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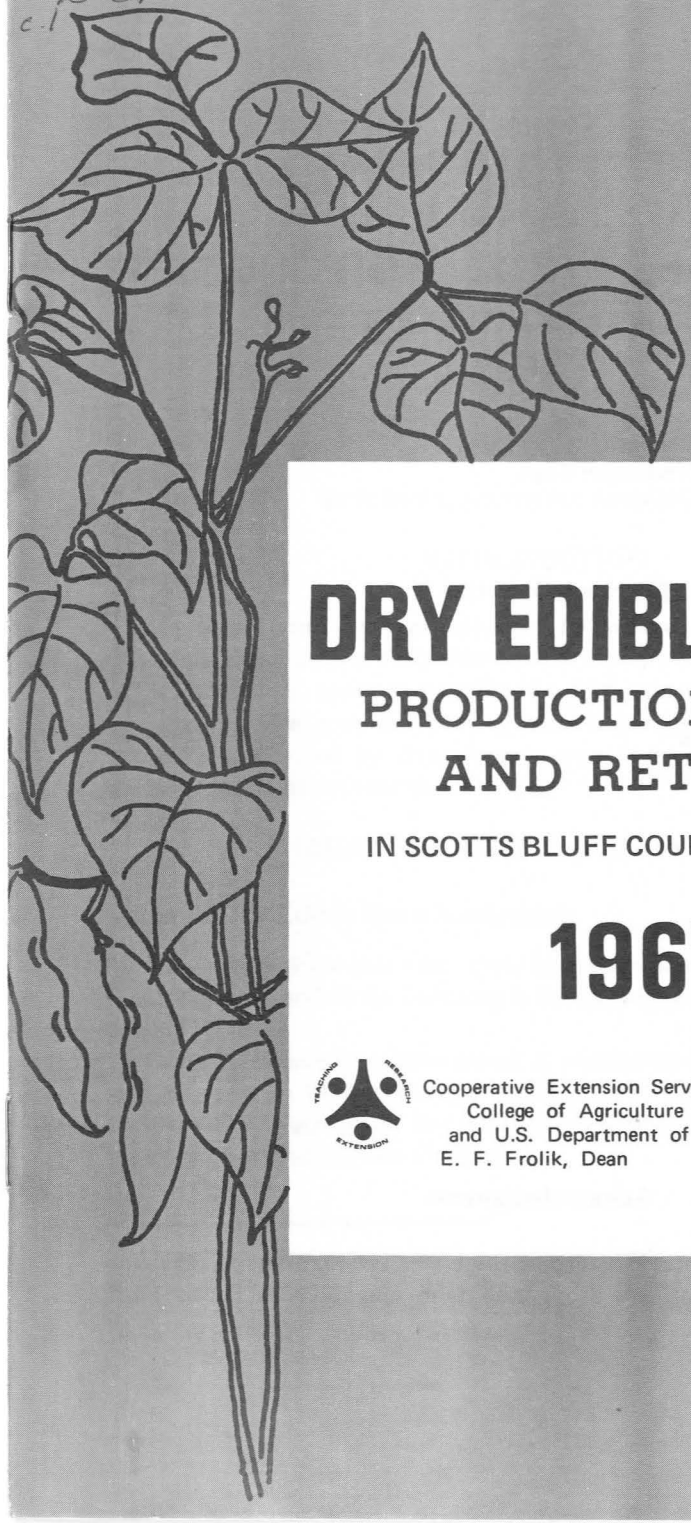

DRY EDIBLE BEAN

PRODUCTION COSTS AND RETURNS

IN SCOTTS BLUFF COUNTY, NEBRASKA

1967

Cooperative Extension Service, University of Nebraska
College of Agriculture and Home Economics,
and U.S. Department of Agriculture Cooperating
E. F. Frolik, Dean J. L. Adams, Director

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Acknowledgments

The cooperation of three outstanding dry edible bean growers in providing cost and production input data from their farm operations in Scotts Bluff County is appreciated.

DRY EDIBLE BEAN

PRODUCTION COSTS and RETURNS

IN SCOTTS BLUFF COUNTY, NEBRASKA

1967

By Clifford L. Ashburn and James D. Greer[1/]

INTRODUCTION

Dry edible beans are a specialty crop in Nebraska. Profitable production of dry edible beans requires a high level of technical expertise. Information on costs of production is essential to plan for high returns to capital, labor and management. The costs and returns data in this bulletin are estimated from information provided by three farmers who have been producing dry edible beans for excellent net returns.

