#05-November 2021

Drought Rebuilding Strategies:

Initial drought to herd recovery

When drought occurs, high feed costs make producers evaluate their options. The first is the availability and price of feed in their region. When feed availability is limited, producers may decide to cull heavier than normal to reduce feed demand. A smaller herd size results in higher costs per cow as overheads are spread over fewer animals. Once feed is available, it is desirable to get back to the initial herd size as quickly as possible to take advantage of those economies of scale for the operation. The longer it takes to rebuild, the more likely available pasture resources will not be optimized.

Producers have two options when rebuilding their herd.

1. Keeping back more heifers and foregoing revenue from heifer sales
2. Purchase breeding stock

The second option may be risky as producers often sell into a depressed market during drought, and if it is widespread, demand for bred heifers results in them buying back at much higher prices. However, rebuilding by keeping back replacements can limit the speed of recovery. After a drought producers may be exploring options they don't typically use.[1] This study evaluated the trade-offs between rebuilding with your own heifers versus purchasing breeding stock based on three different culling rates (25%, 50% and 75%).

The depth of culling will depend on the producer's feed inventory, importance of retaining herd genetics and cash flow. A herd with significant genetic investment may choose to pay more for feed to retain their cows. Another operation may see it as an opportunity to clean up their herd and be willing to cull deeper. Producers with higher culling rates (i.e., 15%) may not notice an increase of culling up to 20-25% compared to producers with a lower culling rate (i.e., 8-10%).

[1] https://www.beefresearch.ca/blog/replacement-heifers-money-management-and-momentum/?fbclid=IwAR35TGrCfZmdG9YlpOo8uqjxIPhCEiMbHaYOqFabwCnkK4hXMlHVe1QoG6Q

Possible culling strategies include:

1. Sell yearlings earlier than normal to stretch forage for cows (if present)
2. Pregnancy test early to cull opens and late calvers (this tightens up the calving season, providing a more uniform calf crop)
3. Cull cows that are older than a specified age
4. Cull based on disposition, thriftiness, productivity, conformation, etc.
5. Cull heavier bull(s) (that eat more) if cow numbers fall low enough
6. Sell some (or all) replacement heifers rather than retaining them

Other considerations when choosing a herd recovery strategy include:

1. Financial status and relationship with financial advisor
2. How severe the culling was (25%, 50%, or 75%)
3. Biosecurity concerns when purchasing breeding stock
4. Suitability of purchased breeding stock to the environment and management of one's operation.

Studies on rebuilding after drought in Australia indicate that it is more important to select, at the time of purchase, cattle that will return the herd to its previous level of genetic potential over the short to medium term, and not simply cattle that will return the herd to a certain number in the shortest period of time *(Bowen & Chudleigh, 2018), (Bowen & Chudleigh, 2019)*.

What we did

Herd rebuilding timeline, production costs, profitability, and cash flow from 2020 to 2029 were modeled under the two rebuilding options (using homegrown heifers and purchase bred heifers) and different culling rate (25%, 50% and 75%).

Abbreviations:

- Baseline - where producers maintained their herd size and paid for feed in 2021
- 25o – 25% culling rate rebuilding with own heifers
- 25p – 25% culling rate rebuilding with purchased bred heifers
- 50o – 50% culling rate rebuilding with own heifers
- 50p – 50% culling rate rebuilding with purchased bred heifers
- 75o – 75% culling rate rebuilding with own heifers
- 75p – 75% culling rate rebuilding with purchased bred heifers

Data from 17 farms in the CDN COP Network impacted by the 2021 drought from British Columbia to northwest Ontario was used in this scenario. The baseline year was 2020 with culling occurring in 2021 after calving. Feed and cattle prices were forecast to 2029. Cattle prices (cull cows, calves, feeders) were indexed based on the price trend from 1984-93, with the 1985 drought year corresponding to the 2021 year. The 2020 Alberta bred heifer price of $1,916/head was used for all farms and indexed with the 1984-93 calf price trend (See Table 1). Bred heifer prices were forecasted to peak in 2023, 36% higher than the drought year. Bull price

data was available from 1988, and therefore cow prices were used to index the missing years (1984-87).

Table 1a	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
84-93 calf price Index	100	100	113	136	135	126	127	130	128	130
Bred Heifer Price $/hd	1916	1916	2159	2607	2580	2421	2435	2493	2453	2491

Feed grain prices were based on 2020 actual, 2021 year to date, 2022 was held steady, then switched to the 2023-29 FAO Agriculture Outlook index. See Appendix A for crop yield indexing charts used for homegrown feed and cash crop production forecasting.

For the rebuilding with homegrown replacements scenario, the priority was to rebuild the herd as quickly as possible and therefore all heifers are retained and heifer calf sales are set to zero until that is achieved. We realize that no producer will have 100% replacement quality heifers. If they cannot cover cash costs, they will sell as many heifers as needed to do that before retaining heifers for rebuilding. Therefore, the rebuilding with own heifer scenarios is very aggressive compared to what would be expected to occur on farm. This was done due to the model limitations which do not optimize cash flow and require manual changes. For the smaller herds that were not covering cash costs in 2020 and relying on off-farm income - they would continue to do so during the rebuild, but to a greater degree.

