reserve loans will be eligible to receive a payment equivalent to seven months storage.

8. Conservation use acreage requirements vary according to the planted area. An example for a 100-acre wheat base with 50 acres planted includes 15 acres under the ARP, five acres under the CLD, and 30 acres under PIK, for a total of 50 acres.

Provisions of the 1983 reserve program, which were announced simultaneously with PIK, include the following.

1. Entry will be permitted only after the nine-month regular loan period.

2. The reserve loan rate will be the same as the regular loan--$3.65 a bushel. Storage payments will remain at 26.5 cents per bushel per year.

Tools for the Timing of Sales

Pricing a crop before harvest time is one of the strategies a farmer may use to reach the price goals established in the marketing plans. This is possible because there are two marketing tools available which allow the farmer to extend the "selling season", forward cash contracts and futures markets. Both of these alternatives may be useful in a marketing program since each has its own unique advantages and disadvantages. Similarly, the storage of wheat may be used to extend sales beyond harvest time. Futures markets, forward cash contracts or government programs may be used to help manage the price risks associated with holding wheat in storage. The following section is an introduction to the use of these tools in timing wheat sales.

Futures Markets

Futures trading serves two important economic functions in the wheat market by providing a mechanism for price discovery and a means of transferring unwanted price risks. Futures markets fulfill their price discovery role by providing a central location where traders buy and sell futures contracts in response to information about world wide supply and demand for wheat. Since prices are established for future deliveries, these markets provide opportunities for producers, wheat merchants and processors to hedge their positions in cash grain, thus avoiding the risk of adverse price movements during the time the wheat is growing or in storage. One of the advantages of using the futures market is that the crop or part of the crop can be priced months in the future.

Futures contracts for wheat are traded on four organized commodity exchanges in the United States: The Chicago Board of Trade, The Mid-America Commodity Exchange, The Minneapolis Grain Exchange and The Kansas City Board of Trade. The relevant futures market for most Colorado wheat producers is Kansas City since the futures contracts traded there call for the delivery of 5,000 bushels of hard red winter wheat. These standardized contracts are traded for delivery in five months: September, December, March, May and July. The first future delivery month of the wheat marketing year is July, while May is the last delivery month. These two contracts are sometimes referred to as the "new crop" and the "old crop" futures."

The difference between the futures price of a given delivery month and a local cash price (cash-futures) is referred to as the "basis." The basis is simply the local cash price quoted in the number of cents above or below a designated futures price, usually the price of the closest delivery month. The basis to the closest delivery month is referred to as the "near" basis. Understanding the local basis and its behavior is critical to the farmer who uses futures markets in a marketing program. Additionally, the basis provides important economic signals to farmers who may not use futures markets at all.

The basis may be interpreted as the discount (or premium) from Kansas City wheat futures at which wheat is traded locally. The basis generally reflects transportation and handling costs from the local elevator to Kansas City, storage costs between today and the delivery month of the futures contract, and local demand-supply conditions. The basis is generally weakest (discounts are largest) at harvest time. This is due to large volumes of grain moving to local elevators and heavy demands on the transportation system. As the marketing year progresses, local cash discounts to futures shrink, the basis strengthens. Although the basis has seasonal patterns, local demand and supply conditions or transportation problems can cause significant changes in the basis. Historical basis tables for Denver and Limon are presented in Table 9 and 10. The net price received by a farmer who is using futures markets as a pricing or hedging tool depends on the local basis. (A glance at Tables 9 and 10 shows how widely the basis can fluctuate with changes in storage costs, transportation costs and other variables in the wheat marketing channel).

For example, during the five marketing years from 1977 to 1982 the Denver basis was strongest (Denver discount to futures the smallest) at 40 cents during January of 1979. It was weakest during September of

1981, when the average discount Denver from the near Kansas City wheat future was $-1.05. Since the basis fluctuates and the farmer will now know the basis in advance a futures market hedge is not riskless.

Fortunately, the basis is more predictable in behavior than cash or futures prices alone. As mentioned above the basis is generally weakest at harvest time and at Denver is usually the strongest during the months January and February. One statistical measure of variation in the basis, the coefficient of variation, is included in the table.

The coefficient of variation is a measure of fluctuation in the basis as a percent of the average basis. The higher the coefficient of variation for a given month the more volatile the basis will tend to be during that month. The Denver basis, as shown in Table 9 tends to be most volatile during the months of March, April and May. A farmer using futures markets to hedge could help to control risk by planning to lift the hedge during months when the basis is less volatile.

The wheat futures market at Kansas City provides the Colorado wheat producer not only with useful price information but also with opportunities to hedge stored grain or to forward price a part of the wheat crop. Both of these transactions are defined as hedging, using the futures market as a temporary substitute for a future intended cash transaction. The farmer who wishes to store newly harvested crop for sale the following spring may hedge wheat by selling March or May futures contracts. Similarly, the sale of July or September contracts may be used to pre-price a portion of the wheat crop at the time planting decisions are being made. These hedging alternatives will be discussed in more detail later in this chapter.

A Colorado wheat producer making such a transaction on the futures market does not actually have to deliver wheat to Kansas City. In fact, futures contracts are seldom delivered on. Instead, the original commitment to deliver wheat may be offset by purchasing futures contracts equal to the number previously sold. Then, the wheat may be sold on the local cash market.

