

Status Report 2019

Implementing Agricultural Strategies in
the South Saskatchewan Regional Plan
(2014–2024)



Preface

Guided by the vision, outcomes and strategic directions, the South Saskatchewan Regional Plan (2014 – 2024) has 122 implementing strategies under eight broad intended outcomes. As a means of assessing the level of progress made towards achieving the outcomes, various core and additional indicators are identified and regularly monitored, evaluated and reported on.

Alberta Agriculture and Forestry implements and annually reports on 12 agriculture related strategies. This report compiles implementation status of these 12 strategies up to the end of 2019.

Previous reports and relevant documents can be viewed [here](#) and [here](#).

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| Strategies | Measurable Indicators | Implementation Status |
|--|--|---|
| 1.1. Maintain a viable agricultural land base by reducing the fragmentation and conversion of agricultural land | 1. Agricultural land conversion 2. Agricultural land fragmentation | Ongoing Published separately. Click here to view report. |
| 1.2. Support a diverse and innovative irrigated agriculture and agri-food sector. | 1. Alberta’s irrigation strategy 2. Irrigation related initiatives | Complete |
| 1.3. Assist the agriculture and agri-food industry to maximize opportunities for value-added agricultural products. | 1. Value added products developed and marketed (GF2/CAP supported projects) | Ongoing |
| 1.4. Support a business climate and complementary production and marketing approaches that recognize the contribution of local production in addition to existing domestic and international market opportunities for Alberta’s agriculture, agri-food and agri-product sectors. | 1. Alberta approved farmers’ market 2. Farm cash receipts 3. Trade balance 4. Red tape reduction | Ongoing |
| 1.5. Support and enhance the next generation of agricultural, food and rural entrepreneurs. | 1. Green Certificate Program 2. Beginning farmer incentive 3. Farm demography | Ongoing |
| 1.6. Encourage the use of voluntary market-based instruments for ecosystem services in order to recognize and reward the continued stewardship and conservation of private agricultural land and potentially diversify the agricultural economy. | 1. Pilot projects and collaborative initiatives to promote private land stewardship 2. Relevant projects funded by AF | Ongoing |
| 1.9. Ensure policies are in place to promote and remove barriers to new investments in renewable energy (that is, wind, biofuels, solar, hydro) production. | 1. Renewable energy initiatives | Ongoing |
| 1.10. Invest in the development, demonstration and deployment of renewable and alternative energy technologies targeted to improve Alberta’s overall energy efficiency. This will include support for the application of new technologies and on-going research and development in partnership with other agencies and institutions. | 1. Renewable energy initiatives | Ongoing |
| 3.15. Encourage and support the continued stewardship of Alberta’s private lands through the development and piloting of regionally appropriate conservation tools. | 1. Pilot projects and collaborative initiatives to develop conservation tools for private lands. 2. Alternative Land Use Services 3. Life Cycle Assessment 4. Conservation easement for agricultural land | Ongoing |
| 3.16. Complete development and evaluation of the Southeast Alberta Conservation Offset Pilot by the end of 2015 | 1. SEACOP pilot project | Complete |
| 3.17. Develop and facilitate the continued voluntary adoption of beneficial management practices that demonstrate agriculture and agri-food sector commitment to environmental stewardship. | 1. BMP related projects and initiatives 2. Environmentally Sustainable Agriculture Tracking Survey | Ongoing |
| 4.10. Continue to develop an optimized water management system in the region. | 1. Ongoing projects and initiatives on irrigation and water management | Ongoing |

Strategy 1.2

Support a diverse and innovative irrigated agriculture and agri-food sector

The South Saskatchewan Region contains 97 per cent of Alberta’s, and almost 65 per cent of Canada’s total irrigated lands. Agriculture in this region is highly diversified, growing more than 50 different crops and contributing up to 20 per cent of Alberta’s agricultural Gross Domestic Product. A strong irrigation infrastructure provides reliable support for food, feed and bio-industrial production, and agri-food processing plants in the region. Under Strategy 1.2 in the South Saskatchewan Regional Plan, Alberta Agriculture and Forestry (AF) is committed to supporting a diverse and innovative irrigated agriculture and agri-food sector in the region through the implementation of [Alberta’s Irrigation – A Strategy for the Future](#). Click [here](#) for relevant updates.

In the South Saskatchewan River basin, approximately 707,000 hectares of land is currently irrigated under 13 irrigation districts and private projects. Irrigated land produces forages, cereal grains, oilseeds, and a variety of specialty crops. The following information provides a brief overview of AF’s work in support of Strategy 1.2 in the South Saskatchewan Regional Plan. AF’s support includes provision of research funding to the Alberta Irrigation Projects Association and the promotion of technology adoption through evidence-based policies to support recommendations for a diverse and innovative irrigated agriculture.

Farm Types and Crop Mixes in the Six Representative Irrigation Districts

In order to demonstrate the farm financial and risk exposure of irrigated farm enterprises, six representative irrigation districts have been shown in Table 1, each having one or more of the five common farm types listed below:

- 1. Forage Mix – Farms with mainly forage crops and some grains.
- 2. Grain and Forage Mix – Farms with mainly grains and some forage crops.
- 3. Grain and Oilseed Mix – Farms with only grains and oilseeds.
- 4. Potato Mix – Farms with potatoes, grains, and oilseeds.
- 5. Sugar Beet Mix – Farms with sugar beets, grains, and forages.

Table 2 gives a snapshot of inputs and input prices for irrigated crops primarily based on conditions in 2018/2019. Capital asset depreciation and capital asset replacement at the whole farm level are presented in Table 3. Variable costs of irrigation were computed as a linear function of the amount of water applied to the field expressed as the cost per millimeter of water applied per hectare.

Table 4 shows results from the Farm Financial Impact and Risk Model (FFIRM). The average annual net farm income (NFI) for the representative farms in the six irrigation districts ranged from \$18,151 to \$32,627 for the Grain and Oilseed Mix, from \$40,984 to \$86,334 for the Grain and Forage Mix, from \$79,882 to \$154,116 for the Forage Mix, from \$109,439 to \$157,375 for the Sugar Beet Mix, and from \$269,164 to \$293,296 for the Potato Mix.

Differences in NFI among the six irrigation districts are attributed to the specific crop mixes in each district (Table 1), the associated crop prices and production costs (Tables 2 and 3), and variation in evaporative demand and water supplies from year to year that affects crop yield.

Water savings from improved efficiencies of water management and operations in irrigation districts may lead to increase expansion limits within existing licensed water allocations. Increased commodity prices during the last two decades, improved crop varieties, and agronomic practices that have enhanced the yield potential of irrigated crops have allowed irrigation expansion without significant changes in NFI. Crop diversification and inclusion of crops with greater value in crop rotations are key factors for increasing farm financial viability and stability.

Table 1. Representative farm types and crop mixes in the largest six irrigation districts

| Irrigation District (ha) | Farm Type | Crop Mix (Per cent of Farm Area) | | | | | | | | | | |
|--------------------------------|-------------------|----------------------------------|---------------|------------|-----------|-------------|-----------|--------|--------|------------|----------|--------|
| | | Alfalfa | Barley Silage | Tame Grass | HRS Wheat | Durum Wheat | SWS Wheat | Barley | Canola | Sugar Beet | Dry Bean | Potato |
| Glenwood-Magrath (223) | Grain and Forage | 30 | | | | 20 | | 30 | 20 | | | |
| | Forage | 40 | | 30 | | | | 30 | | | | |
| Lethbridge-Picture Butte (304) | Grain and Oilseed | | | | 30 | 20 | | 20 | 30 | | | |
| | Sugar Beet | 30 | | | 30 | | | 20 | | 20 | | |
| | Grain and Forage | 25 | 25 | | 20 | | | 30 | | | | |
| Taber-Bow Island (356) | Forage | 30 | 30 | 20 | | 20 | | | | | | |
| | Grain and Oilseed | | | | 30 | 20 | | 20 | 30 | | | |
| | Sugar Beet | 30 | | | 30 | | | | | 20 | 20 | |
| | Potato | | | | 25 | | | 25 | 25 | | | 25 |
| | Forage | 30 | 30 | 20 | | 20 | | | | | | |
| Vauxhall (324) | Grain and Oilseed | | | | 30 | | 20 | 20 | 30 | | | |
| | Sugar Beet | 30 | | | 30 | | | 20 | | 20 | | |
| | Potato | | | | 25 | | | 25 | 25 | | | 25 |
| | Forage | 30 | 30 | 20 | | 20 | | | | | | |
| Strathmore (219) | Grain and Forage | 25 | 25 | | 20 | | | 30 | | | | |
| | Forage | 40 | | 30 | | | | 30 | | | | |
| | Grain and Oilseed | | | | 30 | 20 | | 20 | 30 | | | |
| Brooks-Gleichen (235) | Grain and Forage | 25 | 25 | | 20 | | | 30 | | | | |
| | Forage | 30 | 30 | 20 | | 20 | | | | | | |