For the purchased bred heifer scenarios, the goal was to grow the herd back to the original size as quickly as possible within the confines of cash flow. For example, the farm could get a loan to purchase 100% of the herd needed in 2023; but only if they have the cash flow to service that loan in the subsequent five years. We assumed that all bank loans for purchased bred heifers must be repaid within five years. It should be noted that we projected that interest rates increased 10% in 2023 (from 2.45% to 2.7%) and 2025. Note that many farms have off-farm income, this is assumed to hold steady over the forecast period.

The COP Network uses generic allocation. For the forecasting, allocation is based on cash returns by commodity, excluding 'changes in inventory' caused by culling and rebuilding. The COP Network and this study utilize the agri benchmark beef cost of production methodology.

What we found

Herd rebuilding timelines:

- Under the 25% culling rate scenario, rebuilding from either homegrown heifers or purchased replacements, the original herd size was reached by 2023 for all farms
- Under the 50% culling rate scenario, when rebuilding from homegrown heifers, the original herd size was reached by 2024 for all but 4 farms that took until 2025 (BC-1, SK-5, MB-2, ON-4).
- Under the 50% and 75% culling rate scenarios, when rebuilding from purchased replacements, the original herd size was reached by 2023 for all farms
- Under the 75% culling rate scenario, when rebuilding from homegrown heifers, the original herd size was reached by 2024 for one farm (AB-3); 2025 for 5 farms (AB-2, AB-

4, AB-5, AB-6, SK-4); 2026 for 8 farms (BC-1, AB-1, SK-1a, SK-1b, SK-3, SK-6, MB-1, MB-2); 2027 for 2 farms (BC-1, SK-5) and 2028 for one farm (ON-4).

- When rebuilding to previous herd size from homegrown replacement heifers, available pasture resources are not fully utilized for a portion of 10 years on several farms.

Cow herd size ranged between 54 and 350 head in the benchmark farms (see Table 1b).

Table 1b. Herd size and base cow culling rate

	BC1	BC2	AB1	AB2	AB3	AB4	AB5	AB6	SK1a	SK1b	SK3	SK4	SK5	SK6	MB1	MB2	ON4
Cows	65	90	212	280	172	54	221	152	350	350	245	120	135	135	320	225	100
Cull%	12.5	9.4	11.2	7	9	8.1	6	8	17.5	17.5	12	8	13.5	13.5	11	8	16

Total costs per cow (10-year average) were the lowest for the baseline scenario (where producers maintained their herd size and paid for feed in 2021) and the 25% culling rate. Rebuilding using homegrown heifers was the next best in terms of keeping costs per cow low (see Table 2). This applied to all farms except ON-4 where a 50% culling rate and rebuilding using homegrown heifers resulted in the lowest total costs per cow. Since the model uses generic allocation of overhead, and ON-4 has 43% of land in annual crops, when revenue drops from the cow-calf enterprise, a larger portion of the overhead gets covered by the crop enterprise. This does not mean that the farm is better off –the lower revenue with a 50% cut in cow numbers result in lower whole farm profitability (see Table 3).

Whole Farm Profitability (see Table 3):

- If feed could be found, purchasing feed (even at the higher prices) was the most profitable in the long-run as economies of scale were maintained, assuming a one-year drought. Given this scenario was for a one-year drought with elevated feed costs for two years (2021/22), larger feed expenditures in the drought year were worthwhile. However, this would be expected to change for a multi-year drought. In addition, some farms were unable to source feed even at the higher prices; so, culling was still required.
    - The percentage of feed purchased was highest in the baseline scenario (Table 7). However, total feed costs per cow over the entire period were impacted by overhead on homegrown feed, which increased at higher culling rates (spread over a smaller number of cows). Consequently, total feed costs per cow tended to be the lowest in the baseline scenario and at lower culling rates (Table 5).
- At a projected 25% culling rate, rebuilding using homegrown heifers (25o) was more profitable than purchasing heifers (25p) for 16 out of 17 farms.
    - One farm was an exception (SK-1a). They were forecasted to have higher returns in 2021/22 with a 25% culling rate and rebuilding with purchased heifers (25p) scenario. The revenue from retained ownership only drops in 2023 with a reduced calf crop in 2022, as it is assumed that in the fall of 2021 calves are retained and feed is sourced for them. This prioritized young animals with a smaller feed requirement over cows. Interest paid was actually lower in the 25p scenario.