Table 9. Denver Wheat Basis Kansas City Board of Trade, Near Future Monthly[1]

Market Year	June	July	August	September	October	November	December	January	February	March	April	May	Annual Average
1977/78	-.60	-.48	-.40	-.52	-.55	-.54	-.51	-.50	-.43	-.42	-.53	-.48	-.50
1978/79	-.55	-.52	-.42	-.42	-.42	-.44	-.41	-.40	-.43	-.42	-.41	-.49	-.44
1979/80	-.58	-.58	-.62	-.71	-.63	-.58	-.70	-.85	-.82	-.92	-.76	-.78	-.71
1980/81	-.67	-.85	-.87	-1.05	-1.03	-.86	-.85	-.60	-.54	-.61	-.58	-.68	-.76
1981/82	-.73	-.83	-.64	-.66	-.70	-.52	-.60	-.45	-.46	-.31	-.35	-.19	-.54
5 Year Average	-.63	-.65	-.59	-.67	-.67	-.59	-.61	-.56	-.54	-.54	-.53	-.52	5 yr
Coefficient of Variation[2]	11%	28%	32%	36%	34%	27%	28%	32%	30%	45%	30%	43%	

[1]Source: Denver Cash Prices, Rocky Mountain News and Grain and Feed Market News, USDA. This basis series was calculated using AGNET, Agricultural Computer Network.

[2]The percentage by which the basis varies around its average. Larger percentages indicate the basis is more variable during that month.

Table 10. Limon, Colorado, Wheat. Basis Kansas City Board of Trade Near Wheat Future, Monthly Average[1] 1977 - 1982

Market Year	June	July	August	September	October	November	December	January	February	March	April	May	Annual Average
1977/78	-.69	-.61	-.57	-.64	-.65	-.67	-.61	-.53	-.46	-.43	-.51	-.55	-.58
1978/79	-.52	-.54	-.48	-.49	-.48	-.47	-.45	-.54	-.59	-.50	-.51	-.60	-.51
1979/80	-.76	-.60	-.75	-.84	-.85	-.68	-.81	-.93	-.91	-.93	-.87	-.99	-.83
1980/81	-.93	-.97	-1.03	2/	2/	2/	2/	2/	-.78	-.86	-.79	-.80	-.88
1981/82	-.83	-.91	-.89	- 90	-.91	-.83	-.82	-.69	-.69	-.51	-.53	2/	-.77
5 Year Average	-.75	-.73	-.74	-.72[3/]	-.72[3/]	-.66[3/]	-.67[3/]	-.67	-.69	-.65	-.64	-.74	-.74
Coefficient of Variation	20%	27%	30%	26%	27%	22%	26%	28%	25%	36	30%	27%	23%

[1]Source: Cash prices were obtained courtesy of the Limon Coop Exchange and the efforts of Ricky Gordon, Elbert County Extension agent. The basis series was calculated using AGNET, Agricultural Computer Network.

[2]No cash price available.

[3]Four-year average.

[4]The percentage by which the basis varies around its average. Larger percentages indicate the basis is more variable during that month.

Forward Cash Contracts vs. Futures Markets

Forward cash contracts enable a farmer to sell his grain to a local elevator several months prior to delivery. Unlike futures contracts, in which all terms except price are standardized, all of the terms in a forward cash contract are negotiable. Thus, a forward cash contract may be tailored to meet the specific needs of a wheat farmer. Additional advantages of a forward cash contract include:

- a location specific price;
- no margin money required;
- no commissions to be paid;
- personal contact with the buyer.

Disadvantages of forward cash contracts include:

- lack of flexibility, since the grain must be delivered;
- delivery is tied to a specific time and location;
- a heavy discount on the delivery basis;
- little protection against default by the elevator.

Pricing grain prior to harvest time by the sale of futures contracts offers flexibility in marketing that a farmer gives up by using forward cash contracts. Futures markets have the following advantages:

- transactions normally may be offset by any time;
- hedges may be moved forward if grain is stored following harvest;
- grain can be sold where and when the farmer can get the best local cash price;
- minimum risk of default.

However, futures markets have disadvantages as a pre-harvest pricing tool:

- additional costs including margin money and commissions;
- standardized quantity and quality of grain;
- no provision for a location specific price;
- are not familiar to many farmers;
- the risk of adverse basis changes.

Futures markets are a more flexible pre-harvest pricing tool than forward cash contracts. Therefore, they offer both greater risk and greater potential for profit. The following simple example shows how a farmer might evaluate the relative merits of a forward cash contract and the sale of futures contracts.

Preharvest Pricing

In January, a Colorado wheat farmer examines Kansas City September Wheat Futures reports and notes that the closing price is $4.05. The producer knows the break-even price is $3.20 per bushel and that the net receipt goal is $3.25. Having kept records of the local basis, the farmer knows that over the last five years the local September basis has averaged 70 cents in July. However, it has been as wide as $1.00 and as narrow as 51 cents. Based on current market information, the farmer expects the basis (local cash discount from September futures) at harvest to be close to the 70 cents average. Therefore, if the farmer prices part of the crop by selling futures contracts, the expected local cash price at harvest is $3.35 ($4.05 - $.70) as shown in Table 11.

Table 11. Forward Cash Contract vs. Futures Market Hedge

Forward Cash Bid Delivery Third Week in July	September Futures Price KCBT[1/]	Basis
	$4.05	-$.80 (Bid)
$3.25	-$ .70	-$.70 (Expected)
$3.25 Currently Available Local Price	$3.35 Expected Localized Price	

[1/] Kansas City Board of Trade

This expected price is higher than the $3.25 the farmer can lock in by making a forward cash sale to the local elevator. The futures market hedge offers potentially greater profits and a greater risk than the forward cash contract since the basis may be wider than the expected 70 cents. Which alternative will the farmer choose? This depends on the farmer's attitude toward risk and the capacity to take risk.

