RESILIENT ROTATIONS:
NET REVENUE
NORTHERN PRAIRIES

Research has shown the benefits of diversifying crop rotations, and yet most Prairie farmers keep their rotations short and simple with cereals and oilseeds being intensively grown. For the past four years, researchers across Western Canada have compared different crop rotations to measure the drawbacks and benefits. This work is designed to help farmers make crop rotation decisions that are the best fit for their operation, based on local research.

Six different crop rotations were studied in Alberta, Saskatchewan and Manitoba to represent growing conditions in the Canadian Prairies. This factsheet looks at the differences between rotations for **net revenue.**

NET REVENUE

Net revenue was calculated by determining the total value of the yield (based on average crop prices from 2012-2021) from each crop and subtracting total costs. Total costs include seed cost, fertilizer costs, pesticide costs, other variable costs (oil and fuel, machinery repair, transportation, labor, and interest), and fixed costs (land, machinery, and storage). Machinery costs were based on the average Saskatchewan farm size in 2021 of 1,766 acres.

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TEN-YEAR (2012-2021) AVERAGE INPUT PRICES FOR CROP ROTATION TREATMENTS USED TO CALCULATE NET REVENUE

Rotation Treatment	Seed Costs $/acre	Fertilizer Costs $/acre	Pesticide Costs $/acre	Other Variable Costs $/acre	Fixed Costs $/acre	Total Cost $/acre
Control	$ 41	$ 58	$ 70	$ 49	$ 86	$ 304
Intensified	$ 53	$ 50	$ 73	$ 53	$ 91	$ 320
Diversified	$ 56	$ 41	$ 64	$ 51	$ 89	$ 301
Market Driven	$ 55	$ 77	$ 57	$ 56	$ 93	$ 338
High Risk	$ 63	$ 48	$ 59	$ 49	$ 88	$ 307
Soil Health	$ 54	$ 39	$ 51	$ 42	$ 78	$ 264

Input costs were highest for the **market driven** rotation and significantly lowest for the **soil health** rotation.

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NET RETURNS BY CROP ROTATION IN ALBERTA, 2018-2021

Rotation Treatment	Crop Species Used Based on Local Growing Conditions				Net Return Ranking of Various Crop Rotations*	
	Year 1	Year 2	Year 3	Year 4	Beaverlodge	Lacombe
The average net return of all rotations at Beaverlodge was $6 ac^{-1} (the highest net returns were for the diversified rotation at $57 ac^{-1}). The average net return of all rotations at Lacombe was $122 ac^{-1} (the highest net returns were for the market driven rotation at $234 ac^{-1}).						
Control	Wheat	Pea	Wheat	Canola	🟡	🟡
Intensified	Wheat	Canola	Wheat	Canola	🔴	🟡
Diversified	Pea	Winter Wheat	Faba Bean	Canola	🟢	🟡
Market Driven	Canola	Malt Barley	Canola	Canola	🟡	🟢
High Risk	Flax	Soybean	Durum	Canola	🟡	🟡
Soil Health	Forage Pea Green Manure	Winter Wheat	Faba Bean	Canola	🔴	🔴

NET RETURNS BY CROP ROTATION IN SASKATCHEWAN, 2018-2021

Rotation Treatment	Crop Species Used Based on Local Growing Conditions				Net Return Ranking of Various Crop Rotations*	
	Year 1	Year 2	Year 3	Year 4	Melfort	Scott
The average net return of all rotations at Melfort was $36 ac^{-1} (the highest net returns were for the control rotation at $71 ac^{-1}). The average net return of all rotations at Scott was $5 ac^{-1} (the highest net returns were for the market driven rotation at $110 ac^{-1}).						
Control	Canola	Wheat	Pea	Wheat	🟢	🟡
Intensified	Canola	Wheat	Canola	Wheat	🟢	🔴
Diversified	Pea	Winter Wheat	Faba Bean	Canola	🟢	🔴
Market Driven	Oat (Melfort) Canola (Scott)	Canola	Wheat (Melfort) Green Pea (Scott)	Canola	🔴	🟢
High Risk	Flax	Soybean	Durum	Canola	🔴	🔴
Soil Health	Forage Pea Green Manure	Winter Wheat	Faba Bean	Canola	🔴	🔴

Net Return Ranking*

🟢 = good net returns 🟡 = statistically lower net returns 🔴 = statistically lowest net returns

***Net Return ranking is calculated by location**

THE BOTTOM LINE

- The most profitable rotations varied depending on the geographic region. The **market driven** and **diversified** rotations can have higher net returns while the **soil health** rotation consistently has some of the lowest net returns.
- The net returns associated with the **market driven** rotation are attributed to the high frequency of canola in the rotation and the high canola crop prices. However, the **market driven** rotation also has the highest input costs. It is important to note that the **market driven** rotation often has canola being grown in three of four years, which is an agronomically risky practice which is not recommended due to the long term impacts of canola disease.
- The higher returns in the **diversified** rotation at Beaverlodge are driven by the good pea and faba bean yields. At Melfort, the higher net returns in the **diversified** rotation are driven by high wheat and canola yields.

FOR MORE INFORMATION

More information on how these crop rotations stack up in terms of yield and yield stability, precipitation use and nutrient use will be covered in separate factsheets as part of this series.

These results are based on the first four years of the study. More robust results are expected if a second four-year cycle of the study is completed.

This factsheet is part of a series by Resilient Rotations – a project of the Integrated Crop Agronomy Cluster – led by Kui Liu, AAFC Swift Current – the project examines the benefits and drawbacks of different crop rotation options for farmers across Western Canada.

To find out more visit
wgrf.ca/resilient-rotations-factsheet/

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