- At a 50% culling rate, rebuilding using homegrown heifers (50o) was more profitable than purchasing heifers (50p) for 14 out of 17 farms. Three farms were an exception to this (AB-4, SK-1a, and SK-5).
    - For AB-4 the difference in whole farm profitability between the 50o and 50p scenarios was only 0.5%, indicating rebuilding using homegrown heifers or purchasing replacements was very similar. Given the rebuilding using homegrown heifers requires setting heifer sales to zero; it is probable that purchasing heifers would be the more viable option for this operation.
    - SK-1a had higher costs per cow and lower income per cow when purchasing; however whole farm profitability was 5.3% higher when purchasing replacements. This was impacted by overhead needing to be covered by other enterprises. Therefore, purchasing heifers to rebuild faster allows this operation to cover more overhead during the 10-year period, making the whole farm more profitable.
    - For SK-5 the difference was 1.7% between purchasing and rebuilding from homegrown heifers.
- At a 75% culling rate, rebuilding with purchased replacements (75p) was more profitable than using homegrown heifers (75o) for 15 out of 17 farms. At this severe culling rate, choosing not to purchase breeding females severely limits the capacity to generate calves for sale as heifers are kept for replacements. The additional sales and reduced feeding costs in the 2021 drought year improves initial cash flow performance; however, reduced cattle sales over the remaining years of the analysis results in relatively poorer cumulative cash flow figures. The exceptions to this were SK-3 and MB-2 farms.
    - For SK-3, the difference was 0.5% indicating rebuilding using homegrown heifers or purchasing replacements was very similar. Total costs per cow were lower and income per cow was higher when using homegrown heifers. Interest paid was 31% higher ($36,600 difference) when purchasing heifers, which means that using homegrown heifers to rebuild would be the best option for this operation.
    - For MB-2, the difference was 1.4%. Total costs per cow were lower and income per cow was higher when using homegrown heifers. Interest paid was 10% higher ($31,300 difference) when purchasing replacements, which means that rebuilding from homegrown heifers would be the best option for this operation.

Rebuilding with homegrown heifers

The assumption in these scenarios is that all heifers are retained in order to rebuild as quickly as possible, resulting in less revenue in early years, and negatively impacting cash flow.

If we use the benchmark heifer retention rate instead, most farms were unable to rebuild to their original herd size by 2029. Consequently, there is a prolonged period of lost economies of scale due to lower herd numbers and unoptimized available pasture resources. Adjustments in replacement rates are necessary for faster herd rebuilding and would realistically be something between what is presented here (setting heifer sales to zero) and historical replacement rates.

Purchased bred heifers to rebuild cow herd

- Farms generally responded to drought with additional sales, and then rebuilt numbers by 2023 by purchasing heifers.
- Purchasing heifers to rebuild the herd is often faster (see Herd Rebuilding Timeline)
    - Farms regained economies of scale faster with purchased heifers versus rebuilding with homegrown heifers when culling rates were 50% or higher.
- In most cases, purchasing heifers required taking on debt.
    - Requires good financial status and relationship with financial advisor
    - Cash flow deficits were more severe with purchasing heifers than rebuilding with own heifers; interest paid by the whole farm when purchasing replacements was 1% higher in the 25% culling scenario, 18% higher with a 50% culling rate and 21% higher in the 75% culling scenario.
- Cash flow deficits indicate that this strategy is risky, but more profitable (see Table 3) when higher culling rates (e.g., 75%) are used to regain economies of scale faster.

Capital Costs

The objective of any drought strategy is to minimize the equity drain on the operation. Table 8 provides the capital costs over the ten-year period; this includes liabilities and own capital used. The farms can be split into four groups:

1. Those where a lower culling rate of between 0-25% provided the least equity drain (BC-1, BC-2, AB-4, AB-5, AB-6, SK-1a, ON-4). Of these operations, all except SK-1a, had higher whole farm profitability when rebuilding from homegrown heifers, which provided the greatest capacity to pay off debt.
2. Those where a 50% culling rate provided the least equity drain (AB-2). Rebuilding from homegrown heifers provided the greatest whole farm profitability and capacity to pay off debt in this instance
3. Those where a culling rate of 75% provided the least equity drain (AB-1, AB-3, SK-1b, SK-3, SK-4, MB-1 and MB-2). Of these, all except SK-3 and MB-2, had the greatest whole farm profitability when rebuilding with purchased heifers.
4. Those with a smaller difference on equity between rebuilding with own heifers and purchasing (SK-5, SK-6), where other considerations (e.g. overall profitability of the cow-calf enterprise) will drive rebuilding decisions.

Cash Flow

Cash flow is a particular consideration when it comes to making rebuilding decisions. Cash flow can be challenged by large swings in costs, such as purchasing a large number of bred heifers at a high price. Even if it makes economic sense over the short term the cash flow can create a challenge when there are big swings from “normal” in 2020 to the purchase year in “2022” assuming that drought has broken and restocking is feasible (see Table 11). In addition, given the percentage of purchased feed is the highest in the baseline and 25% culling rate scenarios, limited cash flow may impede the ability of producers to undertake actions outlined in those scenarios.

