Economics of Grain-Fallow Rotations in Saskatchewan

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For a number of years the acreages of various crops in Saskatchewan
has not given farmers much scope for crop rotation in the sense that
sequences of different crops are grown in succession (Table 1). About
40% of the cropland has been sown to wheat, 20% to other crops, and 40%
has been summerfallowed. Many farmers follow a simple rotation of
alternating summerfallow and wheat or other cereal. This practice is common
even in areas where the risk of crop failure due to drought on stubble land
is very low. The quota system of marketing has encouraged farmers to
summerfallow a high percentage of their land in years when carryovers are
large.

The market outlook for 1973-74 and 1974-75 is very different from recent
years and farmers should consider cropping more of their stubble land in
1974. Although wheat acreages around the world will be large in 1974-75
the world carryovers at July 31, 1974 will be the lowest in many years, and
are considered dangerously low by some standards. Unless grain yields are
at least up to average in the major producing countries prices may remain
at or near their present historically high levels.

For farmers to switch from a half crop system to a two-thirds crop
system there are a number of farm management decisions to be made. In the
first place he should measure his soil moisture reserves to assess his
probability of growing a satisfactory stubble crop with normal summer
rainfall. He should have a soil test and be prepared to fertilize accordingly,
particularly on his stubble land. If his stubble land has heavy residues
remaining from 1973 it will require extra tillage to prepare a seedbed and
incorporate pre-emergence herbicides.

Before spring arrives he should decide whether stubble cropping will
pay, at what might be considered likely yields and prices. Following is an
example of how this can be calculated for a six-quarter section farm in
central Saskatchewan. Table 2 shows an estimate of the cash operating costs
for fuel, repairs, lubrication, etc., and the overhead (interest, depreciation)
costs of typical farm implements commonly found on a 900-acre grain farm.

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[*] Presented by H.M. Austenson

Table 1. Crop and summerfallow acreages in Saskatchewan

| Crop | 1962-71 | | 1973 | |
	Acres	% of total	Acres	% of total
Wheat	16,859,600	39.5	16,200,000	37.0
Oats[1]	2,404,400	5.6	2,400,000	5.5
Barley	2,539,500	5.9	4,300,000	9.8
Rye	384,660	0.9	260,000	0.6
Flaxseed	624,000	1.5	650,000	1.5
Mixed grains	138,800	0.3	210,000	0.5
Buckwheat	12,533[2]	-	3,500	-
Peas, dry	2,500	-	6,500	-
Rapeseed	901,400	2.1	1,450,000	3.3
Potatoes	8,380	-	3,000	-
Tame hay	1,240,900	2.9	1,900,000	4.3
Summerfallow	17,585,000	41.2	16,400,000	37.5
Total	42,701,673		43,783,000	

[1] Includes oats for grain and hay

[2] Broken period average

Source: Statistics Canada, Cat. No. 22-002. Preliminary estimates of crop
          and summerfallow acreages, Canada 1973. Field Crop Reporting
          Series No. 13. July 27, 1973.

Table 2. Estimated machinery operating and overhead costs at mid-1973
          prices.

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costs of typical farm implements commonly found on a 900-acre grain farm.

Table 3 lists the operations needed to grow a crop on summerfallowed land, together with their cash operating costs. Table 4 lists the operations typically used to grow a second crop. Table 5 lists a set of summerfallow operations. Each of these uses the cash costs associated with the type of machinery found in Table 2. A blank column is provided in each of these tables in which a farmer can insert his own estimate of his costs.

The information from these tables is used to fill in the costs of (1) a "one-half crop" system (Table 6) and (2) a "two-thirds crop" system (Table 7). These in turn can be used to fill in Table 8 which compares the net position from each of the two alternatives under various wheat prices.

Table 3. Estimated cash cost of producing wheat on summerfallow.

Operation	Example Estimate	Farmer's Estimate
	$ per acre	
Seeding with Discer		
- seed, 1.25 bus. @$6.00	$7.50	
- 40 lbs. of 11-55-0 @6¢	2.40	
- Discer operation	.44	
Preemergent wild oat control on 75% of acreage		
- chemical 1.25 lbs. @$3.60=4.50)		
- sprayer operation .11) x .75 =	3.60	
- harrow twice .20)		
24D Application		
- sprayer	.11	
- 24D 8 oz @6.1¢	.49	
Swath	.30	
Combine	1.78	
Haul to bin	.50	
Haul to elevator	1.50	
TOTAL	18.62	

Table 4. Estimated cash cost per acre of producing wheat on stubble

Operation	Example Estimate	Farmer's Estimate
	$ per acre	
Seeding with discer		
Seed, 1 bus. @6.00	6.00	_____
80 lbs. of 23-23-0 @5.3¢	4.24	_____
Discer operation	.44	_____
Preemergent wild oat control similar to Table 3	3.60	_____
24D Application		
Similar to Table 3	.60	_____
Swath	.30	_____
Combine	1.78	_____
Haul to bin	.50	_____
Haul to elevator	1.25	_____
Fall tillage (cultivator)	.42	_____
TOTAL	19.13	_____

Table 5. Estimated cash cost per acre for summerfallow tillage

Operation	Estimated Cost	Farmer's Estimate
Discer	.44	_____
2 Cultivations	.84	_____
2 Harrowings	.20	_____
2 Rod weedings	.48	_____
TOTAL	1.96	_____

Table 6. Total cost on 900 acres with one-half crop.