Assume that the wheat farmer chooses to price 5,000 bushels of crop by selling one contract of September wheat on the Kansas City Board of Trade at $4.05. As shown in Table 12, the expected basis (local cash discount) at harvest is 70 cents. Therefore, the expected localized price at which the farmer hedges 5,000 bushels of the crop is $3.35. On July 20, the farmer is ready to sell wheat. The farmer delivers 5,000 bushels to the local elevator and receives $3.05/bushel. At the same time, the farmer's broker is called and given instructions to buy back one contract of September wheat. The broker is able to execute this transaction at $3.77. Since the futures price has fallen since January, the farmer gains 28 cents per bushel on futures transaction, even though the grain was sold for 20 cents per bushel less than the forward contract price in January. After subtracting 2 cents per bushel for interest on margin and commissions, the farmer receives a net return of $3.31 per bushel. This can also be calculated by subtracting the actual basis on July 20, 72 cents, from the futures price at which the hedge was placed in January, $4.05.

In this case, the farmer improved net receipts by using a futures market transaction rather than a forward cash contract. This, however, is not always the case. Decisions on whether to use futures markets or forward cash contracts must be made carefully with a good understanding of the local basis.

Post-Harvest Marketing Alternatives

Whether or not the producer pursues a pre-harvest marketing strategy, there is the option to sell or store the wheat at harvest. The wheat producer will likely sell it to the local elevator and take the price they offer. Selling the wheat at harvest does not indicate a lack of marketing considerations by the farmer. Many sell at least part of their crop at harvest to retire operating debt, which is especially important when interest rates are high. Also, some producers lack their own storage facilities and commercial storage may be available only at a high cost.

Table 12. Pre-Harvest Pricing Hedge Example

Cash	Futures	Basis at Harvest
January 10 Crop in Ground Forward Cash Bid $3.25	Sell One Contract (5,000 bushels) September Wheat @ $4.05	-$.70 (Expected) -$.80 (Bid)
July 20 Sell Cash Wheat $3.05	Buy Back September Futures @ $3.77	-$.72 (Actual)
Sale of Wheat $3.05	Gain on Futures $ .28 Commission and Interest on Margin -.02 $ .26	

Sale of Wheat	$3.05
Plus Gain on Futures	.26
Net Return Per Bushel	$3.31
Futures Price at Time of Sale	$4.05
Less Actual Basis	.72
Less Commission and Interest on Margin	.02
Localized Cash Price	$3.31

Net Return Per Bushel = Localized Cash Price

Direct Marketing

Farmers can bypass the local elevators and save the handling fees by selling directly to the larger markets at Denver and Kansas City. This direct marketing alternative has merits if the producer can move the wheat to a terminal market at a lower cost than the handling charges of local elevator operators. Local elevators, however, are frequently farmer-owned cooperatives, (nonprofit) making them very competitive when it comes to transporting wheat.

The first requirement for analyzing direct marketing is the determination of the handling charge. For illustrative purposes, assume the wheat is being shipped by rail to Kansas City. Assume the Kansas City price is $4.56 and the Colorado price is $3.70--leaving a basis of 86 cents. The rail rate is about 70 cents per bushel from Colorado shipping points (see Table 3, page 11) leaving a margin of 16 cents.

The computed handling margin is avoided if the producer markets direct, however, numerous costs are incurred in direct marketing. An elevator has costs of perhaps 10 cents per bushel simply to receive wheat by trucks and load out by rail. Additionally, the elevator often finances the sale from the time the producer is paid until the load reaches Kansas City and the payment is delivered. Risks of rapid price decline, wheat lost during shipment and grading at lower than expected levels are borne by the elevator company. These costs are large enough that most producers generally sell to local elevators.

Often, direct marketing to Denver is profitable for eastern Colorado producers -- cash wheat prices in Denver are normally significantly higher than local elevators around the state. Many producers in the more western counties of eastern Colorado have underutilized farm and semi-trailer trucks. They can frequently move wheat to Denver themselves at a rate lower than the basis between their local elevator and Denver. The profitability of this depends on the farmer's proximity to Denver and the personal trucking costs.

Store and Speculate

Wheat prices tend to be seasonal; that is, prices tend to rise in the months following harvest, peaking during the months of December and January, and then lowering toward harvest. With this in mind, farmers often store wheat and speculate that the seasonal rise in price on the cash market will exceed the costs of storage. Primary costs of storage are: (1) fixed expenses per year for owning storage, and (2) variable expenses per month associated with interest charges on the wheat inventory being stored. Those returns and costs are evaluated here for a typical Colorado wheat producer.

Other benefits and costs are possible but will not be analyzed. A major benefit of wheat storage is the postponement of income reporting. A farmer using the cash basis of income accounting does not have to pay income taxes on wheat produced in the current year if the crop is not sold until January of the following year. Therefore, income reporting and tax payments are delayed one year. By leveling out income reported, taxes are also reduced. Possible costs include the loss of stored wheat to insect and heat damage.

The seasonal behavior of wheat prices varies from year to year. The average price increase for the years 1971 to 1980 is shown in Table 13. The highest price is generally reached in the month of January at 36 cents per bushel over the July price. The average price rise is also shown on Chart 4. It is important to remember that the seasonal price rises shown in Table 13 are a 10-year average and give no indication of how the seasonal price will change in any given year. Every year has unique demand conditions, particularly in export demand, and price changes within the year reflect this.