Table 2. Variable cash costs for major irrigated crops (\$ ha⁻¹)

| | HRS Wheat | SWS Wheat | Barley | Canola | Dry Bean | Potato | Sugar Beet | Alfalfa (2-cut) | Grass Hay | Barley Silage |
|---|-----------|-----------|--------|--------|----------|--------|------------|-----------------|-----------|---------------|
| Seed | 45.8 | 45.8 | 43.0 | 86.0 | 143.3 | 802.6 | 286.6 | 28.7 | - | 40.1 |
| Fertilizer | 186.3 | 186.3 | 186.3 | 229.3 | 172.0 | 601.9 | 200.7 | 57.3 | 5.7 | 172.0 |
| Chemicals | 100.3 | 100.3 | 91.8 | 143.3 | 243.6 | 716.5 | 243.6 | 8.6 | - | 57.3 |
| Hail/Crop Insurance | 34.5 | 34.5 | 14.4 | 34.5 | 86.0 | 186.3 | 86.0 | | - | 34.5 |
| Trucking & Marketing | 8.6 | 14.4 | 5.7 | 5.7 | 28.7 | 372.6 | 286.6 | 28.7 | - | 114.6 |
| Fuel & Lubricants | 65.9 | 71.7 | 71.7 | 71.7 | 100.3 | 286.6 | 157.6 | 114.6 | 40.1 | 86.0 |
| Machinery Repairs & Maintenance | 63.1 | 65.9 | 63.1 | 60.2 | 86.0 | 358.3 | 186.3 | 86.0 | 43.0 | 57.3 |
| Utilities | 43.0 | 43.0 | 43.0 | 43.0 | 57.3 | 315.3 | 86.0 | 114.6 | 34.5 | 43.0 |
| Custom work | 37.2 | 37.2 | 23.0 | 28.7 | 71.7 | 429.9 | 86.0 | 40.1 | 2.9 | 57.3 |
| Paid Labour | - | - | - | - | 86.0 | 745.3 | 172.0 | 14.4 | 14.4 | 14.4 |
| Supplies, Small Tools and Professional Fees | 55.9 | 60.2 | 68.8 | 129.0 | 91.8 | 372.6 | 86.0 | 157.6 | 43.0 | 80.3 |
| Property Tax, Insurance, Water Rights | 51.6 | 51.6 | 53.0 | 71.7 | 83.2 | 129.0 | 86.0 | 74.5 | 25.8 | 37.2 |
| Total | 692.3 | 711.0 | 663.8 | 902.9 | 1250 | 5317 | 1963 | 725.0 | 209.4 | 794.0 |

Table 3. Irrigation system capital costs, variable costs, and application efficiencies.

| Irrigation System | Variable Costs | | | | |
|---------------------------------|------------------------|---|------------|-------------|-------------------------------------|
| | Capital Cost | Labour Cost | R & M Cost | Energy Cost | Application Efficiency ¹ |
| | (\$ ha ⁻¹) | (\$ mm ⁻¹ ha ⁻¹) | | | (Percent) |
| Gravity – Developed | 1,190 | 0.109 | 0.025 | 0.000 | 55 |
| Gravity – Flood | 370 | 0.138 | 0.007 | 0.000 | 42 |
| Sprinkler – Wheel Move | 1,630 | 0.091 | 0.072 | 0.279 | 77 |
| Sprinkler – Pivot High Pressure | 2,070 | 0.030 | 0.131 | 0.235 | 84 |
| Sprinkler – Pivot Low Pressure | 2,010 | 0.030 | 0.133 | 0.180 | 71 |

¹ [Alberta Irrigation Information](#). Alberta Agriculture and Forestry (2019)

Table 4. Net Farm Income (NFI) for representative farms in six irrigation districts.

| <i>Irrigation Region</i> | Farm Type | NFI (\$) |
|---------------------------------|-----------------------|-----------------|
| <i>Glenwood-Magrath</i> | Grain and Forage Mix | 55,821 |
| | Forage Mix | 85,209 |
| <i>Lethbridge-Picture Butte</i> | Grain and Oilseed Mix | 32,627 |
| | Sugar Beet Mix | 109,439 |
| | Grain and Forage Mix | 86,334 |
| <i>Taber-Bow Island</i> | Forage Mix | 132,408 |
| | Grain and Oilseed Mix | 18,151 |
| | Sugar Beet Mix | 157,375 |
| | Potato Mix | 293,296 |
| <i>Vauxhall</i> | Forage Mix | 154,116 |
| | Grain and Oilseed Mix | 19,662 |
| | Sugar Beet Mix | 127,161 |
| | Potato Mix | 269,164 |
| | Forage Mix | 144,629 |
| <i>Strathmore</i> | Grain and Forage Mix | 40,984 |
| | Forage Mix | 79,882 |
| <i>Brooks-Gleichen</i> | Grain and Oilseed Mix | 25,130 |
| | Grain and Forage Mix | 44,282 |
| | Forage Mix | 102,180 |

Economics and Competitiveness Branch, Alberta Agriculture and Forestry, 2020

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Strategy 1.3

Assist the agriculture and agri-food industry to maximize opportunities for value-added agricultural products.

Canadian Agricultural Partnership

The [Canadian Agricultural Partnership](#) (CAP, 2018 - 2023) is the current Federal-Provincial-Territorial Policy Framework that came into effect in 2018 upon completion of the *Growing Forward 2* (2013 – 2018). CAP allows Alberta to implement various agricultural programs on a cost-shared basis with the federal government. Under this framework, each province or territory designs its own programs within the priorities agreed upon in the multilateral framework and bilateral agreement with the federal government.

Under the CAP, \$69.7million has been invested in Alberta's agriculture sector for cost-shared strategic initiatives over the first 2 years (2018-2020). The CAP programs are grant programs that provide incentives to producers and processors by reimbursing a portion of their costs for approved activities or investments that met specific criteria.

During 2018-2020, Alberta Agriculture and Forestry delivered three CAP Products, Market Growth and Diversification (PMGD) Theme programs focused on assisting Alberta-based agri-processors (including food and bio-industrial processors, producers adding value past primary production, agri-based businesses) to expand their operations. The CAP Products to Markets, Value-Added Products to Markets and Emerging Opportunities programs assist applicants to develop new products, access new markets, and/or expand their business. A total of 238 grants were awarded to 198 different companies. The projects resulted in a variety of benefits for recipients, including at least 582 new value-added agriculture-based products being successfully introduced to the market. These products include a combination of food, bio-industrial, and other agriculture-based products. The distribution of CAP PMGD recipients across Alberta's Land Use Framework regions can be found in Table 1.

Table 1: Number of agri-processing companies that received CAP Products, Markets, Growth and Diversification Theme Grants (2018-2020)

| Region* | Number |
|--------------------|------------|
| South Saskatchewan | 99 |
| North Saskatchewan | 72 |
| Red Deer | 18 |
| Upper Peace | 4 |
| Upper Athabasca | 3 |
| Lower Peace | 0 |
| Lower Athabasca | 1 |
| Out of Province | 1 |
| Total | 198 |

Note: Some applicants received multiple grants within the CAP PMGD Theme. The number of recipients that received assistance through each program does not necessary always reflect the total number of grants awarded.

Growing Forward 2

The *Growing Forward 2* (GF2, 2013 - 2018) was a Federal-Provincial-Territorial Policy Framework similar to CAP that allowed Alberta to implement various agricultural programs on a cost-shared basis with the federal government. The GF2 ended in March 2018 followed by the Canadian Agricultural Partnership (CAP, 2018-2023).

Under the GF2, \$406 million was invested in Alberta's agriculture sector for cost-shared strategic initiatives over five years (2013-2018). The GF2 programs were mainly grant programs that provided incentives to producers and processors by reimbursing a portion of their costs for approved activities or investments that met specific criteria.

During 2013-2018, AF delivered on two GF2 Agri-Processing Grant Programs focused on assisting Alberta-based agri-processors (including food processors, bio-industrial processors and agri-based product processors) to expand their businesses. Funding support was provided to a total of 360 processors with investment targeted on capitalizing on

opportunities in the value-added agricultural product processing sector. The distribution of these companies across Alberta’s Land Use Framework (LUF) regions can be found in Table 1.

Table 1: Number of agri-processing companies that received GF2 Agri-Processing Grants – Livestock and Crops combined during 2013-2018

| Region* | Number |
|---|------------|
| South Saskatchewan | 171 |
| North Saskatchewan | 115 |
| Red Deer | 42 |
| Upper Peace | 13 |
| Upper Athabasca | 6 |
| Lower Peace | 4 |
| Lower Athabasca | 1 |
| Out of Province** | 8 |
| Total | 360 |
| * If one entity received a grant to operate in multiple regions, that was counted in each region. | |
| ** Operation within the Province but the company head office out of the Province. | |

The GF2 Agri-Processing Product and Market Development (APMD) program assisted agri-processors to develop new products, access new markets, and/or expand their businesses. A total of 360 different agri-processors benefited from this grant program resulting in at least 425¹ new value-added agriculture-based products coming to the market. This included a combination of food products, bio-industrial products, and agri-product-based products. The distribution of APMD recipients across Alberta’s LUF regions can be found in Table 2.