CHARACTERISTICS OF THE INDUSTRY

Value of Dry Edible Bean Production

Two major dry edible bean varieties are produced in Nebraska. They are Great Northern and Pinto. Nebraska is the leading producer of Great Northern beans.

Dry edible beans have been grown as a cash crop in western Nebraska for at least 50 years. In 1919, there were 2,000 acres harvested with a reported value of $51,000. The acreage of dry edible beans harvested in 1967 was 69,000 and the value of production was $9,825,000.

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Table 1. Dry edible bean acreage, yield, production and value by counties, Nebraska, 1967.

County	Acres planted	Acres harvested	Yield per harvested acre	Production	Value of production
	Acres	*Acres*	*Cwt. per Acre*	*Cwt.*	*Dollars*
Banner	50	50	16.0	800	6,000
Box Butte	7,300	7,170	17.6	126,020	957,750
Cheyenne	640	620	16.1	9,980	78,840
Dawes	30	30	20.0	600	4,500
Deuel	960	940	17.2	16,160	126,050
Garden	20	20	16.5	330	2,740
Kimball	1,260	1,240	19.4	24,110	195,290
Morrill	11,690	11,230	18.7	210,500	1,599,800
Scotts Bluff	41,460	40,810	18.7	761,490	5,882,130
Sheridan	2,620	2,460	17.3	42,610	332,360
Sioux	3,140	2,830	20.5	58,080	441,410
Custer	340	310	13.4	4,160	32,860
Valley	30	30	18.0	540	4,050
Chase	200	180	16.0	2,880	22,750
Keith	1,080	940	16.5	15,500	120,900
Lincoln	20	20	16.0	320	2,400
Perkins	160	120	16.0	1,920	15,170
Nebraska	71,000	69,000	18.5	1,276,000	9,825,000

Source: State-Federal Division of Agricultural Statistics.

In recent years, Pinto bean acreage has been increasing relative to the acreage of Great Northern beans. This trend has been due partly to price differentials and partly to production starting in new areas. In these new areas, Pinto beans are easier to process; they do not have to be graded and sorted by an electric eye.

The Nebraska dry edible bean crop is grown under irrigation, with few exceptions. The climate of western Nebraska is favorable to production of both Great Northern and Pinto varieties.

Dry edible beans are produced in 17 Nebraska counties. Scotts Bluff County produces more than half of the dry edible beans in Nebraska. In 1967, the acreage planted in Scotts Bluff County was 41,460, the harvested acres 40,810 and the average yield 18.7 hundredweight per acre. Other counties with large acreages of dry edible beans are Morrill, Box Butte and Sioux (Table 1).

Local Marketing of Dry Edible Beans

Nebraska growers sell dry edible beans to beaneries within their local areas. The beaneries process and package the beans. The packaged beans are shipped and sold throughout the United States and in many foreign markets.

Table 2. Average prices received for dry edible beans in selected calendar years, Nebraska, 1919–1968.

Year	Price
	Dollars per hundredweight
1919	8.50
1920	6.70
1930	4.95
1940	2.65
1950	6.40
1955	6.00
1956	6.00
1957	7.30
1958	6.30
1959	6.00
1960	6.80
1961	6.20
1962	4.60
1963	6.20
1964	7.00
1965	7.80
1966	6.20
1967	6.80
1968	7.44

Source: State-Federal Division of Agricultural Statistics.

Growers can either sell their beans at harvest time or put the beans in storage for later marketing. If beans are placed in warehouse storage, variable costs will be incurred. Growers storing beans on their farms have fixed costs on storage facilities plus variable costs.

The variable costs for commercial storage include the storage charge, interest on the value of beans, insurance on beans, shrinkage and broken beans. Most of these costs increase with the period of time that beans are stored. If storage from harvest time is to be profitable, the price must increase enough to cover the storage costs per hundredweight of beans.

Prices that farmers have received for dry edible beans have varied widely over the years. During the last 10 calendar years, the lowest average price was $4.60 per hundredweight in 1962; the highest average price was $7.80 in 1965 (Table 2).

Seasonal price fluctuations have not shown consistent trends in recent years (Figure 1). For the 1967 marketing year starting in September, price rose from $7.50 per hundred pounds to $7.80 in March. For the last 6 months of the 1967 marketing year, bean prices remained stable at $7.80 per hundred pounds.