Table 2. Total Costs per cow (10-year average, CDN$)

	BC-1	BC-2	AB-1	AB-2	AB-3	AB-4	AB-5	AB-6	SK-1a	SK-1b	SK-3	SK-4	SK-5	SK-6	MB-1	MB-2	ON-4
Baseline	1,514	1,288	829	925	827	1,454	678	1,090	1,132	841	1,142	1,635	1,725	798	917	849	1,765
25o	1,513	1,313	839	946	834	1,475	693	1,103	1,138	848	1,158	1,658	1,746	804	937	864	1,772
25p	1,554	1,340	860	984	871	1,512	732	1,142	1,154	861	1,179	1,689	1,773	831	965	883	1,793
50o	1,575	1,382	851	975	867	1,511	725	1,135	1,166	878	1,209	1,726	1,841	825	972	897	1,555
50p	1,698	1,478	968	1,118	997	1,638	858	1,270	1,258	946	1,297	1,831	1,925	927	1,087	994	1,648
75o	1,768	1,598	924	1,094	959	1,611	806	1,235	1,272	944	1,350	1,952	2,160	880	1,107	1,010	2,022
75p	1,983	1,814	1,211	1,433	1,298	1,959	1,164	1,583	1,466	1,129	1,567	2,211	2,273	1,142	1,336	1,252	2,160

All tables have the best number in green (e.g. lowest cost, highest profitability) and worst number in red (e.g. highest cost, lowest profitability).

Table 3. Whole Farm Profit, Thousand CDN dollars (10-year average)

	BC-1	BC-2	AB-1	AB-2	AB-3	AB-4	AB-5	AB-6	SK-1a	SK-1b	SK-3	SK-4	SK-5	SK-6	MB-1	MB-2	ON-4
Baseline	7.7	41.8	337.8	170.4	266.5	58.5	139.4	144.3	153.9	132.4	104.5	32.0	-41.4	539.6	63.2	40.6	35.1
25o	6.9	39.7	333.9	163.4	263.0	57.6	134.5	141.9	148.5	127.6	100.9	27.6	-44.1	537.4	56.2	38.2	35.2
25p	6.4	39.3	333.5	161.4	261.3	57.5	131.5	140.2	149.5	126.7	99.3	25.6	-45.7	536.5	52.4	34.8	34.5
50o	4.2	35.6	327.7	156.5	253.7	55.4	126.9	137.6	124.8	112.9	91.9	19.9	-54.4	532.7	46.0	30.3	32.2
50p	3.1	34.1	325.2	151.1	251.4	55.7	120.4	133.1	131.4	110.4	86.2	16.2	-53.4	530.8	32.1	20.6	30.6
75o	-1.9	25.6	309.2	133.7	239.3	51.8	107.3	124.4	71.0	80.1	69.9	3.6	-76.0	521.5	3.7	6.8	22.0
75p	-0.4	28.8	316.6	136.3	241.1	53.8	108.2	125.6	110.5	92.0	69.6	5.5	-61.7	524.6	6.3	6.8	25.0

Whole Farm Profit = Market returns (+coupled and decoupled government payments) – whole farm costs +/- capital gains/losses
Whole Farm Net Income = Whole farm profitability + depreciation

Table 4. Cow-Calf Enterprise Farm Income, per cow, Thousand CDN dollars (10-year average)

	BC-1	BC-2	AB-1	AB-2	AB-3	AB-4	AB-5	AB-6	SK-1a	SK-1b	SK-3	SK-4	SK-5	SK-6	MB-1	MB-2	ON-4
Base	-8.0	421.8	469.5	515.2	638.4	322.5	794.2	414.3	573.2	452.2	418.8	266.4	-311.7	593.7	464.5	458.5	-177.5
25o	-8.6	395.7	456.1	494.9	628.3	302.7	772.2	397.9	561.6	443.2	404.1	222.5	-343.6	581.9	444.1	445.4	-180.3
25p	-34.0	390.9	449.6	480.9	613.4	299.1	758.6	385.2	561.9	439.4	396.9	205.2	-355.6	572.6	431.9	433.4	-190.3
50o	-96.5	299.4	396.2	418.3	580.8	206.3	690.1	315.8	485.7	384.6	329.9	89.6	-500.1	525.2	377.6	374.4	26.9
50p	-155.1	268.0	358.6	368.0	530.3	188.1	643.6	272.5	479.9	365.6	288.5	42.6	-504.9	488.5	322.0	318.7	-23.9
75o	-375.5	-5.0	179.5	147.3	454.0	-99.0	431.5	46.8	263.3	216.1	95.8	-297.6	-980.1	351.2	123.5	142.1	-476.2
75p	-469.2	-87.4	78.7	23.3	316.5	-198.3	287.4	-73.0	257.8	155.4	-20.5	-390.8	-894.0	238.9	26.6	20.7	-542.1

Farm income after cash and depreciation costs

Table 5. Feed Costs per cow (10-year average, CDN$)