Table 13. Average Monthly Price Change from July for Colorado Wheat, (Cents Per Bushel)

July	0	February	33
August	17	March	25
September	25	April	10
October	29	May	3
November	29	June	-1
December	35	July	0
January	36		

A major influence on grain storage decisions is the interest rate. The return from storage should be greater than the interest accumulated on either an operating loan or an alternative investment. Assuming a farmer has no tax reasons for holding wheat past December, the opportunity cost of storing wheat must be considered as well as the actual storage costs.

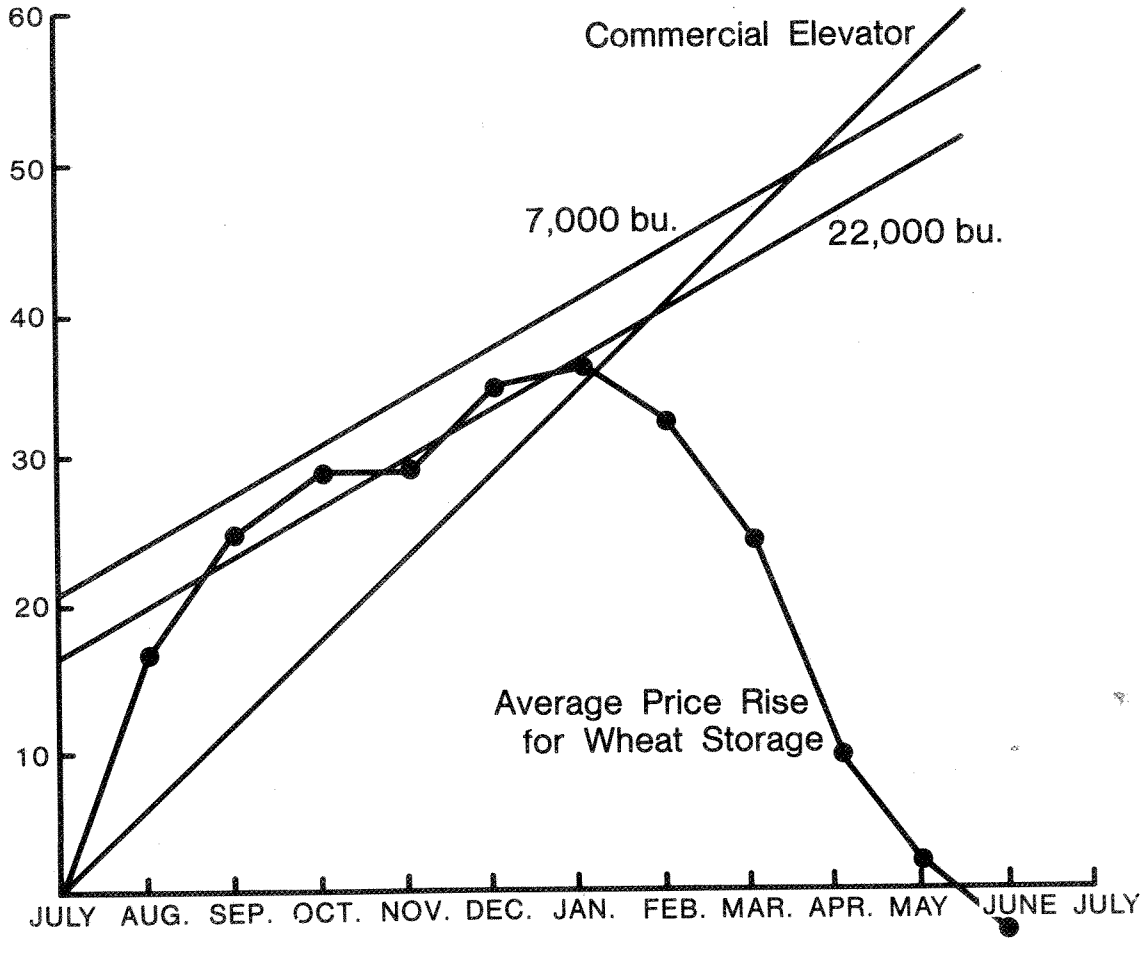
Table 14 illustrates this opportunity cost. It assumes a storage period of six months. The return on storage, then must be at least as high as its opportunity cost. For example, a farmer is offered $3.50 to

Table 14. Opportunity Cost of Storing Wheat

Interest Rate	3.00		3.50 (Cents Per Bushel at Harvest)		4.00		4.50	
	1 mo.	6 mos.	1 mo.	6 mos.	1 mo.	6 mos.	1 mo.	6 mos.
9%	2 1/4	13 1/2	2 1/2	16	3	18	3 1/3	20
12%	3	18	3 1/2	21	4	24	4 1/2	27
15%	3 3/4	22 1/2	4 1/2	26	5	30	5 1/2	34
18%	4 1/2	27	5 1/4	31 1/2	6	36	6 3/4	40 1/2

CHART 4

AVERAGE PRICE INCREASE FOR COLORADO WHEAT AND COSTS FOR ELEVATOR AND BIN STORAGE



sell wheat at harvest. The offer is rejected and the wheat stored, hoping for a price increase in the future. If the farmer is paying on a 15 percent operating note, a 26 cents price increase is needed over the next six months to profit from storage. Alternatively, if there was no operating loan outstanding, the wheat could have sold at harvest and the cash invested in the money markets at 15 percent. If elevator storage costs were 25 cents per bushel per month, 15 cents for six months, wheat prices would have to increase by a total of 41 cents, to $3.91, to pay storage costs.