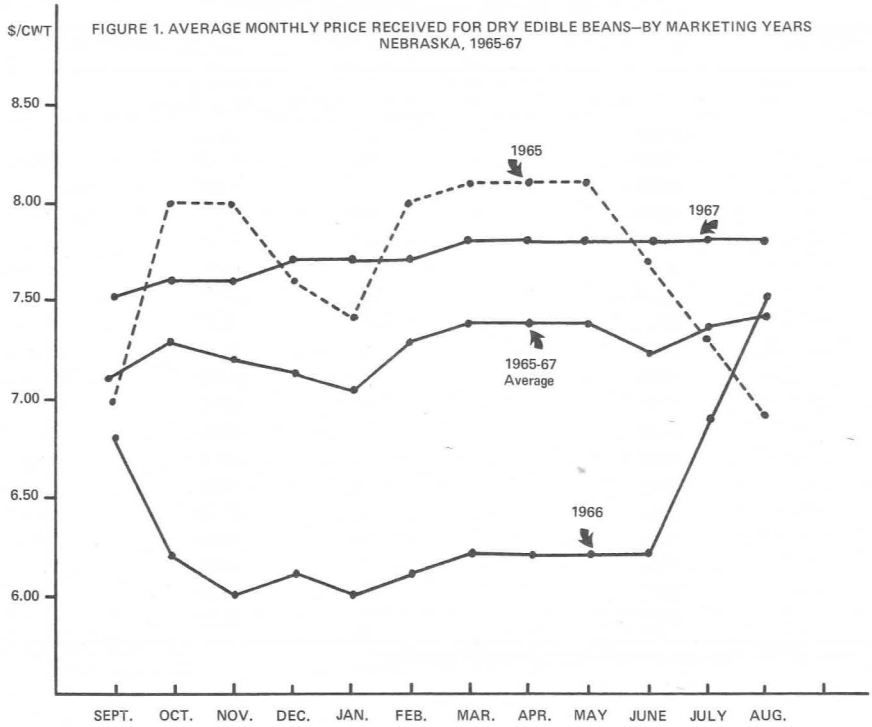

FIGURE 1. AVERAGE MONTHLY PRICE RECEIVED FOR DRY EDIBLE BEANS—BY MARKETING YEARS NEBRASKA, 1965-67

Source: State-Federal Division of Agricultural Statistics

During the 1966 marketing year, the price of $6.80 per hundred pounds in September broke to $6.00 by November. Price regained some stability at $6.20 per hundred pounds by March. The price in June at $6.20 per hundred pounds increased sharply to $7.50 in August. The seasonal price movement for the 1966 marketing year was unusual. The large drop in price from September to November was not typical of the normal movement. The large increase in price just before the 1967 harvest was not typical; prices of dry edible beans are usually expected to fall just before harvest.

During the 1965 marketing year the price per hundred pounds was $7.00 in September and $8.00 by October. Price declined from $8.00 per hundred pounds in November to $7.40 by January. Price reached a high of $8.10 per hundred pounds during March and held through May. From May to August, the price dropped $1.20 per hundred pounds to $6.90. The swings in price during the 1965 marketing years were rather large.

Table 3. Government support price for dry edible beans, by variety and grade, Nebraska, 1967.

Variety	Grade	Support price[a]
		Dollars per hundredweight
Pinto	1's	6.47
	2's	6.22
Great Northern	1's	7.21
	2's	6.96

[a] The charge per hundredweight for cleaning, bagging and storage to April 30 is approximately $1.25.

Source: ASCS Office—Scotts Bluff County, Nebraska.

Government Program Provisions

Support Price— Dry edible beans are eligible for government support prices. There are no acreage controls on dry edible beans. The support price for Great Northern beans is higher than for Pinto beans (Table 3). When price supports are favorable, the acreage of both Great Northern and Pinto beans usually increases.

Support Loan—To obtain a Commodity Credit Corporation loan on dry edible beans, the grower must first deliver his crop at harvest to a beanery for storage. The beanery issues a warehouse receipt to the grower. This receipt states the quantity and grade of beans. The grower takes the warehouse receipt to the county ASCS office where the loan is made. The receipt is filed at the ASCS office.

The normal charge for cleaning, bagging and storage is $1.25 per hundred pounds of beans to April 30 payable at the beanery in advance. (The storage charge is one cent per hundred pounds per 10 days in storage or three cents per hundred pounds per month.)

The grower pays interest on the loan at a rate of $0.30 per $100 per month, not counting the month in which the loan is taken. The service fee to obtain a loan is $2.