Table 2: Number of agri-processing companies that received GF2 Agri-Processing Product and Market Development Grants (2013-2018)

| Region | Number* |
|---|------------|
| South Saskatchewan | 101 |
| North Saskatchewan | 73 |
| Red Deer | 22 |
| Upper Peace | 3 |
| Upper Athabasca | 2 |
| Lower Peace | 2 |
| Lower Athabasca | 0 |
| Total (Alberta) | 203 |
| *These numbers should be interpreted with caution because grants approved during 2013 – 2014 may not be included in this table. | |

The GF2 Agri-Processing Automation and Efficiency (AAE) program assisted existing agri-processors in improving their productivity, efficiency and energy efficiency through the adoption of best practices, new technologies and state-of-the art processes that increase value and market access. A total of 243 agri-processors benefited from this grant program which resulted in company expansion through increased automation, increased efficiency, and/or increased processing capacity. This was largely achieved through the acquisition of new processing equipment. The distribution of AAE recipients across Alberta’s LUF regions can be found in Table 3 below.

¹ Number may not include the products developed in 2013 – 2014, if any.

Table 3: Number of agri-processing companies that received GF2 Agri-Processing Automation and Efficiency Grants (2013-2018).

| Region | Number |
|--------------------|------------|
| South Saskatchewan | 110 |
| North Saskatchewan | 77 |
| Red Deer | 31 |
| Upper Peace | 11 |
| Upper Athabasca | 5 |
| Lower Peace | 2 |
| Lower Athabasca | 1 |
| Out of Province | 6 |
| Total | 243 |

Note: Some applicants received multiple grants within the GF2 Agri-processing Grant Program. The number of agri-processing companies that received assistance through each program does not necessary always reflect the total number of grants awarded.

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Strategy 1.4

Support a business climate and complementary production and marketing approaches that recognize the contribution of local production in addition to existing domestic and international market opportunities for Alberta's agriculture, agri-food and agri-product sectors.

The following information provides an overview of Alberta Agriculture and Forestry's (AF) work in support of Strategy 1.4 in the South Saskatchewan Regional Plan. Support for local production and facilitation of domestic markets occurs through the Alberta Approved Farmers' Market Program, while support for international market opportunities is made through market development and investment attraction programs. Performance in both domestic and international markets can be indirectly measured by Farm Cash Receipts (FCR) and agricultural trade balance (exports less imports) for Alberta.

Supporting Alberta's Local Food Sector Act

To promote Alberta's local food producers and to support the Province's local food industry, AF introduced *Supporting Alberta's Local Food Sector Act, 2018*. Passed on May 30, 2018, the Act:

- Recognizes the value and importance of local food providers in the provincial economy and Albertans' quality of life;
- Acknowledges that Alberta producers, processors and other members of the Province's supply chain are instrumental to meeting consumer demand for fresh and healthy local food and beverages that are grown, harvested or made in Alberta;
- Ensures that a thriving local food sector continues to build on the strengths of the Province's agriculture and food industry which includes a highly productive land base, diversity of crops, livestock and agricultural products, innovative and dedicated producers and processors of all sizes and an effective network of distributors, retailers, restaurateurs and other sales venues; and
- Encourages that the local food sector is supported by increased consumer awareness and effective assurance systems.

Click [here](#) to learn more about the Act.

Cutting Red Tape

Alberta Agriculture and Forestry is helping farmers stay competitive in the agri-business by modernizing rules, reducing red tape and creating new research opportunities. During this reporting period, AF has achieved the following:

- **Agriculture Financial Services Corporation (AFSC) lending mandate:** implemented the AFSC lending mandate that was approved in January 2018, which will provide assistance to agriculture processors, producers and agri-businesses. This includes establishing an agribusiness lending group to work with agricultural processors
- **Public land leases:** extended public land leases to a maximum of 20 years, in order to give long-term certainty to ranchers with exemplary stewardship.
- **Agricultural Disaster Recovery Program funding:** enabled the option to use Canadian Land Inventory rates in lieu of requiring quotes for calculating agricultural Disaster Recovery Program funding for land restoration. The change speeds up the process and helps landowners who have difficulty obtaining quotes.
- **Financial assistance for agriculture producers:** shifted the mandate of the AFSC to providing financial assistance to young and new producers, developing producers, agri-food processors and agri-businesses.

Click [here](#) to learn more about AF's continued efforts in cutting red tapes for farmers and ranchers.

Alberta Approved Farmers' Markets

AF has managed and administered the Alberta Approved Farmers' Market Program since 1974. The program provides an operational framework which gives direction and guidance to those markets choosing to be a part of it. Through an application process and ongoing monitoring, AF ensures that approved farmers' markets are meeting minimum

operational standards. Individual markets are encouraged to set standards over and above the minimums by striving to incorporate best practices and in keeping up with their established values.

AF staff provide resources and training for new and existing farmers’ market managers, boards and vendors throughout the Province, sharing regulatory, business and best practice information to assist the markets and vendors in becoming more successful.

Since 2010, there has been a significant growth in the number of Alberta approved farmers’ markets across the Province. More communities (both urban and rural) are interested in having a market that provides more outlets for producers to sell their products. Table 1 shows the total number of farmers’ markets in Alberta by Land Use Framework regions.

The total number of market days are the number of days each market was open in a given year. Each market must be open for a minimum of 10 days per year and operate at least two hours per market day. The majority of markets continue to be seasonal with typical operations occurring between May and October. In the South Saskatchewan region, the Calgary Farmers’ Market operates four days per week year-round with the other markets in the region being seasonal. The Calgary Farmers’ Market is planning to open a second facility in northwest Calgary in 2021 to extend the opportunity to more producers.

Alberta approved farmers’ markets are required to maintain a minimum of ten vendors per week. Six farmers’ markets in the South Saskatchewan region average more than 50 vendors each week. The Millarville Farmers’ Market, operated by the Millarville Racing and Agricultural Society, is the largest farmers’ market in the South Saskatchewan region, averaging 147 vendors per week in 2019. This outdoor market attracts crowds of over 2,600 each week totaling more than 49,000 customers for the season plus an additional 22,000 over the course of their four-day Christmas market.

Farm Cash Receipts and Trade Balance

Farm Cash Receipts (FCR) represent revenues from the sale of agricultural commodities, program payments from government agencies, and payments from private crop and livestock insurance programs. Receipts are recorded in the calendar year in which the money is paid to farmers. All inter-farm sales within the Province are excluded; however, farm-to-farm sales between provinces are included. FCR are estimated using both administrative and survey sources of data.

In 2019, Alberta’s FCR from agricultural products totaled approximately \$14.84 billion, which was slightly higher than the 2018 value. The value of FCR for the South Saskatchewan region totaled \$5.7 billion in 2019, accounting for 38.4 per cent of the provincial total. See Table 2 for annual total value and per cent of FCR for Alberta as well as each Land Use Framework region. In 2019, Alberta’s international exports of primary and processed agricultural and agri-food products amounted to approximately \$11.65 billion, a 2 per cent decrease from \$11.89 billion in 2018. In 2019, Alberta also saw a slight reduction in the sector’s trade balance (the value of exports minus the value of imports), reporting an \$8.21 billion surplus compared to that of \$8.63 billion in 2018. See Table 3 for Alberta’s annual trade balance.

Table 1: Number and Markets and Number of Market Days of Alberta Approved Farmers’ Markets by Land-use Framework Region

| Year | Alberta | | South Saskatchewan | | North Saskatchewan | | Red Deer | | Upper Peace | | Upper Athabasca | | Lower Peace | | Lower Athabasca | |
|---|-------------------|-----------------------|--------------------|-----------------------|--------------------|-----------------------|-------------------|-----------------------|-------------------|-----------------------|-------------------|-----------------------|-------------------|-----------------------|-------------------|-----------------------|
| | Number of Markets | Number of Market Days | Number of Markets | Number of Market Days | Number of Markets | Number of Market Days | Number of Markets | Number of Market Days | Number of Markets | Number of Market Days | Number of Markets | Number of Market Days | Number of Markets | Number of Market Days | Number of Markets | Number of Market Days |
| 2015 | 130 | 3,481 | 25 | 608 | 50 | 1,499 | 23 | 425 | 7 | 288 | 17 | 425 | 3 | 72 | 5 | 164 |
| 2016 | 135 | 3,497 | 30 | 663 | 51 | 1,513 | 22 | 409 | 7 | 281 | 16 | 401 | 3 | 51 | 6 | 179 |
| 2017 | 135 | 3,566 | 28 | 691 | 54 | 1,550 | 21 | 397 | 8 | 296 | 16 | 410 | 3 | 54 | 5 | 168 |
| 2018 | 140 | 3,569 | 27 | 688 | 57 | 1,561 | 20 | 391 | 11 | 340 | 16 | 413 | 3 | 55 | 5 | 169 |
| 2019 | 141 | 3,586 | 25 | 540 | 59 | 1,622 | 21 | 394 | 10 | 335 | 18 | 450 | 3 | 63 | 5 | 182 |
| Source: Estimates prepared by Business Development and Programs Branch, Processing, Trade and Intergovernmental Relations Division, AF. | | | | | | | | | | | | | | | | |

Table 2: Alberta’s Annual Total Farm Cash Receipts (\$ billion) by Land Use Framework Region.