	BC-1	BC-2	AB-1	AB-2	AB-3	AB-4	AB-5	AB-6	SK-1a	SK-1b	SK-3	SK-4	SK-5	SK-6	MB-1	MB-2	ON-4
Baseline	695.2	519.3	307.9	351.7	246.2	607.2	253.3	361.6	460.7	482.9	368.8	502.2	432.8	329.6	331.6	408.7	542.0
25o	687.2	532.4	313.1	361.8	245.4	618.1	259.5	365.0	463.2	487.1	374.6	512.9	438.6	334.1	338.8	416.4	542.7
25p	700.2	526.9	309.5	360.5	245.1	609.0	256.7	363.9	462.7	484.0	369.9	509.2	437.1	331.6	335.6	413.3	542.9
50o	719.7	564.6	320.3	376.6	254.8	635.4	271.4	374.5	474.5	504.5	391.4	541.4	462.9	347.7	354.0	434.8	561.6
50p	728.0	547.9	315.0	375.8	255.4	613.2	264.0	373.6	472.2	489.4	378.3	530.3	452.2	339.9	346.3	424.5	557.2
75o	823.5	656.9	343.8	429.8	282.9	673.6	297.5	407.3	513.0	535.8	435.8	625.3	539.6	384.0	402.7	483.1	622.3
75p	789.8	602.9	323.6	405.5	279.4	645.9	277.6	399.4	492.5	508.0	409.4	588.7	491.0	361.5	369.5	447.2	580.6

Estimated total feed costs using cost of production on homegrown feed (incl: machinery, fuel, seed and fertilizer inputs) and market value for purchased feed.

Table 6. Purchased Feed costs per cow (10-year average, CDN$)

	BC-1	BC-2	AB-1	AB-2	AB-3	AB-4	AB-5	AB-6	SK-1a	SK-1b	SK-3	SK-4	SK-5	SK-6	MB-1	MB-2	ON-4
Baseline	132.1	102.0	50.1	20.6	5.6	164.9	58.7	51.2	142.6	433.9	122.0	48.6	91.6	53.5	73.7	241.5	64.9
25o	131.3	105.5	50.2	20.5	0.1	166.0	58.7	49.8	141.8	433.1	122.7	49.4	91.0	54.6	74.2	239.9	61.5
25p	127.8	100.1	46.9	20.2	0.1	156.0	56.4	48.2	140.5	430.1	118.1	45.8	89.4	51.5	71.7	237.8	60.7
50o	125.8	109.2	48.9	20.3	0.0	161.7	57.8	47.3	138.0	428.4	121.1	50.4	87.3	55.3	73.5	235.6	53.5
50p	124.7	97.5	41.4	19.5	0.0	143.7	53.3	45.9	133.9	417.3	111.0	42.0	85.3	47.4	68.1	231.8	52.2
75o	116.4	107.9	42.4	19.3	0.0	144.8	53.0	43.8	125.0	405.3	111.0	46.3	78.3	52.0	68.2	219.1	48.7
75p	121.8	94.9	33.5	18.8	0.0	135.8	49.0	44.3	127.2	404.4	108.4	39.0	82.1	44.3	64.6	225.8	50.7

Purchased feed and purchased of deficit homegrown feed

Table 7. Percentage of feed Purchased (over 10-year period)

	BC-1	BC-2	AB-1	AB-2	AB-3	AB-4	AB-5	AB-6	SK-1a	SK-1b	SK-3	SK-4	SK-5	SK-6	MB-1	MB-2	ON-4
Baseline	19%	20%	16%	6%	2%	27%	23%	14%	31%	90%	33%	10%	21%	16%	22%	59%	12%
25o	19%	20%	16%	6%	0%	27%	23%	14%	31%	89%	33%	10%	21%	16%	22%	58%	11%
25p	18%	19%	15%	6%	0%	26%	22%	13%	30%	89%	32%	9%	20%	16%	21%	58%	11%
50o	17%	19%	15%	5%	0%	25%	21%	13%	29%	85%	31%	9%	19%	16%	21%	54%	10%
50p	17%	18%	13%	5%	0%	23%	20%	12%	28%	85%	29%	8%	19%	14%	20%	55%	9%
75o	14%	16%	12%	4%	0%	21%	18%	11%	24%	76%	25%	7%	15%	14%	17%	45%	8%
75p	15%	16%	10%	5%	0%	21%	18%	11%	26%	80%	26%	7%	17%	12%	17%	50%	9%

Percentage of feed purchased = Purchased feed cost (Table 6) divided by estimated total feed costs (Table 5).

Table 8. Capital Costs per cow, Thousand CDN dollars (10 year average)

	BC-1	BC-2	AB-1	AB-2	AB-3	AB-4	AB-5	AB-6	SK-1a	SK-1b	SK-3	SK-4	SK-5	SK-6	MB-1	MB-2	ON-4
Baseline	113.8	108.3	41.5	68.8	21.3	125.7	61.3	80.5	78.5	53.2	95.4	74.3	2.1	13.3	71.3	18.6	76.1
25o	114.9	110.1	41.4	70.1	20.6	126.9	62.7	81.1	78.8	53.8	96.8	67.0	2.1	13.3	73.4	16.9	76.0
25p	114.8	109.6	41.4	70.1	20.6	127.9	62.4	81.4	78.7	53.7	96.2	63.5	2.1	13.3	73.7	14.3	76.0
50o	117.4	115.7	37.8	66.4	19.0	127.0	64.8	81.8	80.4	53.7	100.2	50.1	2.2	13.3	70.6	10.8	76.5
50p	117.3	114.9	41.2	71.8	19.4	130.1	65.2	82.4	80.7	52.7	93.8	38.1	2.1	13.3	78.7	5.8	77.5
75o	123.4	129.9	36.3	69.4	16.7	125.9	68.1	80.7	86.0	51.1	98.2	10.4	2.3	13.2	74.2	2.3	78.4
75p	118.8	109.2	40.6	74.3	17.6	131.8	69.7	83.6	85.5	50.2	84.3	8.1	2.2	13.4	69.1	2.1	81.3

Capital costs are impacted by overheads being spread over fewer cows when culling occurs.