The grower receives the support price for the beans less the charge by the beanery for processing and storage.

The deadline on the loan is April 30 following harvest. If the beans are not sold by April 30th, the grower has three options:

Option 1. The grower asks that ownership of the beans transfer to the Commodity Credit Corporation on April 30. The grower pays the charge for cleaning, bagging and storage. He receives the support price.

Option 2. The grower files for an extension of the loan before April 30 if extensions are offered. The extension specifies the number of days that the beans may be stored. At the end of the loan extension, the grower may repay the loan by transferring ownership to the Commodity Credit Corporation or by direct payment of the loan.

Option 3. The grower repays the loan plus interest at the ASCS office before April 30 or the end of his loan extension and then markets his beans directly to the beanery. The grower receives the market price for the beans. He does not pay the cleaning and bagging charges to the beanery but he does pay the storage charge. The beanery refunds all prepaid charges for cleaning, bagging and unused storage.

Dry edible beans stored on the farm in buildings of excellent condition are eligible for support loans under the Commodity Credit Corporation program. The loan rate is $1 less per hundredweight for farm stored beans than for the warehouse storage loan. The loan on farm stored beans is made based on 90% of the measured quantity in storage.

Few growers have Commodity Credit Corporation loans on farm stored beans. In Scotts Bluff County, only 2 to 5 growers have CCC loans each year on farm stored beans. About 125 to 175 growers obtain CCC loans on warehouse stored beans each year.

In 1964, there were about 900 growers of dry edible beans in Scotts Bluff County. About 15 to 20% of the growers obtain CCC loans each year.

Production of Dry Edible Beans

Profitable production of dry edible beans requires intensive management. The grower needs to shoot for top yields and control over costs.

Several production practices appear most important for top yields in western Nebraska:

1. Planting disease free seed.
2. Planting within the proper time period.
3. Planting on fertile, well-drained soil.
4. Controlling weeds.
5. Controlling insects and diseases.
6. Irrigating in timely intervals.
7. Harvesting efficiently at proper moisture levels.

Although this list does not include all management factors associated with profitable production of dry edible beans, these production practices distinguish producers of top yields from producers of average yields.

Many growers may be able to reduce production costs without reduction in yield. The greatest economies in production costs are likely to be in the following areas:

1. Number of machinery operations. Growers commonly perform from 10 to 12 machinery operations from the start of seedbed preparation through harvesting and roughening the soil. Many growers could eliminate several operations in seedbed preparation and cultivation without any reduction in yield. Good results can be obtained by plowing and packing in one operation

and planting without any other preparation. This would lower machine, fuel and labor costs.

2. Quantity of fertilizer applied. Dry edible beans are a legume and do not require large amounts of fertilizer if grown on soils with adequate fertility.

3. Harvesting costs. Harvesting equipment is the most expensive machinery item. A grower with a small acreage of beans should compare the costs of owning and operating a machine with the costs of custom operation. A grower might do custom work for others and reduce machinery costs per acre. Cutting and windrowing beans in a single operation rather than separate operations could reduce power costs and field loss.

PROCEDURE FOR ESTIMATING PRODUCTION COSTS

Information on the costs of producing dry edible beans in Nebraska has been lacking. This study, on a case basis, attempts to fill this void.

The costs of dry edible bean production were estimated from information provided by three growers in Scotts Bluff County. (For estimates of the average cost of dry edible bean production for 68 growers in Wyoming, see Appendix Table 3.)

The estimated return to management and risk per acre are sufficiently high for these three growers that they are considered outstanding managers in the production of dry edible beans. The average yield of the three growers during 1965, 1966 and 1967 was 25.4 hundredweight per acre. Consequently, the returns for these growers are above the average of most growers in Nebraska or in Scotts Bluff County. The average yield in Scotts Bluff County during 1965, 1966 and 1967 was 18.5 hundredweight per acre.

Machinery, Power, and Trucking Costs

The annual fixed costs of owning machinery include depreciation, interest on investment, taxes, insurance and shelter for the machinery. The annual fixed costs were estimated for each machine. The machinery fixed costs were allocated to the dry edible bean enterprise on the basis of the amount of use on dry edible beans relative to the total use of each machine in all crop (and livestock) enterprises.

The variable costs of operating a machine include lubrication, fuel, repairs and labor. If a machine was rented or an operation was custom hired, the charge for this service was included in variable costs.