If grain bins are owned by a wheat producer, fixed ownership costs are incurred. Initial costs are shown in Table 15 for bins with capacities of 7,000 and 22,000 bushels. A 7,000 bushel bin is considered small and could be used for segregating high protein wheat. The 22,000 bushel bin is a standard size bin, common in eastern Colorado. The total investment in bin construction is near $1.20 per bushel for the small bin to 95 cents for the standard bin. The annual cost over a 25-year life for the bin and interest on investment is $.152 per bushel for a 7,000 bushel bin and $.115 per bushel with a 22,000 bushel bin as shown in Table 16. Other annual costs of storage include labor for loading and unloading, additional transportation of wheat to the bin, and wheat shrinkage during storage. Adding these costs to the annual costs of the bin results in a total fixed expense of 21 cents and 17 cents per bushel for the smaller and larger bin, respectively.

Table 15. Typical Costs for Grain Storage Bins.

Capacity, Bushel	Cost*	Cost/Bushel
7,000	$ 8,400	$1.20
22,000	19,800	.95

SOURCE: Western Sales, Loveland, Colorado

*Includes flat-floored bin, sweep auger, transportation, concrete and installation. These costs are estimates and can vary between farms and purchase options.

Table 16. Annual Costs for Wheat Storage with Ownership of Grain Storage Bins.

Capacity, Bushel	7,000	22,000
Annual Costs/Bushel:		
Interest and Depreciation[1]	$.153	$.115
Labor[2]	.011	.011
Transport to Bin[3]	.007	.007
Shrink[4]	.035	.035
Total Annual Costs/Bushel	$.21	$.17

[1]Annual interest and principal payment over 25 years, assuming a 12 percent interest rate.

[2]Labor for loading and unloading bin at 450 bu./hr. @ 5.00/hr. plus two hours cleanup.

[3]Three-mile haul with 450 bushel truck @ $1 per mile.

[4]One percent shrink with $3.50 wheat.

The costs of storage are summarized in Figure 4. The costs for bin storage are estimated as the fixed annual cost, as shown in Table 16, plus interest charges. Interest here is estimated at 12 percent for $3.50 per bushel of wheat -- about 3.5 cents per month. For commercial storage, costs are considered as the actual cost plus interest charges. A typical elevator charges anywhere from 2 to 2.5 cents per month storage. In two analyses 1.5 cents are used. Add 3.5 cents per month for interest and commercial storage totals about 6 cents per month.

From Figure 4 it is apparent that, on the average, a small wheat storage bin (7,000 bushels) is not profitable for normal storage. A standard 22,000 bushel bin is marginally profitable. It appears to pay slightly from the months of September through January -- with the exception of November. Renting commercial storage space appears to be the most profitable storage strategy given the conditions of this analysis. It is more profitable than farmer-owned bins in every month in the September through January time period -- especially in September.

The question of why anyone would buy their own storage as opposed to renting it should be addressed. One reason is the limited space available in commercial elevators. Many country elevators do not have the capacity to store large amounts of wheat. Additionally, if farmers sell their wheat through the reserve program, country elevators may be reluctant to store it for three years. Another reason for farmers owning their own storage is government assistance that subsidized construction of storage facilities. Past USDA administrations have had a liberal policy in granting assistance for this, specifically in the form of ASCS low-interest loans. Some storage buildings are also eligible for investment credit treatment on income taxes -- lowering the effective purchase price of the facility. Finally, the building can sometimes be depreciated rapidly through accelerated cost recovery for tax purposes -- also lowering their effective price.

Storage and Hedging

An alternative to storing wheat and speculating on a seasonal increase in cash wheat prices is to store wheat and hedge it by selling futures market contracts. This strategy involves locking in a return to storage through the strengthening of the cash basis over the marketing year.

The cash basis is the difference between a commodity's local cash price and its price at a designated month on the futures market. The basis usually reflects storage costs between the current time and the month the futures contract expires. It also reflects transportation costs between the local market and futures market location, as well as local demand and supply conditions. The basis between the May, 1981, Kansas City wheat contract and the Denver cash price is calculated by subtracting the May futures price from the Denver cash price, as shown in Table 17.

The graph of this basis, shown in Figure 5, makes it clear that the May basis was weakest, at the greatest discount, during September and October and significantly strengthened in March and April. On September 25, 1980, the May basis hit its weakest point at $1.43 below the futures. It was strongest, 49 cents, on March 26, 1981. The basis strengthened 94 cents during this six-month period. In 1980-81, the Denver May basis followed a typical seasonal pattern. From this analysis, it is apparent that the

basis is weakest in the months immediately following harvest. It is strongest in the spring, during the months preceding harvest. While the May basis generally follows this pattern, its behavior may vary significantly from year to year.

Often a return to storage can be realized by taking advantage of this strengthening of the basis. When the basis is weak, during post-harvest, farmers should consider storing wheat and hedging -- selling an equal amount of wheat on the futures market. Later in the marketing year when the basis has strengthened, the wheat in storage is sold and the futures contract is bought back. The change in the basis during this time is the return to storage.