| Year | Alberta | | South Saskatchewan | | North Saskatchewan | | Red Deer | | Upper Peace | | Upper Athabasca | | Lower Peace | | Lower Athabasca | |
|--|---------|------|--------------------|------|--------------------|-------|----------|------|-------------|-----|-----------------|-----|-------------|-----|-----------------|------|
| | \$\$ | % | \$\$ | % | \$\$ | % | \$\$ | % | \$\$ | % | \$\$ | % | \$\$ | % | \$\$ | % |
| 2015 | 13.55 | 100 | 5.25 | 38.7 | 3.18 | 23.5 | 2.48 | 18.3 | 0.95 | 7.0 | 0.70 | 5.2 | 0.22 | 1.6 | 0.12 | 0.9 |
| 2016 | 13.50 | 100 | 5.17 | 38.3 | 3.10 | 23.0 | 2.45 | 18.2 | 0.99 | 7.3 | 0.69 | 5.1 | 0.28 | 2.1 | 0.12 | 0.9 |
| 2017 | 14.11 | 100 | 5.20 | 36.9 | 3.33 | 23.60 | 2.66 | 18.9 | 1.00 | 7.1 | 0.75 | 5.3 | 0.29 | 2.1 | 0.12 | 0.8 |
| 2018 | 13.57 | 100 | 5.05 | 37.2 | 3.17 | 23.4 | 2.53 | 18.6 | 1.03 | 7.6 | 0.77 | 5.7 | 0.27 | 2.0 | 0.13 | 1.0 |
| 2019 | 14.84 | 100* | 5.70 | 38.4 | 3.41 | 23.0 | 2.77 | 18.7 | 0.92 | 6.2 | 0.70 | 4.7 | 0.22 | 1.5 | 0.13 | 0.85 |
| * Program payments – 6.72 per cent. Source: Economics and Competitiveness Branch, AF based on Statistics Canada data | | | | | | | | | | | | | | | | |

Table 3: Alberta’s Annual Agriculture and Agrifood Trade Value (\$ billion).

| Reporting Year | Total Exports | Total Imports | Trade Balance |
|---|---------------|---------------|---------------|
| 2015 | 10.18 | 3.08 | 7.10 |
| 2016 | 10.01 | 3.05 | 6.95 |
| 2017 | 11.73 | 3.22 | 8.51 |
| 2018 | 11.89 | 3.26 | 8.63 |
| 2019 | 11.65 | 3.44 | 8.21 |
| Source: Economics and Competitiveness Branch, AF, based on Statistics Canada data | | | |

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Strategy 1.5

Support and enhance the next generation of agricultural, food and rural entrepreneurs

Supporting new generations of agricultural, food, and rural entrepreneurs is important to the continued vitality, growth and diversification of the agriculture sector. Currently, more farmers are retiring than entering the agriculture industry, and competing career opportunities are resulting in consolidation of farms and declining populations in rural Alberta. Alberta Agriculture and Forestry (AF) monitors census data on farm population and average age of farm operators, and puts efforts into attracting new entrants into agriculture and agrifood industries by offering support specific to their needs. These supports include government-funded loan programs, training and enhanced extension services. The following information provides a brief overview of AF’s work in support of Strategy 1.5 in the South Saskatchewan Regional Plan.

Beginning Farmer Incentive

Beginning Farmer Incentive is a unique feature of the Alberta Farm Loan Program. This incentive offers an interest rate reduction of 1.5 per cent for the first five years of the loan and is available to any qualifying individual with net assets of \$500,000 or less at the time of application. An individual can receive the interest reduction incentive on a loan of up to \$500,000. A couple, applying jointly, could receive the interest reduction incentive on up to a \$1 million loan, provided both have an individual net worth of \$500,000 or less at the time of application. Table 1 shows the number of Beginning Farmer Incentive recipients in Alberta as a whole as well as by Land Use Framework regions.

Table 1: Alberta Beginning Farm Loan Incentive Recipients by Land Use Framework Region

| Year | Alberta | South Saskatchewan | North Saskatchewan | Red Deer | Upper Peace | Upper Athabasca | Lower Peace | Lower Athabasca |
|------|---------|--------------------|--------------------|----------|-------------|-----------------|-------------|-----------------|
| 2013 | 799 | 121 | 281 | 165 | 80 | 74 | 63 | 15 |
| 2014 | 699 | 116 | 233 | 150 | 66 | 63 | 59 | 12 |
| 2015 | 677 | 117 | 208 | 149 | 66 | 76 | 51 | 10 |
| 2016 | 585 | 88 | 169 | 131 | 82 | 57 | 50 | 8 |
| 2017 | 429 | 70 | 144 | 78 | 47 | 38 | 40 | 12 |
| 2018 | 522 | 77 | 178 | 107 | 49 | 48 | 50 | 13 |
| 2019 | 793 | 144 | 238 | 193 | 87 | 69 | 49 | 13 |

Source: Agriculture Financial Services Corporation

Farm Operators’ Age Demography

The definition of farm operators includes those who are responsible for the management decisions regarding an agricultural operation. Farm operators can be owners, tenants or hired managers of the agricultural operation, including those responsible for management decisions pertinent to particular aspects of the farm such as planting, harvesting, raising animals, marketing and sales, and making capital purchases and other financial decisions. Not included in the definition are accountants, lawyers, veterinarians, crop advisors, herbicide consultants, and others who make recommendations affecting the agricultural operation but are not ultimately responsible for management decisions. AF monitors the average age of Alberta’s farm operators by analyzing Statistics Canada’s Census of Agriculture data. This can be used to make informed decisions on the future need for programs in Alberta to attract new entrants and to keep existing generations in agriculture, agrifood and agribusiness.

Tables 2a, 2b and 2c show comparisons between 2011 and 2016 census data and the relative change in the number of farm operators in three different age groups. In 2016 census year, compared to 2011, the number of farm operators in the age group of 35 – 54 declined by 25 per cent while that for the age group of under 35 and over 55 increased by 8 per cent and 6 per cent, respectively.

Table 2d shows that age demographics of farm operators varied slightly across the Land Use Framework regions. In 2016, the average age of farm operators ranged from 51.0 years in Lower Peace to 56.6 years in Lower Athabasca, with the provincial average at 55.7 years compared to 54.5 in 2011. Regional average age data is not available for 2011.

Table 2a: Alberta Farm Operators: Under 35 Year Old

| Census Year | Alberta | South Saskatchewan | North Saskatchewan | Red Deer | Upper Peace | Upper Athabasca | Lower Peace | Lower Athabasca |
|--|----------------|---------------------------|---------------------------|-----------------|--------------------|------------------------|--------------------|------------------------|
| 2011 | 4,550 | 1,045 | 1,330 | 995 | 460 | 450 | 250 | 95 |
| 2016 | 4,910 | 1,185 | 1,415 | 1,145 | 455 | 410 | 210 | 90 |
| Change (%) | 7.9 | 13.4 | 6.4 | 15.1 | -1.1 | -8.9 | -16.0 | -5.3 |
| Source: Statistics Canada, Census of Agriculture, Tables 32-10-0442-01 | | | | | | | | |

Table 2b: Alberta Farm Operators: 35 - 54 Year Old

| Census Year | Alberta | South Saskatchewan | North Saskatchewan | Red Deer | Upper Peace | Upper Athabasca | Lower Peace | Lower Athabasca |
|--|----------------|---------------------------|---------------------------|-----------------|--------------------|------------------------|--------------------|------------------------|
| 2011 | 26,720 | 6,095 | 8,445 | 5,500 | 2,385 | 2,895 | 810 | 615 |
| 2016 | 20,155 | 4,530 | 6,375 | 4,225 | 1,750 | 2,155 | 655 | 465 |
| Change (%) | -24.6 | -25.7 | -24.5 | -23.2 | -26.6 | -25.6 | -19.1 | -24.4 |
| Source: Statistics Canada, Census of Agriculture, Tables 32-10-0442-01 | | | | | | | | |

Table 2c: Alberta Farm Operators: age 55 Years and Over

| Census Year | Alberta | South Saskatchewan | North Saskatchewan | Red Deer | Upper Peace | Upper Athabasca | Lower Peace | Lower Athabasca |
|--|----------------|---------------------------|---------------------------|-----------------|--------------------|------------------------|--------------------|------------------------|
| 2011 | 30,785 | 7,065 | 10,285 | 6,030 | 2,625 | 3,465 | 615 | 720 |
| 2016 | 32,535 | 7,635 | 10,730 | 6,700 | 2,590 | 3,505 | 620 | 755 |
| Change (%) | 5.7 | 8.1 | 4.3 | 11.1 | -1.3 | 1.2 | 0.8 | 4.9 |
| Source: Statistics Canada, Census of Agriculture, Tables 32-10-0442-01 | | | | | | | | |

Table 2d: Alberta Farm Operators: Average Age (Years)

| Census Year | Alberta | South Saskatchewan | North Saskatchewan | Red Deer | Upper Peace | Upper Athabasca | Lower Peace | Lower Athabasca |
|--|----------------|---------------------------|---------------------------|-----------------|--------------------|------------------------|--------------------|------------------------|
| 2011 | 54.5 | - | - | - | - | - | - | - |
| 2016 | 55.7 | 55.7 | 56.3 | 55.1 | 54.8 | 56.5 | 51.0 | 56.6 |
| Change (%) | 2.2 | - | - | - | - | - | - | - |
| Source: Statistics Canada, Census of Agriculture, Tables 32-10-0442-01 and custom data | | | | | | | | |

Green Certificate Program

The Green Certificate Program (GCP) facilitates the entrance of secondary school graduates either directly into the agriculture workforce or into post-secondary agricultural studies. The GCP focuses on workforce development in the primary agriculture production sector. The program assists in the development of a skilled, safe and trained agricultural labour workforce. AF works in partnership with the agriculture industry and Alberta Education (via the off campus education policy) to offer the GCP to all young Albertans. Annually, AF provides \$362,000 for operational costs while Alberta Education provides up to \$400,000 for testing students for the GCP. The program is delivered in partnership with the Province’s four agriculture colleges (Grande Prairie Regional College, Lakeland College, Olds College, Lethbridge College), as one of Alberta Education’s Off-campus Programs of Study. The GCP offers apprenticeship style training in 11 primary production training specialties including beekeeping, cow-calf beef, swine farrow to finish, dairy, poultry, sheep, feedlot, equine, greenhouse, and field crops and irrigated crops. The GCP is a self-directed study program; depending on the competency level and time commitment, students can take up to three years to graduate. Table 3 shows the number of institutes that offered GCP, the number of students enrolled, and the number of students graduated in Alberta as well as by Land Use Framework regions.