Fixed Costs—The procedure for estimating each item under annual fixed costs on each machine, tractor and truck was:

1. Depreciation. The grower provided the purchase price of each machine, the estimated number of years he expected to use the machine, and the

estimated trade-in allowance for the machine when he expected to trade for another machine. Annual depreciation was estimated to be the difference between purchase price and trade-in allowance divided by the estimated years of use.

2. *Interest on investment.* The interest rate charged for the investment in machinery was 6%. This rate is the assumed earnings from alternative non-farm investments. The average annual investment was half the sum of the purchase price and trade-in allowance. The average annual interest on investment was 6% times the average annual investment.

3. *Property taxes.* Average annual taxes were estimated by multiplying the mill rate by 35% of the average annual investment.

4. *Insurance.* The estimated cost of insurance was $0.35 per $100 face value of insured coverage.

5. *Shelter.* Annual housing costs for machinery were estimated at the rate of 10.5 cents per square foot of machinery space required.

Total annual fixed costs for any machine equals the sum of the above five items (depreciation, interest on investment, taxes, insurance and shelter).

The total amount of annual use for each machine was estimated by each of the growers. For tractors, annual use was estimated in hours. For trucks, it was estimated in tons of sugar beets, beans, grain, forage and feed hauled. For all other machinery, the amount of annual use was estimated in acres.

Annual fixed machinery costs were allocated to dry edible beans on the basis of use in the bean enterprise relative to total annual use in all enterprises. The fixed costs per acre for a tractor equal the total fixed costs per hour in all uses times the tractor hours per acre of dry edible beans. The fixed costs per acre of a truck equal the total fixed costs per ton of all commodities hauled times the tons of dry edible beans harvested per acre. For all machines other than tractors and trucks, the fixed costs per acre equal the annual fixed costs divided by the total acres of annual use.

Variable Costs—The procedure for estimating variable costs (see example in Appendix Table 2) for each machine was:

1. *Lubrication.* The lubrication costs for tractors were estimated at a rate of $0.10 per hour for small tractors up to a rate of $0.16 per hour for large tractors. For the other machines used in production of dry edible beans, lubrication costs were estimated to be $0.01 per acre up to $0.05 per acre. The higher estimates were for the larger machines with greater mechanical complexity.

2. *Repairs.* Each grower was asked to estimate average annual expenditures for repairs on each machine. For those machines where knowledge of repair expenditures was lacking, estimates were based on the rate of annual use relative to its purchase price and its mechanical complexity.

3. *Fuel.* Each grower estimated the rate of fuel consumption for each

machinery operation. The net price for gasoline (excluding federal and state gasoline taxes) was estimated at $0.18 per gallon. The price of diesel fuel was estimated at $0.15 per gallon.

4. Labor. Each grower estimated the time required per acre for performing each machinery operation. The hours of labor per acre times the wage rate (on an hourly basis) equals the labor cost per acre for each operation.

Operator labor was charged at a rate of $2.50 per hour. This wage was considered a reasonable wage which could be earned by these operators in readily available alternative occupations. This estimated wage rate does not imply, nor attempt to include, the cost of management for these operators.

Hired labor costs were estimated at the rate of $1.50 per hour.

Labor Costs Other Than Machinery Operation

The time required for servicing and adjusting equipment, irrigating, burning weeds in irrigation canals and laterals, opening fields for harvest, delivering production inputs to the farm, and supervising contract labor was charged as a labor cost. The cost of operator labor was charged at $2.50 per hour. Hired labor costs were estimated at $1.50 per hour.

The three growers indicated they used contract labor to weed dry edible beans in about 5 out of 10 years. The contract labor cost is the average expenditure per year for 10 years.

Chemicals—The fertilizer cost was the actual expenditure for fertilizer in 1967. The costs per acre for herbicides and insecticides were the average annual expenditures for these items during the five-year period, 1963-1967.

Seed—The seed cost was the actual expenditure in 1967.

Irrigation—Farms of these Scotts Bluff County growers are in the Irrigation District. The price for irrigation water is determined by the district. In addition to this water charge, the estimated annual costs of a lateral ditcher, dams and siphon tubes were included.

If dry edible beans are irrigated from deep wells, the irrigation costs are usually higher than irrigation costs of these three growers. Pump irrigation costs depend upon the pumping depth, rate of flow, type of power used and the fixed costs of well, pump, motor and distribution system. To estimate these costs, see Extension Circular 64-733, University of Nebraska, "Pump Irrigation Cost Analysis."