An example of this store and hedge strategy (using the data in Table 17) is shown in Tables 18 and 19. A farmer harvests wheat near July 10 and has the alternative of selling or storing the wheat. The

Table 17. Weekly Cash Wheat, Denver, Kansas City May Wheat Futures Prices, and the Basis, July 10, 1980, to April 30, 1981

	MAY 1981 FUTURES		
Date	May Futures	Denver Cash	May Basis
7/10/80	4.60	3.44	-1.16
7/17/80	4.68	3.48	-1.20
7/24/80	4.64	3.48	-1.16
7/31/80	4.72	3.61	-1.11
8/07/80	4.75	3.48	-1.27
8/14/80	4.78	3.56	-1.22
8/21/80	4.76	3.53	-1.23
8/28/80	4.82	3.59	-1.23
9/04/80	4.95	3.66	-1.29
9/11/80	5.00	3.69	-1.31
9/18/80	5.04	3.77	-1.27
9/25/80	5.22	3.79	-1.43
10/02/80	5.09	3.71	-1.38
10/09/80	5.18	3.80	-1.38
10/16/80	5.30	3.82	-1.42
10/23/80	5.41	3.02	-1.39
10/30/80	5.36	3.13	-1.23
11/06/80	5.28	4.08	-1.20
11/13/80	5.27	4.08	-1.19
11/20/80	5.36	4.15	-1.21
12/04/80	5.08	4.04	-1.04
12/11/80	4.44	3.48	- .96
12/18/80	4.73	3.92	- .81
1/08/81	4.83	4.06	- .77
1/15/81	4.89	4.08	- .81
1/22/81	4.73	3.96	- .77
1/29/81	4.63	3.82	- .70
2/05/81	4.64	3.99	- .65
2/12/81	4.55	3.98	- .57
2/19/81	4.69	3.90	- .79
2/26/81	4.57	3.69	- .88
3/05/81	4.35	3.81	- .54
3/12/81	4.38	3.79	- .59
3/19/81	4.38	3.76	- .62
3/26/81	4.36	3.87	- .49
4/02/81	4.41	3.85	- .56
4/09/81	4.45	3.83	- .62
4/16/81	4.43	3.88	- .55
4/23/81	4.47	3.78	- .69
4/30/81	4.35	3.75	- .60

Table 18. Expected Return to a Storage Hedge

May Futures Price, July 10	$ 4.60
Expected Basis, February 10	- .65
Seven Months Storage Cost @ $.06/Bu./Mo.	- .42
Expected Net Localized Price, February 10	$ 3.53
Current Local Cash Price	$-3.44
Expected Net Return to Storage Hedge	$ .09/Bu.

local (Denver) cash price is $3.44 per bushel and the May futures price at Kansas City is $4.60 -- leaving a basis of $1.16. Based on past experience, the farmer expects the Denver basis to strengthen to 65 cents by February. Thus, the expected net price in February would be $3.53 (May Futures price - expected basis - storage cost), a net gain of 9 cents/bushel.

The farmer decided to store 5,000 bushels of wheat and sells an offsetting May futures contract. The results of this storage hedge are shown in Table 19. Since the basis narrowed more than expected, the farmer made 8 cents/bushel more than the original calculation. The transactions cost of this hedge are not included in these tables, but should amount to not more than 3 cents/bushel.

This storage hedge enabled the farmer to earn a return to storage without exposing the farmer to the risk of a major decline in prices. A risk factor is present in the storage hedge strategy. The basis might not have strengthened by as much as expected. In this case the basis narrowed more than usual and additional profits were realized by accepting this basis risk. While returns to a storage hedge in the 1980-81 marketing year were excellent, this will not always be the case and a storage hedge strategy should be evaluated carefully each year. Although their use has not been discussed, forward cash contracts or CCC loans can also be used to reduce the price risk of storing wheat.

Segregating High Protein Wheat

The value of wheat is partly determined by milling and baking qualities. Higher wheat protein levels give better baking quality and improved loaf volume. Higher protein wheat has traditionally received premium prices, but the amount of these premiums vary greatly from year to year. High protein wheat is defined as 13 percent protein as opposed to "ordinary" wheat at 11.5 percent. Thirteen percent wheat has a demand and supply of its own. Demand is based on its superior baking qualities -- needed by some miller, both domestic and foreign.