	Example	Farmer's Estimate
Operating costs		
- 450 acres summerfallow crop @$18.63	$8,379	_____
- 450 acres summerfallowing @$1.96	882	_____
Total operating costs	9,261	_____
Overhead Costs		
- Machinery Investment & Depreciation	4,714	_____
- Land ownership cost (960 x $80 x 7%)	5,376	_____
- Labor	6,000	_____
- Buildings and general overhead	2,000	_____
- Taxes @$250 per quarter section	1,500	_____
Total Overhead costs	19,590	_____
TOTAL COST	$28,851	_____

Table 7. Total cost on 900 acres with two-thirds crop.

	Example	Farmer's Estimate
Operating costs		
- 300 acres summerfallow crop @$18.62	$5,586	_____
- 300 acres stubble crop @$19.13	5,739	_____
- 300 acres summerfallowing @$1.96	588	_____
Total Operating costs	11,913	_____
Overhead Costs		
- Machinery investment & Depreciation	4,714	_____
- Land ownership cost (960 x $80 x 7%)	5,376	_____
- Labor	6,000	_____
- Buildings and general overhead	2,000	_____
- Taxes @$250 per quarter section	1,500	_____
Total overhead costs	19,590	_____
TOTAL COST	$31,503	_____

Table 8. Calculation of Net Returns

Net returns = (Yield per acre x acres x price) - Total costs

The following shows estimated net returns with three possible prices i.e., $5.00, $3.50 and $2.00 per bushel.

For one-half crop

				Net Returns
27 bushels (summerfallow yield) x 450 acres x $5.00 =	$60,750 -	$28,851 =	$31,899
(12150 bushels) x $3.50 =	42,525 -	28,851 =	13,674
x $2.00 =	24,300 -	28,851 =	-4,551*

For Two-thirds crop

27 bushels (summerfallow yield) x 300 acres$^+$
19 bushels (stubble yield) x 300 acres

X $5.00 =	69,000 -	31,503 =	37,497
(13800 bushels) X 3.50 =	48,300 -	31,503 =	16,797
X 2.00 =	27,600 -	31,503 =	-3,903*

Farmer's Estimate

_____ bushels x _____ Acres x $ _____ per bushel

_____ (Gross Return)   _____ Total Costs

_____ Net Return

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* Net losses are incurred because Total Costs include $6,000 for labor, $5,376 for land ownership costs and $4,714 for interest and depreciation costs on machinery. When grain prices are low all of these costs may not be covered.

In the above example assumptions were made for all cash and overhead costs. A farmer should substitute his own estimates of these costs and try a number of budgets based on different possible yields and prices. With this information he can make a judgement of the practices which will lead to the best outcome for his farm.

The wheat yields used in the above example are approximately the 1968-71 average yields on summerfallow and stubble reported by Statistics Canada for Crop District 6. With these yields the "Two-Thirds Crop" system gave a greater net return at all three projected wheat prices; $2.00, $3.50 and $5.00 per bushel. Net returns of the "Half Crop" and "Two-Thirds Crop" systems would be equal at $1.80 per bushel, and below that the "Half-Crop" system would give greater returns (lower losses).

Relative returns from rotations with other grains may be calculated by substituting appropriate operating costs, expected yields and prices.

DISCUSSION OF THE PAPER BY G.G. STOREY, G.E. LEE, AND HERMAN AUSTENSON ENTITLED: "ECONOMICS OF GRAIN-FALLOW ROTATIONS IN SASKATCHEWAN"

Comment: There is a comment I would like to make about your figures, Herman, it has to do with the seed cost. Normally when you are selling grain at $2.00/bushel you are not paying $6.00/bushel for the seed. I think secondly, that for every bushel that you buy for seed you are selling an additional bushel off the farm. Now I don't know whether you looked after that for the average yields or not. I think we have to watch this point because it was a very significant figure in your totals and I think that you are out about $4.00 per acre in your calculations.

Herman Austenson: Well, if you can buy wheat for $2.00 this spring you will have a lot of customers.

Comment: What I am saying is that when wheat is selling for $2.00/bushel your seed is not selling for $6.00 unless it is a new variety.

George Lee: This spring you will be seeding wheat out of this crop year and selling it for a price as yet undetermined. Last year for example, you seeded $2.00 wheat and have a possibility of selling it for $4.00 to $5.00. But when the price turns around, you could have the opposite situation occurring. Herman picked a very low figure, for our publication we used figures of $2.00, $3.50 and $5.00. All of these are possible prices for the crop you sold this spring. $2.00 we hope, is very unlikely.

Herman Austenson: Yes, the figures look extreme for 1973 when the price is in fact $5.00.

George Lee: And our expectation for the market is not $2.00.

Herman Austenson: Well, we hesitate to say what the expectation is, it might be $2.00.

<u>Question</u>: In your operating costs, the horsepower cost is
incorporated into the discing and cultivating
costs. Is this correct?

<u>Herman Austenson</u>: Yes, the tractor cost is incorporated with
the implement operations.