Land—The cost charged for land was 6% of the estimated market value per acre. The real estate taxes were the actual amount paid in 1967.

Miscellaneous—Included in this category are costs for the pickup truck and interest on cash operating expenses. Interest on cash operating expenses was

Table 4. Estimated costs per acre (excluding management costs) of dry edible bean production for three growers, Scotts Bluff County, 1967.

Cost Item	Grower 1		Grower 2		Grower 3		Average of costs per acre
	Dollars/Acre		*Dollars/Acre*		*Dollars/Acre*		*Dollars/Acre*
1. Machinery, power and trucking costs (excluding labor)							
a. Preplant	9.03		5.92		11.52		8.82
b. Planting	2.15		2.56		5.35[b]		3.35
c. Tillage	3.09		2.90		4.29		3.43
d. Harvesting and Hauling	6.22		18.71[a]		13.72[a]		12.88
e. Stack Straw	.44		1.31		4.40		2.05
f. Spray Equipment	–0–		.95		–0–		.32
Subtotal		20.93		32.35		39.28	30.85
2. Irrigation		6.50		3.83		6.50	5.61
3. Fertilizer		4.00		–0–		–0–	1.33
4. Insecticide		–0–		–0–		2.00	.67
5. Herbicide		3.00		3.00		3.00	3.00
6. Seed		8.00		8.94		7.50	8.15
7. Labor							
a. Contract		2.00		5.00		5.00	4.00
b. Hired	(1.78 hrs.)	2.68		–0–		–0–	(.59 hrs.) .89
c. Operator	(8.59 hrs.)	21.47	(8.93 hrs.)	22.32	(11.24 hrs.)	28.10	(9.59 hrs.) 23.96
8. Land							
a. Interest		39.00		36.00		42.00	39.00
b. Taxes		6.50		6.76		6.50	6.59
9. Miscellaneous		2.51		6.42		2.37	3.77
10. Storage		–0–		6.48		4.56	3.68
Total costs per acre (excluding management)		$116.59		$131.10		$146.81	$131.50
Total costs per hundredweight of beans		4.86		4.86		5.83	5.18
Acres of beans		35		35		20	30
Yield (hundredweight per acre)		24.0		27.0		25.2	25.4

[a] Custom hired.

[b] Herbicide incorporated with planting.

estimated at a rate of 7% for a period of 6 months.

COSTS OF PRODUCTION

Total costs per acre (excluding management costs) for producing dry edible beans ranged from $116.59 per acre to $146.81 per acre. The average cost per acre for the three growers was $131.50 per acre (Table 4). (For a detailed listing of costs by item, see Appendix Table 1.)

The big differences in total costs per acre among the three growers are due to:

1. Machinery systems, particularly harvesting machinery.
2. Amount of labor used.

The operator and hired labor used in machinery operation ranged from 4.08 hours per acre to 7.14 hours per acre (Table 5). Total labor use ranged from 8.93 hours per acre to 11.24 hours per acre.

Costs of dry edible bean production for these three growers averaged $131.50 per acre. The average cost of production for all growers of dry edible beans in Scotts Bluff County is estimated to be between $110 and $120 per acre. The primary reason for a lower average cost of production for all growers is that land costs are less.

The estimated market value of land for the costs budgeted of three growers averaged $650 per acre. Interest at 6% equalled $39 per acre and real estate taxes averaged $6.59 per acre. The total land cost averaged $45.59 per acre.

The average value of all irrigated land in the county is estimated at $400 per acre. Interest at 6% is $24 per acre, and taxes are estimated at $4 per acre. The average land cost for all irrigated land in the county is estimated at $28 per acre. This is $17.59 per acre less than the average land cost of these three growers. Offsetting the lower land cost for all growers are machinery costs—anticipated to average higher.

Table 5. Estimated labor use per acre in dry edible bean production for three growers in Scotts Bluff County, Nebraska, 1967.

Task	Grower 1	Grower 2	Grower 3	Average
	Hours per acre			
Machinery operation	7.14	4.08	6.82	6.01
Irrigation	1.50	2.50	1.50	1.83
Equipment adjustment	1.37	1.97	2.50	1.95
Miscellaneous	.36	.38	.42	.39
Total labor use	10.37	8.93	11.24	10.18

Table 6. Estimated average costs and returns per acre from dry edible bean production for three growers and for all growers in Scotts Bluff County, Nebraska, 1967.