Table 3: Green Certificate Training Program by Land Use Framework Region

| Year | Alberta | | South Saskatchewan | | North Saskatchewan | | Red Deer | | Upper Peace | | Upper Athabasca | | Lower Peace | | Lower Athabasca | |
|-----------------------------|-------------------|-------------------|--------------------|-------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | Number of Schools | Students Enrolled | Number of Schools | Students Enrolled | Number of Schools | Students Enrolled | Number of Schools | Students Enrolled | Number of Schools | Students Enrolled | Number of Schools | Students Enrolled | Number of Schools | Students Enrolled | Number of Schools | Students Enrolled |
| 2014-2015 | 183 | 681 | 63 | 298 | 52 | 158 | 37 | 144 | 14 | 50 | 9 | 18 | 5 | 10 | 3 | 3 |
| 2015-2016 | 187 | 642 | 63 | 232 | 60 | 181 | 30 | 118 | 12 | 65 | 12 | 22 | 6 | 10 | 4 | 14 |
| 2016-2017 | 202 | 632 | 77 | 244 | 57 | 136 | 38 | 154 | 11 | 58 | 13 | 27 | 4 | 10 | 2 | 3 |
| 2017-2018 | 194 | 612 | 68 | 223 | 53 | 131 | 37 | 156 | 15 | 55 | 13 | 28 | 5 | 13 | 3 | 6 |
| 2018-2019 | 186 | 716 | 61 | 217 | 57 | 170 | 49 | 201 | 20 | 59 | 9 | 24 | 15 | 23 | 1 | 1 |
| 2019-2020 | 211 | 697 | 63 | 209 | 51 | 133 | 47 | 181 | 22 | 91 | 17 | 52 | 7 | 24 | 4 | 7 |
| Total Graduated (2014–2020) | 2183 | | 854 | | 403 | | 543 | | 323 | | 83 | | 67 | | 10 | |

Source: Estimates prepared by Business Development and Programs Branch, AF.

Strategy 1.6

Encourage the use of voluntary market-based instruments for ecosystem services in order to recognize and reward the continued stewardship and conservation of private agricultural land and potentially diversify the agricultural economy.

Alberta Agriculture and Forestry (AF) supports Strategy 1.6 in the South Saskatchewan Regional Plan by providing financial, professional and technical support to multi-stakeholder research projects to develop voluntary market based instruments for ecosystem services. Following are a few projects supported by AF in the recent years that directly or indirectly contribute to ecosystem services in Alberta.

Ecosystem Services Assessment for Environmental Innovation in Alberta (2012-2015)

This project was led by Alberta Biodiversity Monitoring Institute and funded by AF in partnership with Alberta Innovates. The objectives of this project were to integrate existing ecosystem service information, create new ecosystem service knowledge to fill priority gaps, map ecosystem service supply and demand, and to develop three innovative ecosystem service applications for the livestock sector. The project developed models for six ecosystem services including biodiversity, rangeland health and productivity, water quality and purification, carbon sequestration of rangeland, timber production and forest carbon sequestration, and pollination by wild pollinators. Each model operates at the scale of one of Alberta's seven major watersheds corresponding to seven Land-use Framework regions. Click [here](#) to learn more about this initiative.

Soil Quality as a Fundamental Contributor to Ecosystem Health: Developing a Quantitative, Rapid Method for Accurate Diagnosis (2014-2016)

The long-term objective of this project was to derive deployable, effective tools for examining and identifying the quality, function, and productivity of soils under various farming systems. This project was led by the University of Alberta and funded by AF. This project demonstrated that Beneficial Management Practices (BMPs) such as complex rotations including perennial grasses and legumes that improved soil quality also resulted in higher crop productivity.

Development of Information and Science to Support the Provision of Ecosystem Services on Agricultural Lands (2015-2019)

The objective of this project was to develop and test integrated science and decision support tools to support the design and evaluation of ecosystem services programs. The programs include biodiversity, water quality and quantity, carbon, and wetlands. This was a collaborative research project funded by Alberta Innovates and AF. This project was aimed at working towards building a model which highlights the impacts of adoption of BMPs within a sub-watershed as well as identifying the costs related to adoption. Identifying both the ecological and economic impacts and costs, this project studied an approach that is likely to succeed and support ecological outcomes in a market-based way with private landowners. Click [here](#) to learn more about this project.

Nutrient Beneficial Management Practices Evaluation (2006-2012); Alberta Phosphorus Watershed Project (2013-2023)

AF completed the six-year Nutrient Beneficial Management Practices Evaluation project, which had objective to evaluate the environmental and economic efficacy of BMPs at the field and watershed scales. The project used the Comprehensive Economic and Environmental Optimization Tool (CEEOT) as a model and included the Indianfarm Creek Watershed in the South Saskatchewan Region. Additional information on this project can be found [here](#). More information on BMPs on livestock, crops and farmstead operations can be found [here](#).

With successful completion of this project, AF and the Intensive Livestock Working Group initiated the Alberta Phosphorus Watershed Project to determine the cumulative effects of BMPs for nutrient management in Alberta's agricultural watersheds. This project includes the Acme Creek Watershed in the South Saskatchewan Region. Additional information on this project can be found [here](#). AF's water quality related projects are compiled [here](#).

Beneficial Management Practices (BMP) Cost Model for Alberta (2019-2020; ESB-047678)

AF is supporting this project in collaboration with Innotech Alberta, Northern Alberta Institute of Technology, and University of Guelph by providing a grant of \$200,000. The objective of this project is to develop a BMP cost model for Alberta to evaluate the cost-effectiveness of agricultural BMPs for water quality, water storage, biodiversity, and carbon storage. This model will work together with another model - Integrated Modelling for Watershed Evaluation of BMPs – developed at the University of Guelph. This project will also leverage the Modeste Natural Infrastructure project in the North Saskatchewan region that is being funded by Innotech Alberta, Alberta Environment and Park and Alternate Land Use Services Canada.

Revisiting the Soil Quality Benchmark Sites to Assess the Effects of Agronomic Practices on Soil Biology as it relates to Physicochemical Parameters and a Quality Index (2019-2022)

The Alberta Environmentally Sustainable Agriculture (AESA) soil quality benchmark sites include all agricultural regions of Alberta, with annual autumn soil sampling of each site from 1997 until 2007. The AESA Soil Quality Program dataset has established a baseline for determining agricultural soil quality across the Province which can be used to test and validate simulation models. This program has created an opportunity to increase public awareness of the environment and the effect of agricultural practices on the below-ground ecosystem. These benchmark sites have also created a valuable database and resource from which the long-term effects of landscape, ecoregion, and agronomic practices on soil quality can be evaluated at a provincial scale.

The current project will re-examine physico-chemical properties and add biological data which will enhance the long-term monitoring and assessment of the influence of various agricultural practices on soil quality across the Province. This project will re-evaluate archived soils for organic matter stability and compare to contemporary soils to determine soil quality changes in the context of inputs and yields.

Click [here](#) to learn more about the AESA background.

Beneficial insects in Prairie crops: quantifying the value and vulnerability of biological pest control (2020- 2022)

The main objective of the project is to provide farmers with information on value and vulnerability of beneficial insects. This project will focus on the economic and ecological contributions of biocontrol by beneficial insects. In the end, the project will provide an assessment of the economic value of beneficial insects and the direct or indirect effects of insecticides. The project outcomes will also include a summary of the time of year and the growth stage of crops during when beneficial insects are active and vulnerable to insecticide use, with an emphasis on wheat and canola. This information will be used to develop models of selected beneficial insects to predict critical times of vulnerability in different Prairie locations. Click [here](#) to learn more about this project.

Insect biodiversity and pest management in perennial grass and legume seed production (2020-2022)

The main objective of this project is to provide crop farmers with information on insect biodiversity and pest management in perennial grass and legume seed production systems. The project will characterize the seasonal distribution and diversity of insects occurring in perennial stands of commercial grass and clover grown for seed in the Peace River region. In addition, the project will assess the increased presence and control methods for emerging pests insects causing damage in grass and legume seed production.