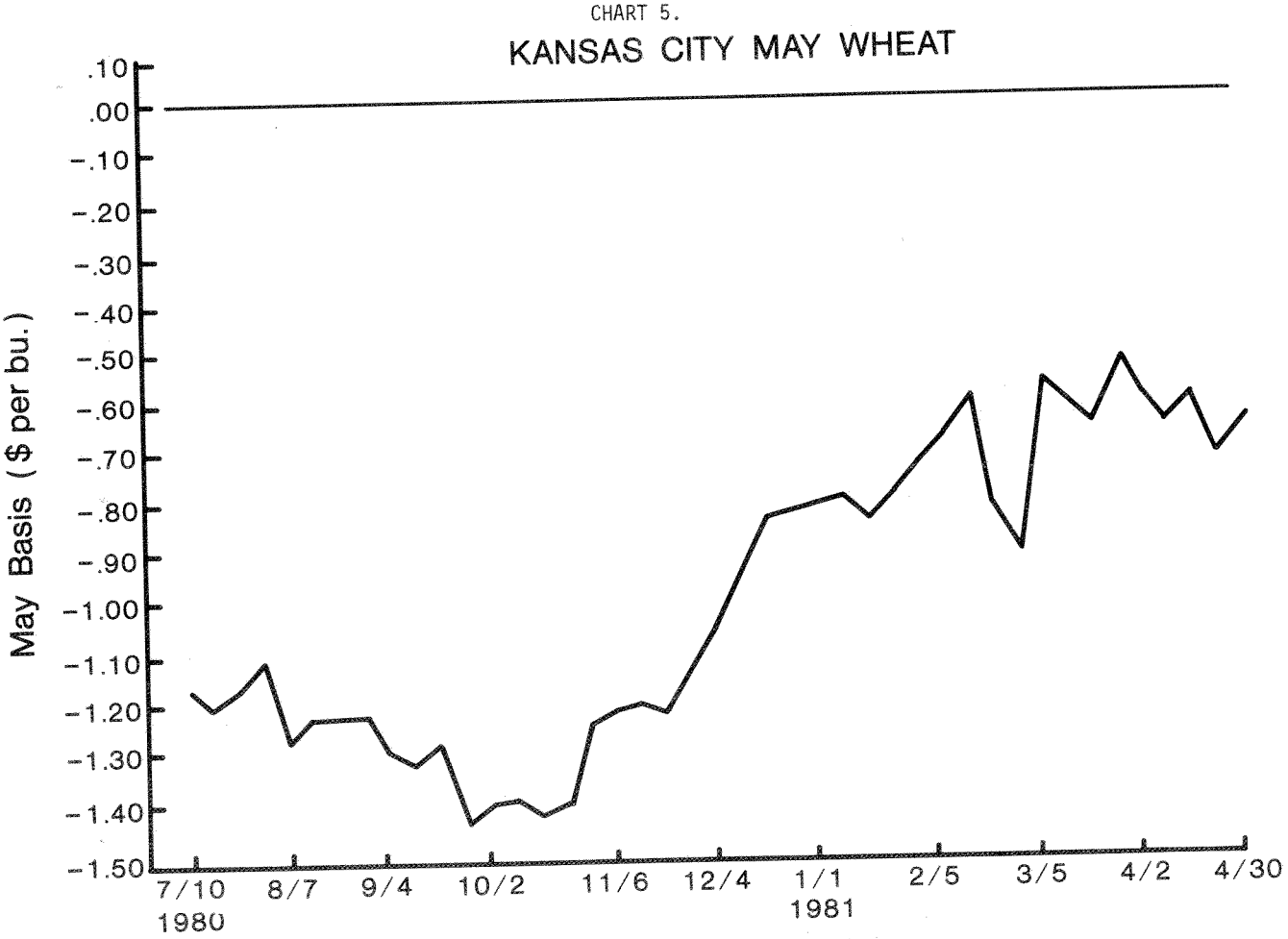
In the past, supply has been weather regulated. In the times of widespread drought, protein premiums tend to be low. Drought reduces yield, and high levels of protein are associated with low yields. The reason for this is the level of nitrogen in the soil. In dry years, there is less nitrogen leaching through the soil profile. A nitrogen build-up occurs and increased protein levels result. Chart 6 shows the relationship between nitrogen and protein levels. Since most colorado wheat producers do not irrigate and are

Table 19. Storage Hedge Example

Date	Cash Market	Futures Market	Basis
July 10	Store 5,000 Bu. Wheat Denver Cash Wheat $3.44/Bu.	Sell 1 May Futures Contract @ $4.60	-$1.16
February 12	Sell 5,000 Bu. Wheat in Denver @ $3.98	Buy 1 May Futures Contract @ $4.55	-$ .57

	Increase in Value of Cash Wheat $ .54	+ Gain on Futures $ .05	=	Gross Return to Storage $ .59
	Gross Return to Storage $ .59	- Storage Costs $ .42	=	Net Return to Storage $ .17

CHART 5.

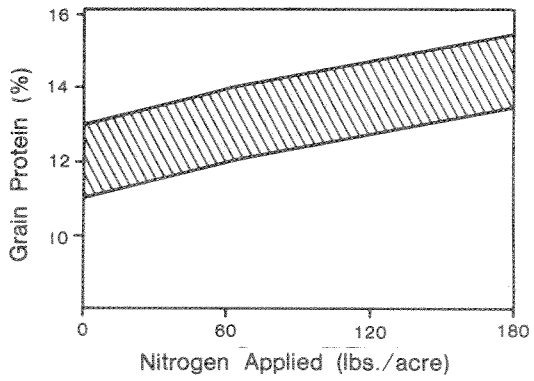


dependent upon the weather for moisture, they have little control over the protein levels of their wheat. Few dryland farmers deliberately strive for high protein wheat at planting time.

Chart 6 has some important implications for irrigated wheat producers. Possibly, in the future, farmers will be able to regulate their protein levels by use of nitrogen fertilizer. Although heavy nitrogen applications promote excessive foliage growth and lodging, it can be negated by newer semi-dwarf varieties of irrigated wheat that resist lodging.

In many years, profit can be increased by segregating high protein wheat from ordinary. Over the last 11 years the average protein premium for 13 percent wheat has been about 16 cents. This varies greatly from year to year and within the year. In years without widespread droughts, 1974 through 1977, the premium has been fairly high. In 1974-75, it averaged 46 cents per bushel. It can vary within the year due to future crop expectations and changing demand conditions. Most of the current Colorado preium bids come from export sources based on the West Coast -- predominantly Asian markets.

Chart 6. Wheat Protein Percentages as Related to Nitrogen Fertilization.



SOURCES: Irrigated Winter Wheat in Western Kansas and Montana Wheat Quality--Fertilizer Relationships.