Table 9. Percentage of own capital (over 10 year period)

	BC-1	BC-2	AB-1	AB-2	AB-3	AB-4	AB-5	AB-6	SK-1a	SK-1b	SK-3	SK-4	SK-5	SK-6	MB-1	MB-2	ON-4
Baseline	98%	73%	67%	91%	39%	84%	95%	81%	82%	61%	64%	50%	0%	42%	65%	42%	76%
25o	98%	73%	67%	91%	39%	84%	95%	80%	82%	59%	63%	45%	0%	42%	63%	41%	77%
25p	98%	73%	67%	90%	39%	84%	95%	80%	83%	59%	63%	43%	0%	42%	61%	40%	78%
50o	97%	70%	66%	90%	39%	84%	95%	80%	78%	56%	61%	39%	0%	41%	61%	38%	78%
50p	94%	65%	67%	89%	39%	83%	90%	77%	80%	55%	59%	38%	0%	42%	52%	30%	77%
75o	90%	62%	66%	86%	38%	84%	92%	79%	68%	48%	55%	35%	0%	41%	43%	0%	75%
75p	85%	63%	67%	83%	38%	83%	80%	72%	70%	51%	53%	32%	0%	41%	43%	0%	71%

Own capital comes from drawing on farm equity build up in the past versus having to barrow from a bank.

Table 10. Interest paid (whole farm), Thousand CDN dollars (10 year average)

	BC-1	BC-2	AB-1	AB-2	AB-3	AB-4	AB-5	AB-6	SK-1a	SK-1b	SK-3	SK-4	SK-5	SK-6	MB-1	MB-2	ON-4
Baseline	0.17	2.72	15.78	4.17	31.58	2.59	1.34	4.85	7.34	21.34	8.85	12.03	64.59	24.02	15.62	26.36	4.09
25o	0.17	2.73	15.77	4.20	31.58	2.60	1.35	4.86	7.49	22.23	8.87	13.56	65.53	24.04	16.48	26.67	3.88
25p	0.18	2.75	15.79	4.26	31.60	2.59	1.44	4.87	7.06	22.28	8.83	14.13	65.99	24.04	17.32	27.60	3.74
50o	0.29	2.99	15.73	4.15	31.61	2.61	1.36	4.88	8.88	24.91	9.37	16.29	68.73	24.07	15.94	26.31	3.74
50p	0.54	3.43	15.85	4.73	31.67	2.62	2.80	5.48	7.87	25.08	10.97	17.48	68.48	24.08	22.38	30.89	3.81
75o	0.81	3.52	15.80	5.42	31.66	2.63	2.11	4.98	12.53	30.48	11.94	21.33	74.11	24.13	27.87	31.04	4.04
75p	1.27	4.15	15.95	7.42	31.75	2.67	5.28	6.49	11.67	29.07	15.60	22.14	71.19	24.15	33.08	34.17	4.91

Interest paid on bank loans. This is impacted by the portion pulled from own capital versus the necessity of a bank loan.

Table 11. Total costs per cow in 2022 divided by 2020 (percentage change)

	BC-1	BC-2	AB-1	AB-2	AB-3	AB-4	AB-5	AB-6	SK-1a	SK-1b	SK-3	SK-4	SK-5	SK-6	MB-1	MB-2	ON-4
Baseline	-2%	1%	-5%	1%	1%	-13%	0%	0%	1%	4%	0%	0%	1%	-8%	5%	5%	-8%
25o	8%	18%	4%	18%	20%	-1%	16%	13%	6%	11%	13%	18%	15%	-2%	20%	22%	-2%
25p	25%	41%	36%	55%	60%	25%	74%	50%	18%	24%	34%	40%	30%	26%	46%	48%	8%
50o	38%	63%	24%	45%	57%	18%	47%	43%	21%	39%	52%	68%	54%	17%	49%	51%	7%
50p	114%	143%	155%	185%	214%	103%	250%	172%	99%	116%	133%	147%	116%	138%	161%	179%	70%
75o	97%	166%	69%	107%	151%	60%	103%	112%	56%	78%	130%	189%	146%	61%	109%	101%	64%
75p	300%	399%	437%	510%	594%	311%	694%	479%	271%	323%	370%	409%	315%	393%	428%	482%	205%

Cash flow can be challenged by large swings in costs, such as purchasing a large number of bred heifers at a high price. Even if it makes economic sense over the short term the cash flow can create a challenge when there are big swings from “normal” in 2020 to the purchase year in “2022” assuming that drought has broken and restocking is feasible.