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Strategy 1.9 & 1.10

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- 1.9 Ensure policies are in place to promote and remove barriers to **new investments in renewable energy** (that is, wind, biofuels, solar, hydro) production.*
- 1.10 Invest in the development, demonstration and deployment of **renewable and alternative energy technologies** targeted to improve Alberta’s overall energy efficiency. This will include support for the application of new technologies and support on-going research and development in partnership with other institutions.*
-

Under Strategy 1.9 and 1.10 in the South Saskatchewan Regional Plan, Alberta Agriculture and Forestry (AF) promotes the use of renewable and alternative energy technologies through programs such as the Efficient Grain Dryer Program and the Irrigation Efficiency Program. AF also supported programs such as On-Farm Energy Management Program and On-Farm Solar Photovoltaics Program in the past. In 2020, [Emissions Reduction Alberta](#) (ERA) has announced grants of a total value of \$40 million to the food, farming and forest industry stakeholders. ERA will fund up to \$5 million per project and up to 50 per cent of total project costs with exceptions where applicable. Funding is being sourced from the carbon price paid by Large Final Emitters in Alberta through Alberta’s Technology Innovation and Emissions Reduction (TIER) fund. This funding opportunity will accelerate innovation in support of emissions reduction, in addition to creating opportunities and solutions for longer term economic recovery, investment attraction, and job creation. Click [here](#) to learn more about this announcement.

On-Farm Energy Management Program (ended on May 30, 2019)

AF’s On-Farm Energy Management Program is designed to help producers conserve energy and reduce carbon emissions. In the 2018-19 fiscal year it was funded by the Climate Leadership Plan, was open to any Alberta producer, and offered cost-sharing incentives (grant: 50 per cent; applicant: 50 per cent) up to \$250,000 on the purchase of equipment that improved an operation's energy efficiency. Iterations of the program go back to 2009. Some examples of projects funded under this program are as follows:

- A greenhouse in the Medicine Hat area installed energy curtains and thermal energy storage which is expected to result in ~35,100 tons of Green House Gas (GHG) emission reduction over the life of the project.
- A greenhouse near Lethbridge installed a combined heat and power generation unit for on-farm energy needs which is expected to result in ~14,400 tons of GHG emission reduction over the life of the project.
- A Hutterite colony near Drumheller installed lighting and insulation in a new workshop building that is expected to result in ~5,850 tons of GHG emission reduction over the life of the project.
- A potato storage building near Taber improved ventilation system that is expected to result in ~4,140 tons of GHG emission reduction over the life of the project.

On-Farm Solar Photovoltaics Program (ended on May 30, 2019)

The On-Farm Solar Photovoltaics Program was launched in February 2016 and continued till March 2018 under Growing Forward 2 (GF2). In the 2018-19 fiscal year it continued as a provincial program under the Climate Leadership Plan.

Under GF2, it was a \$1.5 million per year initiative that offered up to \$50,000 (45 cents per watt) to producers for incorporating solar panels into their operation. Under the Climate Leadership Plan, it had \$3.5 million per year and offered up to \$100,000 (75 cents per watt). Indicators for the On-Farm Solar Photovoltaics Program included how many solar systems were installed (101 in fiscal 2018-19), how many kilowatts of power were installed (3600 kilowatts in 2018-19), and calculated carbon offsets (2,786 tons per year for the 20-year life of the system) resulting from solar power that displaced grid power.

Efficient Grain Dryer Program

The Efficient Grain Dryer Program, launched in February 2020 under the Canadian Agricultural Partnership (CAP), has a budget of \$2 million per year. Its objective is to help producers improve their energy efficiency when drying grain and to conserve energy, thereby cutting input costs. The program assists producers with the purchase of grain dryer components that improve the energy efficiency of the drying system. Purchased components can be part of a new dryer, or can be

retrofitted onto an existing dryer. Components eligible under the program include enclosed dryer roofs, insulated plenums, heat exchangers and moisture monitoring cables, among others. Eligible expenses are cost shared at a rate of 50/50, up to a grant maximum of \$250,000 per applicant. The program is open to any Alberta producer.

[Irrigation Efficiency Program](#)

The Irrigation Efficiency Program that has been continued under the Canadian Agricultural Partnership has a tentative budget of \$2.5 million in 2019/20, an increase from 1.5 million per year under Growing Forward 2. Its objective is to help producers improve their energy and water usage through better irrigation equipment which increases the sustainability of water resources on their operations. The program assists producers with the purchase of new low pressure center pivot irrigation systems or with upgrades of existing high pressure center pivot irrigation systems. Under the Climate Leadership Plan, the program was allocated \$4 million per year. Eligible upgrades included modern electronic control panels, variable-rate irrigation technologies, high-efficiency sprinkler nozzles, and drip irrigation. The program was open to irrigation producers in Alberta who completed Long-Term Irrigation Management Plan. Funding provided was 40 per cent of the cost of eligible equipment upgrades to a maximum of \$5,000, or \$15,000 for an upgrade from a gravity or side-wheel irrigation system to a new low pressure center pivot system. In the 2019/20 program year, the program achieved water savings of almost 7 million cubic meters, electricity savings of 1,196 megawatt-hours, and natural gas savings of 17,750 gigajoules. This equates to avoiding 1,629 tons per year of greenhouse gas, in carbon dioxide equivalents.

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Strategy 3.15

*Encourage and support the continued stewardship of Alberta’s private lands through the **development and piloting of regionally appropriate conservation tools**. These tools may include exploring market-based options, voluntary conservation easements and the provision of other government and/or private sector incentives that assist in achieving environmental outcomes. This will be done within the provincial approach for management of ecosystem services.*

Alternative Land Use Services

Alberta Agriculture and Forestry (AF) works with Alternative Land Use Services (ALUS) Partnership Advisory Committees and municipal ALUS coordinators to develop conservation prioritization tools to provide decision support for ecosystem services projects. AF also provides training to enable the extension of these tools as ALUS expands in the Province. In addition to previous work in the Red Deer and North Saskatchewan Region, AF is currently working with county ALUS coordinators and Partnership Advisory Committees in the South Saskatchewan and North Saskatchewan regions to develop municipal, GIS-based decision support tools to assist with prioritization of conservation projects for ecosystem services. Click [here](#) to learn more about ALUS initiatives in Alberta.

Life Cycle Assessments for Environmental Sustainability

Increasingly, retailers and processors are seeking greater transparency and accountability on environmental sustainability and reporting from their suppliers. AF is committed to ensuring that Alberta’s agricultural producers remain competitive, adaptive and responsive in the marketplace. AF, in collaboration with the agricultural commodity groups, has developed a Life Cycle Assessment (LCA) tool to better understand and quantify the environmental impacts of Alberta agri-food industries. LCA is an internationally-recognized, scientifically validated system of analysis and is framed by the ISO methodology (ISO 14040). LCA is endorsed by the United Nations Environment Program (UNEP) and by members of The Sustainability Consortium (TSC) including Walmart, McDonald’s and PepsiCo. LCA measures a variety of impact category indicators (Carbon Footprint, Water Footprint, Ecosystem Quality, Resources and Human Health) that are used to measure environmental footprint sustainability. The LCA results provide a framework that can be used to support a variety of initiatives, such as:

- Benchmark and monitor environmental performance over time;
- Measure the overall sector improvement resulting from beneficial management practices adoption; and
- Engage and communicate with clients and stakeholders on sustainability.

To learn more about LCA in agriculture, its potential applications, social licence and market access, visit the LCA project [report](#) funded by Growing Forward 2.

After completing LCA for Alberta’s egg, chicken, canola, and potato industries, AF has recently completed LCA with the Alberta Pulse Growers to measure the environmental footprint of Alberta peas. A combined health and environmental benefits of pulses study has also been completed resulting in evidence that pulses provide a significant proportion of our daily nutritional needs and has a low carbon footprint. This work has placed Alberta Pea as the first agri-food commodity to have a certified Environmental Product Declaration (EPD) in North America. This supports Alberta Pulse Growers with a powerful business and marketing tool to communicate in a credible and transparent way to its stakeholders about the environmental impact of pea production. Click [here](#) to view Alberta Pulse Growers’ EPD.

AF continues to build capacity in this area and is currently leading and supporting industry LCA sustainability initiatives with the Canadian Roundtable for Sustainable Beef and Alberta Beef Producers. Click [here](#) for more information on LCA.

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Strategy 3.16

Complete development and evaluation of the Southeast Alberta Conservation Offset Pilot by the end of 2015.

Offsets are enabled under the *Alberta Land Stewardship Act* and identified in the South Saskatchewan Regional Plan as an approach to meet conservation and stewardship outcomes in this region. Alberta Agriculture and Forestry delivered on Strategy 3.16 in the South Saskatchewan Regional Plan by leading and completing a multi-stakeholder pilot project, the *Southeast Alberta Conservation Offset Pilot (SEACOP)*. The SEACOP was created to test a voluntary, market based approach to address temporary industrial impacts on southeastern Alberta native prairie. Click [here](#) to learn more about this project and to view the final project report.