Table 20 is a sample analysis a farmer may go through to consider segregating higher protein wheat. The first column represents the average return for ordinary wheat storage. Average returns for high protein are represented in the second column. The first two columns are summed to find a total return for storing 13 percent wheat.

Table 20. Estimated Returns and Costs for Storage of High Protein Wheat in Colorado for Eleven Year Average Prices.

	Returns ($/bu.)				
Month	Storage	Protein	Ttl	Storage[1] Costs	Return to Storage
July	0	.177	.177	.17	.01
August	.19	.148	.338	.21	.13
September	.26	.155	.415	.25	.16
October	.33	.155	.485	.29	.20
November	.33	.159	.489	.33	.16
December	.38	.164	.544	.37	.17
January	.38	.154	.534	.41	.12
February	.35	.139	.489	.45	.04
March	.26	.148	.408	.49	(.08)
April	.16	.166	.326	.53	(.20)
May	.02	.154	.174	.57	(.40)
June	.13	.189	.389	.61	(.29)

[1] Cost of storage and interest for a small (7,000 bushel) bin.

High protein wheat must be stored. Few elevators will accept it for a premium at harvest time. The sheer volume of wheat coming in to the elevator at harvest makes segregation difficult for the elevator manager. A smaller, on-farm, storage facility is needed for 13 percent and above wheat. The volume of it any one farmer harvests at a time is usually small enough that larger facility would be used inefficiently. Storage costs for a 7,000 bushel bin are shown in the fourth column of Table 20.

Overall profit for storing high protein wheat is shown in the last column. It is apparent from the table that October would be the profitable time to market the wheat. This, however, can vary greatly from year to year. Traditionally, corn could be coming into the local elevator in October and again, make segregation of high protein wheat uneconomical for the elevator manager. In general, marketing of this kind of wheat involves a great deal of cooperation from the market and the local marketing outlet.

Feeding Wheat

At times, wheat prices can be attractive to the cattle feeders and a major shift of wheat to livestock feeding can occur. The primary use of wheat for livestock feed is by cattle in feedlot operations. As an example of the potential importance of livestock feeding, during the market year of 1971 livestock consumed 31 percent of the wheat produced in Colorado. In 1980 and 1981 feeding accounted for only about .6 percent of the total utilization of Colorado wheat.

Wheat is a good feed for cattle. Wheat energy values are only slightly below those of corn, but wheat protein averages about 3.5 percent greater than corn. Therefore, wheat fed in a beef ration can replace both a part of the concentrate and a portion of the protein supplement. In wheat feeding trials in Kansas, the relative value of wheat depended upon the proportion of wheat in the ration. Their recommendation is to limit wheat to 50 percent of the ration. Similar results have been obtained by Matsushima and Truax in Colorado.

The Kansas results indicate that a pound of wheat will replace 1.17 pounds of concentrate such as corn. Or, if protein is to remain constant, a pound of wheat will replace 1.04 pounds of corn and 0.13 pounds of 41 percent protein supplement, such as cottonseed meal. A bushel of wheat will replace 1.11 bushels of corn and 7.8 pounds of cottonseed meal. Grain sorghum has lower energy so that one bushel of wheat will replace 66.3 pounds of sorghum and 8.1 pounds of cottonseed meal. For various prices of grain and protein, an equivalent feeding price for wheat is derived. These equivalent wheat feeding prices are shown in Table 21.

If the price of wheat falls below its feeding value, wheat is gradually introduced into rations. As the divergence between feeding value and price widens, even greater wheat feeding occurs. During 1969 and 1970, feeders were uncertain as to the feasibility of wheat feeding. Feeding of wheat increased in 1971 and 1972. With the improvement of wheat prices in the mid-70s, for the most part, wheat was phased out of feeding rations.

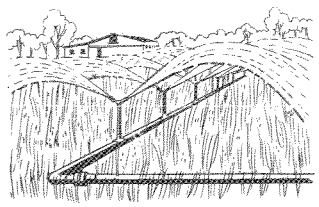


Table 21. Relative Values of Wheat Grain for Beef Cattle Feeding with 50 Percent Wheat in Ration and Varying Corn, Sorghum and Protein Prices.

Concentrate price/bu.	Price of 41 Percent Protein Supplement in $/Ton				
	$100	$150	$200	$250	$300
Corn					
$1.50	2.06	2.26	2.45	2.65	2.84
$2.00	2.62	2.81	3.01	3.20	3.40
$2.50	3.18	3.37	3.57	3.76	3.95
$3.00	3.73	3.93	4.12	4.32	4.51
$3.50	4.29	4.48	4.68	4.87	5.07
Grain Sorghum					
$1.50	2.18	2.38	2.59	2.79	2.99
$2.00	2.77	2.98	3.18	3.38	3.58
$2.50	3.37	3.57	3.77	3.97	4.18
$3.00	3.96	4.16	4.36	4.57	4.77
$3.50	4.55	4.75	4.95	5.16	5.36

Source: Adapted from Feeding Wheat to Beef Cattle.

SUMMARY

Marketing presents a major challenge to wheat producers in Colorado. Meeting this challenge requires the development of a sound marketing program requiring a knowledge of production costs, the risks and returns associated with various marketing alternatives, and up-to-date market information. However, these three ingredients do not guarantee successful marketing. It is the individual producer's ability to analyze this information and make the decisions balancing risks and returns which will determine the success of a personal marketing program.

The information about marketing alternatives presented in this bulletin is intended to help producers sharpen their marketing skills in order to better meet the challenges of wheat marketing.