Resources

Chibanda et al (2020) The Typical Farm Approach and its Application by the Agri benchmark Network. Agriculture 10:646 doi:10.3390/agriculture10120646 https://literatur.thuenen.de/digbib_extern/dn063149.pdf

Bowen, & Chudleigh. (2018, December). *Fitzroy beef production systems - Preparing for, responding to, and recovering from drought.* Retrieved from https://futurebeef.com.au/wp-content/uploads/2019/01/DCAP-DAF6_Fitzroy_Management-strategies-for-drought-resilience_May-2019.pdf

Bowen, & Chudleigh. (2019). *Central West Mitchell Grasslands livestock production systems - Preparing for, responding to, and recovering from drought.* Retrieved from https://futurebeef.com.au/wp-content/uploads/2019/11/DCAP-DAF6_Central-West-Mitchell-Grasslands_Management-strategies-for-drought-resilience_September-2019.pdf

Department of Agriculture and Fisheries. (2020). *Beef-Recovering from Drought.* Retrieved from https://futurebeef.com.au/wp-content/uploads/2020/06/recovering-from-drought-beef-industry-factsheetfinal.pdf

farmprogress. (2021, August 5). *6 criteria for culling cattle during drought*. Retrieved from farmprogress.com: https://www.farmprogress.com/beef/6-criteria-culling-cattle-during-drought

Drought Resources:

BCRC article: Decision Making During Drought

- Culling, early weaning, and drylot cow herd

https://www.beefresearch.ca/blog/decision-making-during-drought/#more-10523

BCRC article: Experts Respond to Drought Questions

- Feed testing and supplements, water testing, be aware of additive effects and interactions, take caution in feeing weeds
- Ammonization can be used to increase the protein content of straw

https://www.beefresearch.ca/blog/expert-responses-to-drought-questions/#more-10424

BCRC article: Resources for Drought Management

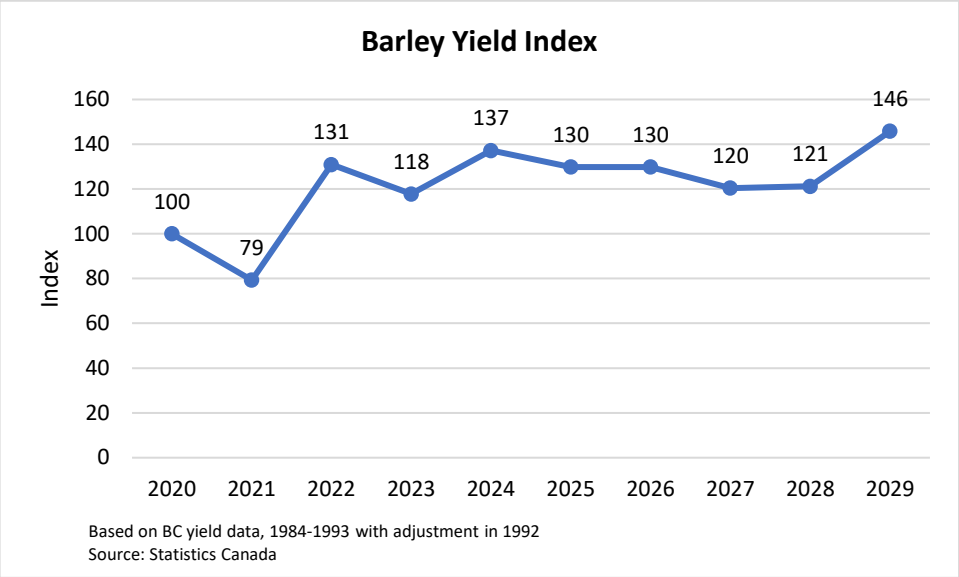
- Combine groups of cattle to encourage grazing of less desirable plants. Increase pasture recovery time.
- portable stock water supply. maintain water quality and prevent cattle from getting stuck in watering sites that are drying up. test stock water quality
- de-stock of drought persists

https://www.beefresearch.ca/blog/resources-for-drought-management/#more-10067

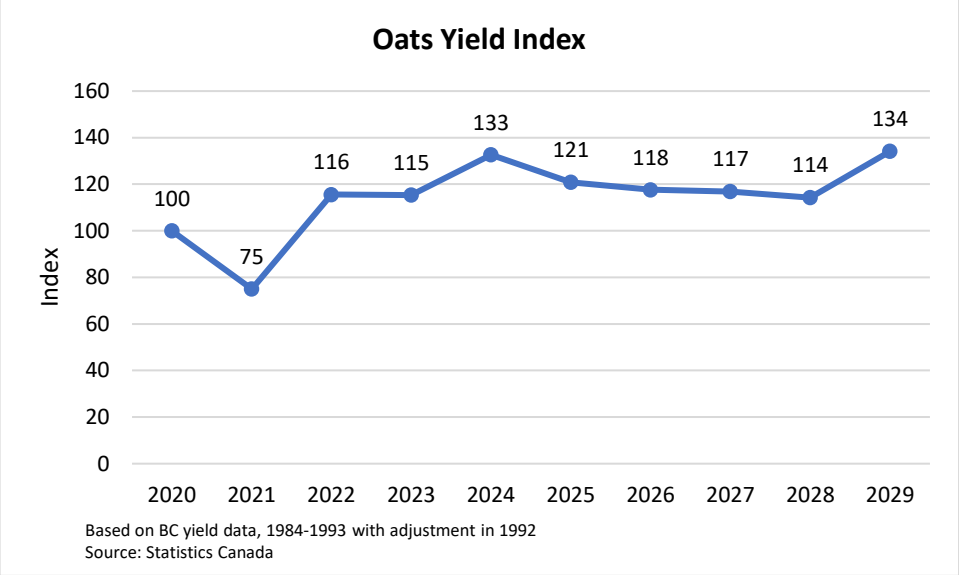
BCRC article: Weed and Brush Control in Pastures