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Strategy 3.17

*Develop and facilitate the continued voluntary adoption of **Beneficial Management Practices that demonstrate agriculture and agri-food sector commitment to environmental stewardship**. Implementation of programs such as the Environmental Farm Plan and/or Federal-Provincial-Territorial agricultural policy frameworks (i.e., Growing Forward 2) helps producers identify environmental risks associated with their operations and encourages the adoption of Beneficial Management Practices (BMP) to address those risks. Continued extension, education and publication of information (including BMP manuals) increases awareness and provides many resources for private landowners who may be interested in implementing BMPs.*

Alberta Agriculture and Forestry (AF) supports Beneficial Management Practices (BMPs) through grant programs under Federal-Provincial-Territorial initiatives and tracks the implementation of BMPs by a biannual Environmentally Sustainable Agriculture Tracking Survey.

Environmentally Sustainable Agriculture Tracking Survey

The Environmentally Sustainable Agriculture (ESA) Tracking Survey is conducted every two years for the purpose of providing data for AF’s Performance Measure 3a (from AF’s 2016-2019 Business Plan) – which is defined as *‘the average percentage of improved environmentally sustainable agriculture practices adopted by producers’* – and as an information source for AF program and service decision makers. The most recent survey was completed in 2018 and the survey completed prior that was in 2016. The 2016 provincial adoption score average was 53 per cent and remained approximately the same in 2018. Table 1 compiles the 2014, 2016 and 2018 survey results showing scores on adoption of ESA practices by agricultural producers. A total of 40 ESA practices, that could be used to address soil conservation, water quality, grazing management, wildlife habitat conservation, energy and climate change (adaptation), manure management, agricultural waste management, as well as planning approaches regarding sustainable agriculture, were used to derive the result for this measure. An eligible ESA practice for the base calculation is based on farm type, farm site characteristics and operation practices. The percentage of all eligible environmentally sustainable agricultural practices adopted by each respondent is multiplied by a weighting factor to generate a weighted adoption score for each respondent. Practices which achieve a high level of adoption (90+ per cent) are removed from subsequent surveys as the focus is on continuous improvement.

The survey targets 500 respondents from five regions across Alberta (South, Central, Northwest, Northeast and Peace). The survey regions do not directly align with the LUF regions although there is a good portion that overlaps. Sample sizes in some regions are too small which limits the relevance of the results by LUF regions. Thus, these scores are to be interpreted with caution when assigned under LUF regions.

Table 1: Bi-annual Environmentally Sustainable Agriculture Tracking Survey Scores (per cent) by Land Use Framework Region

| Year | Province/ Region | Number of Respondents | Focus Area | | | | | | | |
|------|------------------------|--------------------------|----------------------|-----------------------------------|-----------------------|-------------------------------------|----------------------|-------------------------------------|------------------------------------|----------------------|
| | | | Soil Conservation | Water Quality & Quantity | Grazing Management | Wildlife Habitat Conservation | Manure Management | Agricultural Waste Management | Energy and Climate Change | General Practices |
| 2014 | Alberta | 500 | 21 | 75 | 70 | 70 | 76 | 41 | 23 | 44 |
| 2016 | Alberta | 500 | 21.8 | 74.1 | 70.9 | 73 | 69.4 | 53.4 | 16 | 42.4 |
| | South Saskatchewan. | 142 | 37 | 79 | 75 | 52 | 66 | 36 | 19 | 53 |
| 2018 | Alberta | 500 | 27.7 | 74.7 | 69.6 | 73.9 | 71.1 | 51.6 | 15 | 36 |
| | South Saskatchewan. | 146 | 30.7 | 73.5 | 69.9 | 61 | 70.1 | 55.4 | 15.5 | 39.7 |
| | Red Deer | 52 | 26.1 | 79.7 | 63.3 | 82.3 | 73.5 | 42.4 | 14.4 | 36.5 |
| | North Saskatchewan | 147 | 25.4 | 74.1 | 75 | 77.8 | 70.5 | 49.9 | 13.3 | 32.6 |
| | Upper Athabasca | 51 | 20 | 77.4 | 73 | 83.3 | 73.4 | 45.4 | 12.8 | 40.1 |
| | Upper Peace | 44 | 32.7 | 75 | 70.7 | 81.8 | 56.9 | 58.2 | 19.6 | 31 |
| | Lower Athabasca | 77 | 19.7 | 76.6 | 69 | 83.4 | 75.3 | 49.2 | 13.3 | 35.4 |
| | Lower Peace | 78 | 35.9 | 69.2 | 67.7 | 74.4 | 63.5 | 66.5 | 19.9 | 34.1 |

Source: AF Environmental Stewardship Branch

In the 2018 survey that obtained data on 2017 farming practices, 146 respondents were identified as part of the South Saskatchewan Region (SSR). The SSR showed an overall adoption score of 52.6 per cent, similar to the provincial average. The adoption score for soil conservation practices was 31 per cent, slightly higher than the provincial average of 28 per cent. In the area of general practices, which includes BMPs such as using variable rate technology, environmental farm plan, soil sampling and using trees for agriculture purposes, the SSR was 40 per cent compared to the provincial average of 36 per cent. Agricultural waste management score in the SSR was also higher than the provincial average. Practices related to water quality and quantity (score 73.5), grazing management (score 70), manure management (score 70), energy and climate change (score 15.5) in the SSR were more or less same as the provincial average (Table 1). Practices related to wildlife habitat conservation were lower in the SSR at 61 per cent versus 74 per cent provincial average.

The adoption score presents an average adoption of eligible practices. This methodology off-sets the focus areas achieving highly adopted practices (80 per cent or greater) with focus areas that have low adoption (less than 50 per cent). The focus areas with lower results are often influenced in part by regional variability in environmental condition, limited rural agricultural product disposal sites or lower awareness of new and emerging technologies. AF focuses research and extension capacity and incentive-based programming towards improving the adoption of environmentally sustainable agricultural practices in areas with lower scores.

Federal-Provincial-Territorial Environmental Stewardship Grant Programs

The Federal-Provincial-Territorial Policy Framework - Growing Forward 2 (GF2) - ended in March 2018 and was followed by the Canadian Agricultural Partnership (CAP, 2018-2022). The GF2 was a five-year federal and provincial funding partnership that delivered provincially appropriate programs on a cost-shared basis. These programs were delivered by provinces and territories to meet regional needs. Most of these programs are being continued under the CAP.

The CAP Environmental Stewardship Grant Program is a producer-focused, voluntary grant program that shares cost with the producers in adopting BMPs to support environmental stewardship throughout the Province. These projects are capital intensive and require significant contributions from producers. Table 2 compiles BMP projects and their benefits and outcomes completed to date under the CAP. Table 3 & 4 list the BMP projects that were completed during the GF2 duration (2013-2018). Table 3 lists projects focusing BMPs in general, while Table 4 lists projects specific to confined-feeding operations.

Table 2. Beneficial Management Practices projects completed under the Canadian Agricultural Partnership (April, 2020 – June, 2020)

| Project Title | Number of Projects | Outcomes | Benefits |
|--|--------------------|---|--|
| | Alberta | | |
| Riparian Area Fencing and Management (101) | 47 | Better protection of 57 lakes/streams, 15 ponds, 28 rivers, 63 wetlands, 5 reservoirs/irrigation canals and 28 dugouts. | Manage livestock access around riparian areas; provide protection for aquatic life, riparian vegetation, wildlife habitat, and water quality. |
| Year-Round/Summer Watering Systems (102) | 50 | 161 watering systems installed. 4 fish bearing waters protected. 2 projects involving the protection of waterbodies that are navigable. | Wintering/remote watering systems support wintering feeding management, reduce the build-up and off-site transport of manure nutrients and pathogens, and provide greater protection of natural water sources. |
| Watercourse Crossings (103) | 3 | 3 watercourse/stream crossings established. | Manage livestock access across a watercourse by maintaining bank stability and reducing the time cattle spend in the waterbody reducing impacts on riparian areas and improve or maintain water quality. |
| Riparian Management Strategies (104) | 6 | Included pond levelers, grazing management consulting, improved rotational grazing. | Grazing management solutions. |
| Wetland and Riparian Assessment (105) | 1 | Rangeland heath assessment range management plan. | Assessment of wetlands and riparian areas to collect site information to evaluate potential solutions that will improve surface water management. |
| Engineering Investigation and/or | 6 | 3 Engineering investigation, 2 soil and 1 geotechnical assessment. | Collection of site information and evaluation of environmental risks and |