	Average of three growers	Estimated county average
Yield (cwt./acre)	25.40	18.60
Price (dollars/cwt.)	7.72	7.72
Value of bean straw (dollars/acre)	3.00	3.00
Gross Returns	*Dollars/acre*	*Dollars/acre*
Beans	196.09	143.59
Straw	3.00	3.00
Total	199.09	146.59
Costs of Production		
1. Total production costs	131.50	112.40[a]
2. Variable costs, including operator labor	69.05	67.54
3. Variable costs excluding operator labor	45.09	43.58
Net Returns		
1. to management	67.59	34.19
2. to management and operator labor	91.55	58.15
3. to management, operator labor and capital	143.64	92.65
Returns over variable costs including operator labor	130.04	79.05
Returns over variable costs, excluding operator labor	154.00	103.01

[a] Based on budgeted costs of three growers except interest on land plus real estate taxes equal $28 per acre and harvesting cost equals $9.30 per acre.

NET RETURNS

The yields of these three growers averaged 25.4 hundredweight per acre in 1967. The average county yield in 1967 was 18.6 hundredweight per acre. The average price in the 1967 marketing year was $7.72 per hundredweight. The gross return per acre from dry edible bean production averaged $199.09 for these three growers and $146.59 for all growers (Table 6). The return per acre to management averaged $67.59 for these three growers and an estimated $34.19 for all growers. The return over variable costs averaged $130.04 for these three growers and an estimated $79.05 for all growers.

During the 4 years—1964-1967—production of dry edible beans in Scotts Bluff County is estimated to have been most profitable in 1967 (Table 7). The lowest average gross return per acre was $112.03 in 1964. The highest average gross return per acre was $146.59 per acre in 1967. The estimated production costs for 1964, 1965 and 1966 are the production costs for 1967 adjusted for harvesting costs. Harvesting and hauling costs were estimated at a rate of $0.50 per hundredweight. The estimated return to management was lowest at $1.23 per acre in 1964. The estimated return to management was highest at $34.19 per acre in 1967.

Table 7. Estimated average costs and returns per acre from dry edible bean production in Scotts Bluff County, Nebraska, 1964, 1965, 1966 and 1967.

	1964	1965	1966	1967
Yield (cwt./acre)	15.4	15.9	21.0	18.6
Price (dollars/cwt.)	7.08	7.68	6.37	7.72
Value of bean straw (dollars/acre)	3.00	3.00	3.00	3.00
	Dollars/acre			
Gross Returns				
Beans	109.03	122.11	313.77	143.59
Straw	3.00	3.00	3.00	3.00
Total	112.03	125.11	136.77	146.59
Costs of Production				
1. Total production costs[a]	110.80	111.05	113.60	112.40
2. Variable costs including operator labor[a]	65.94	66.19	68.74	67.54
3. Variable costs excluding operator labor[a]	41.98	42.23	44.78	43.58
Net returns				
Returns:				
1. to management	1.23	14.06	23.17	34.19
2. to management and operator labor	25.19	38.02	47.13	58.15
3. to management, operator labor and capital	59.69	72.52	81.63	92.65
Returns over variable costs including operator labor	46.09	58.92	68.03	79.05
Returns over variable costs excluding operator labor	70.05	82.88	91.99	103.01

[a] Harvesting and hauling cost estimated at a rate of 50¢ per hundredweight of beans.

BREAK-EVEN YIELDS

To estimate the yield which will recover costs of production per acre, divide estimated costs of production per acre by the price received per hundredweight. The result is the yield in hundredweight of beans per acre. For example:

The costs of production are known to be $120 per acre (see left column of Table 8). The expected price per hundredweight of beans is $7 (see column heading $7). The yield necessary to recover $120 of costs per acre at a price of $7 per hundredweight is 17.1 hundredweight per acre (read across the row of $120 to the column headed $7).

Table 8. Break-even yields at selected levels for costs of production and prices of dry edible beans.