https://www.beefresearch.ca/blog/weed-and-brush-control-in-pastures/#comment-31031

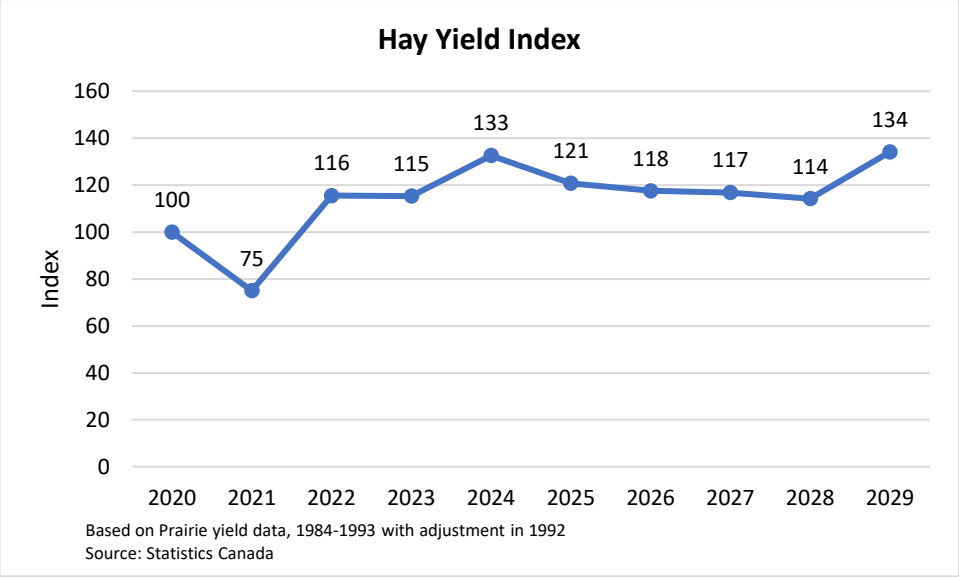
Appendix A: Crop Yield Charts



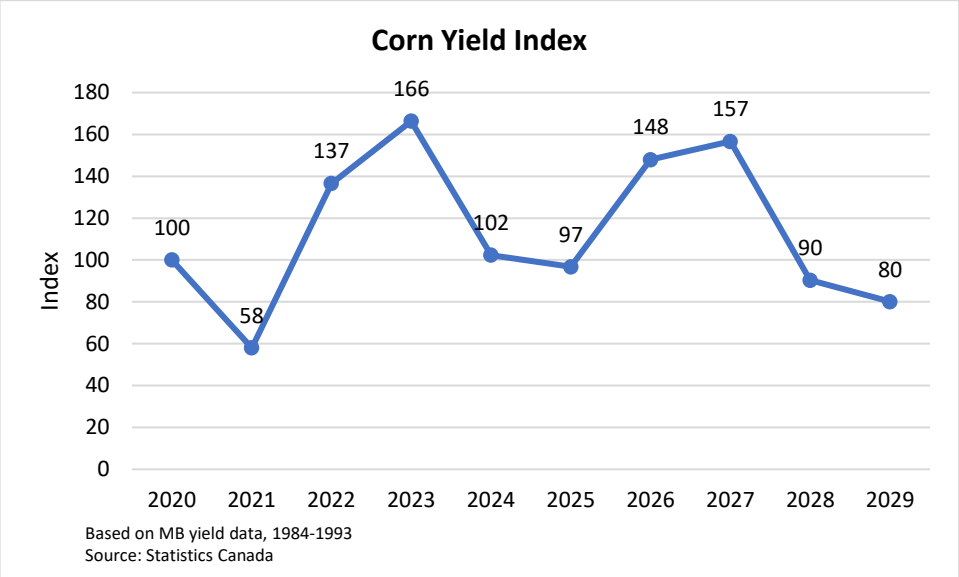
Based on BC yield data, 1984-1993 with adjustment in 1992
Source: Statistics Canada



Based on BC yield data, 1984-1993 with adjustment in 1992
Source: Statistics Canada



Based on Prairie yield data, 1984-1993 with adjustment in 1992
Source: Statistics Canada



Based on MB yield data, 1984-1993
Source: Statistics Canada