| | | | |
|--|-----|---|--|
| Feasibility Assessment (201) | | | evaluating potential solutions to minimize that risk and improve manure management. |
| Construction or Upgrade of a Surface Water Management System (202) | 7 | Improved manure storage capacity, and 6 surface water run-on/off controls constructed. | Surface water control systems to reduce run on of clean water into a livestock facility and control runoff from a livestock facility. |
| Improved Manure Storage Facility (203) | 9 | 3 improved storage capacity, 5 new manure lagoon facility, and 1 solid manure pad construction. | Improve existing manure storage facility that poses a water quality risk created by overflow or increased need of winter spreading. |
| Relocation of a Livestock Facility and Permanent Wintering Site or Confined Feeding Operation (204) | 9 | Relocations at least 30 meters away from a natural water source or environmental sensitive areas. | Relocate a livestock facility that poses a risk to water quality. |
| Improved Land Application of Manure (205) | 10 | Manure equipment purchased for better application of manure. | Adoption of technologies that result in more efficient nutrient used and decrease nutrient loss through runoff and volatilization. |
| Manure and Livestock Facilities Management Strategies (206) | 2 | Included compost windrow turner and manure spreader. | Manure management solutions that reduce the environmental risk from manure or livestock facility. |
| Improved Pesticide Management (301) | 24 | Pesticide and nutrient management technologies adopted. | Improved crop and pest monitoring reduce the amount of agrochemicals released into the environment. |
| Improved Nutrient Management (302) | 35 | Precision nutrient management practices implemented. | Increase fertilizer nutrient efficiency and minimize the loss of excess fertilizer nutrients from entering the environment and affecting water quality or contributing to greenhouse gas emissions. |
| Plastic Rollers and Compactors (303) | 8 | 5000 pounds managed by plastic rollers. Rolled plastic will be delivered to a recycle site through the Alberta Ag-Plastic Recycle It Program. | Rolling and compacting agricultural sheet plastics allow for more convenient and safe storage on farm prior to transportation to an approved recycling site. This practice will eliminate the need to dispose of plastics on farm. |
| Shelterbelts and Eco-Buffers (304) | 12 | 5649 meters established. | Support wintering feeding management, reduce manure nutrient build-up and protect water sources. |
| Agricultural Input and Waste Management Strategies (306) | 5 | Weedit system, rod weeder for organic farming, improved drift reduction, water recycling projects have been completed. | Agricultural inputs and waste management solutions that address and environmental risk or reduces the impacts of climate change. |
| Innovative Solutions (401) | N/a | N/a | Investigating or implementing solutions to reduce the risks of agricultural contaminants from enter water or soil resources. |
| Commercial Applicators – Improved Land Application of Manure (501) | 1 | Auto Inflation Tires, Compost turner and Vertical Beaters purchased. | Adoption of technologies that result in more efficient nutrient used and decrease nutrient loss through runoff and volatilization. |
| Commercial Applicators – Manure Management Strategies (502) | 0 | N/A | Manure management solutions that address an environmental water quality risk. |

Table 3: Beneficial Management Practices projects completed in the South Saskatchewan Region under the Growing Forward 2 Environmental Stewardship Grant Program (2013-2018)

| Project Title | Number of Projects | | Outcomes | Benefits |
|---|--------------------|---------------------------|--|--|
| | Alberta | South Saskatchewan Region | | |
| Innovative Stewardship Solutions (100) | 7 | 1 | Built 7 in-stream crossings for livestock to minimize riparian and aquatic impacts | Maintains bank stability and reduces the amount of time cattle spend in the waterbody. |

| | | | | |
|--|-----|-----|---|---|
| <i>Riparian Area Fencing and Management (101)</i> | 236 | 61 | Covered 66,502 acres of area including 43 wetlands, 80 ponds/lakes, 232 creeks/rivers and 59 dugouts. | Managing livestock around riparian areas provides protection for aquatic life, riparian vegetation and wildlife habitat, and water quality. |
| <i>Year-Round/Summer Watering Systems (102)</i> | 426 | 11 | Covered 83,835 acres of area with 33,635 animals, 51 wetlands, 51 ponds/lakes, 52 creeks/rivers and 156 dugouts. | Remote watering systems reduce the build-up and off-site transport of manure nutrients and pathogens, providing greater protection of water sources and riparian areas. |
| <i>Portable Shelters and windbreaks (103)</i> | 347 | 105 | Benefitted 37,831 animals. | Properly placed portable shelters and windbreaks help minimize the impact of livestock on the environment by reducing livestock density and spreading out feeding and bedding areas in the winter months. |
| <i>Wetland Restoration (104)</i> | 3 | 1 | Covered 5 acres per wetland restoration. | Restoration of natural wetlands improves water resources and wildlife habitat. |
| <i>Shelterbelt Establishment (105)</i> | 13 | 1 | Established 200 meters of shelterbelt. | Establishment of permanent shelterbelts supports winter-feeding management, reduces manure nutrient build-up and protects water sources. |
| <i>Improved Manure Storage Facilities (201)</i> | 1 | 1 | Achieved better management of the manure of at least 65 animals | Increasing manure storage capacity improves air quality (odors and flies) by reducing the number of times the manure is handled. |
| <i>Livestock Facility Runoff Control (202)</i> | 18 | 6 | Improved control for at least 8 water bodies. | Runoff controls improve water quality by decreasing the amount of sediment, pathogens and contaminants that enter the water system and prevents soil erosion. |
| <i>Livestock Facility and Permanent Wintering Site Relocation (203)</i> | 25 | 11 | Relocated 1,628 livestock to a minimum distance of 30m from at least 12 water bodies. | Distance from water bodies reduces water contamination and stream bank degradation. |
| <i>Improved Pesticide Management (301)</i> | 239 | 67 | Improved management for over 712,000 acres of land with a minimum of 229 wetlands, 109 ponds/lakes, 48 creeks/rivers and 131 dugouts. | Reduces risks of spills during pesticide application. |
| <i>Improved Nutrient Management (301A)</i> | 129 | 28 | Adopted on over 119,000 acres per year to protect 73 wetlands, 81 ponds/lakes, 35 creeks/rivers and 56 dugouts. | Fertilizer can pose a risk to the environment if over-applied. Sectional control systems for fertilizer applicators reduces double application of fertilizer in overlap areas. |
| <i>Fuel Storage (302)</i> | 180 | 52 | Stored 4 per cent more fuel in each of the new fuel tanks compared to the old ones. | Reduces leaks and spills that would contaminate surface water and improves fueling equipment efficiency. |
| <i>Used Oil Storage (303)</i> | 26 | 2 | Safely stored 31,200 gallons of used oil. | Prevents used oil and its more toxic contents from entering surface water, provides raw product for recycled engine oil and lubricants, and improves farm safety. |
| <i>Agricultural Plastics Waste Management (304)</i> | 26 | 7 | Better contained approximately 25,700 lbs. of grain bag and silage plastics. | Allows convenient and safe storage of agricultural sheet plastics prior to transporting to a recycling site or licensed landfill, and eliminates the need to dispose of plastics on farm. |

Table 4: Confined feeding operations specific Beneficial Management Practices projects completed under the Growing Forward 2 Environmental Stewardship Grant Program (2013-2018)

| <i>Project Title</i> | <i>Total Project</i> | | <i>Outcomes and Benefits</i> |
|--|----------------------|---------------------------|---|
| | Alberta | South Saskatchewan Region | |
| <i>Innovative Environmental Solutions for Confined Feeding Operations (400)</i> | 8 | 5 | Installed: automatic pump system for manure transfer tank to ensure timely pump out and to prevent overflow; lagoon aeration and underground pipeline to irrigation; twin feed line in grower/finisher barn to reduce wash frequency and wash |

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|---|----|----|--|
| | | | water going into lagoon; and compacted gravel to cover high traffic areas of feedlot pens to improve surface water management. |
| Engineering investigation and/or feasibility assessment (401) | 24 | 12 | Helped producers collect site information and evaluate potential solutions to improve manure management or address an environmental issue. |
| Construction or upgrade of a surface water management system (402) | 21 | 14 | Maintained water quality by installing or upgrading surface water control systems to better divert clean water and increase management of runoff from existing livestock facilities |
| Improved Manure Storage Facilities (404) | 49 | 12 | Reduced risk of storage overflow or need for winter spreading of manure by increasing capacity of existing storage or by constructing additional storage facility. Relocated or improved storage facilities that pose significant risk to water quality. |
| Relocation of a Confined Feeding Operation (405) | 9 | 6 | Relocated facilities such as cattle pens away from stream banks, lake shores or other areas that could pose a risk to water quality. |
| Manure Treatment – Solid/liquid Separation System (406) | 13 | 2 | Reduced the volume of manure to be transported and resulted in more efficient use of manure nutrients. |
| Manure Treatment – Composting (407) | 5 | 3 | Reduced the volume of manure to be transported and resulted in more efficient use of manure nutrients. |
| Improved Land Application of Manure (408) | 30 | 15 | To adopt management practices that improve recordkeeping, nutrient management and compliance with the <i>Agricultural Operations Practices Act</i> . |

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Strategy 4.10

Continue to develop an optimized water management system in the region. This will build on completed work including: A water storage opportunities study for the South Saskatchewan River Basin that will be complete by the end of 2015. Included in the study are the Oldman, Bow, South Saskatchewan and Red Deer rivers. This planning level study will provide advice to government and may be used to guide future planning and decision-making for the potential development of additional water storage in the region and the assessment of on-stream and off-stream storage sites. Additional storage could reduce the risk to existing water users such as irrigators, municipalities, industry and the environment, as well as improve protection of the aquatic environment and mitigate the climate change variability in the region.

Water supply in the South Saskatchewan River Basin in Alberta is naturally subject to highly variable flows. Expanding population, economic growth, and climate variability add additional challenges to managing our limited water supply. Through Strategy 4.10 in the South Saskatchewan Regional Plan, Alberta Agriculture and Forestry (AF) committed to developing an optimized water management system in the region. To deliver on this commitment, AF completed a study titled *Water Storage Opportunities in the South Saskatchewan River Basin in Alberta*. The study explored opportunities for additional storage to improve water security in the future, while respecting inter-provincial and international apportionment agreements and other legislative requirements. Click [here](#) to learn more about the study and its conclusions on water storage opportunities in the region.

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