Costs of production ($/acre)	Price ($/cwt.)			
	$6	$6.50	$7	$7.50
	cwt./acre			
$110	18.3	17.0	15.7	14.7
115	19.1	17.7	16.4	15.3
120	20.0	18.5	17.1	16.0
125	20.8	19.2	17.9	16.7
130	21.7	20.0	18.6	17.3
140	23.3	21.6	20.0	18.7
150	25.0	23.1	21.4	20.0

Appendix Table 1. Estimated costs of individual items budgeted in dry edible bean production for three growers, Scotts Bluff County, Nebraska, 1967.[a]

	Range	Average for 3 growers
	Dollars/acre	
Disk	1.03–2.02	1.53
Plow and pack	3.58–4.19	3.91
Packer-drag	1.59–3.06	2.49
Plant	3.03–6.60	4.26
Two cultivations	4.56–5.40	4.98
(Per cultivation)	(2.28–2.70)	(2.49)
Float	0–2.17	.72
Cut beans	1.52–1.91	1.67
Windrow beans	1.94–4.95	3.17
Combine and haul beans (Custom combine: 25¢/bu.) (Custom trucking: 5¢/bu.)	7.75–12.65	10.21
Stack straw	1.60–2.03	1.55
Chisel	1.05–2.49	1.77
Manure hauling	8.62–9.55	9.08
Irrigation:		
Water charge (from ditch)	3.50–5.00	4.50
Dams and tubes	.33–1.50	1.11
Labor (2–3 irrigations)	3.75–6.25	4.85
Hand weeding (contract labor)	2.00–5.00	4.00
Herbicides	3.00	3.00
Insecticides	0–2.00	.67
Seed	7.50–8.94	8.15
Pickup truck	1.00–2.25	1.42
Overhead labor for equipment adjustment	3.52–6.25	4.90
Interest on operating expenses	.81–1.49	1.26
Storage	4.56–6.48	5.52
Fertilizer	0–4.00	1.33
Replanting (30% of planting cost and seed cost)	.80–2.85	1.82
Weed spraying	0–1.25	.42
Interest on land	36.00–42.00	39.00
Real estate taxes	6.50–6.76	6.59

[a] All labor for machinery operations and irrigation are included at a rate of $2.50 per hour.

Appendix Table 2. Budgeting procedure for costs of a tractor and 3-bottom plow.

	Tractor diesel 60–69 drawbar horsepower	Plow 3-bottom
Annual use	700 hours	150 acres
Acres plowed per hour		1.8
Value	$6,555.00	$980.00
Salvage value	655.00	98.00
Depreciable balance	$5,899.50	$882.00
Years of depreciation	10	15
Annual fixed costs:		
Depreciation	$589.95	$58.80
Interest	216.32	32.34
Taxes	54.26	6.60
Insurance	12.62	1.89
Housing	10.00	4.72
Total	$883.15	$104.35
Variable costs:		
Fuel (4.4 gal./hr. @15¢/gal.)	$.66/hr.	...
Lubrication	.15/hr.	$.02/acre
Labor	2.50/hr.	...
Repairs	.42/hr.	.35/acre
Total	$3.73/hr.	$.37/acre
Fixed costs	$1.26/hr.	$.70/acre
Variable costs	3.73/hr.	.37/acre
Total costs	$4.99/hr.	$1.07/acre
Tractor cost per acre (1.8 acres/hr.)		$2.77/acre
Plow cost per acre		$1.07/acre
Cost per acre for plowing		$3.84/acre

Appendix Table 3. Average costs to produce one acre of dry edible beans, Wyoming, 1966 (68 growers in Big Horn Basin and Southwestern Wyoming, 1966).

Type of input	Estimated cost per acre
Yield expected per acre: 18.6 cwt.	
Pre-harvest cash costs	
Man hours	$14.08
Tractor hours	5.06
Machinery hours	2.53
Pick-up truck miles	.30
Real estate taxes	2.66
Material inputs	
Seed and treatment	7.42
Irrigation water	5.33
Barnyard manure	5.06
Commercial fertilizer	4.84
Chemical weed control	10.17
Total pre-harvest cash costs	$57.45
Harvest cash costs	
Man hours	$4.22
Tractor hours	1.90
Machinery hours	1.90
Truck miles	.71
Total cash harvest cost	$8.73
Total cash cost (pre-harvest and harvest)	$66.18
Miscellaneous cash costs[a]	$6.62
Non-cash costs	
Pre-harvest and harvest tractors, machinery and trucks	$13.03
Interest on land investment[b]	16.54
Total non-cash costs	$29.57
Total cash and non-cash cost	$102.37

[a] Includes 4% interest on cash costs and 6% on cash costs for farm overhead.

[b] Interest on land investment estimated at 5% interest on an average investment of $330 per acre.

Source: Delwin M. Stevens, "Costs and Returns for Irrigated Crops in Wyoming," Experiment Bulletin 467, University of Wyoming, Laramie, March, 1967, p. 26.