

# *ISO 19131 Annual Crop Inventory – Data Product Specifications*

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Revision: A

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# **Data product specifications: Annual Crop Inventory**

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# Data product specifications: Annual Crop Inventory

## 1. Overview

### 1.1. Informal description

For 15 years the Earth Observation Team of Agriculture and Agri-Food Canada (AAFC) has been mapping crop types of individual fields in Canada. They developed an operational software system to decipher crop types using satellite observations and trustworthy ground information. Successful crop identification relies on image acquisitions from multiple sensors during key crop phenological stages (reproduction, seed development and senescence).

Multi-temporal optical data are the primary data source for crop classification because the NIR/SWIR channels are vital to crop classifications. Over a growing season, a minimum of three optical images are required to successfully identify crops. To the optical data, c-band radar data is added to help with physical plant structures and moisture measurements. In 2009 and 2010 the ScanSAR mode of RADARSAT-2, with its large swath (300 km) and moderate resolution (50 m), was used as it fits the agricultural landscape of the Prairie Provinces. From 2011-2019, the finer resolution of RADARSAT-2's Wide mode (30 m) was used, as it is better suited to the smaller fields in the rest of Canada. This finer resolution SAR data continues today with 30m Compact-Pol data from RCM.

Annual crop insurance data are the most accurate, detailed and complete sources of information for crop types in Canada. As such, AAFC has agreements with some provincial crop insurance agencies to use their data for the training and validation of the classification process. For provinces where insurance data cannot be accessed, ground-truth information is provided by point observations from AAFC staff or other provincial sources. Each year, AAFC staff collects tens of thousands of points identifying crops across the country. These point sources are combined and used as training or reference sites as well.

The training and validation data used to classify non-agricultural land cover types comes from numerous Land Cover / Land Use products, including the AAFC semi-decadal land use time series. Point data are taken from these products and adjusted (eliminating any that were in transitions areas between classes or in areas of high potential change (i.e. near urban expansion)). What remains is a stable series of known land cover points for the following classes: water, barren, urban, shrubland, wetland, grassland, agriculture (generalized), and forest.

Focusing on the Prairie Provinces in 2009 and 2010, a Decision Tree (DT) based methodology was applied using optical (Landsat-5, AWiFS, DMC) and radar (RADARSAT-2) imagery. The final map had a spatial resolution of 56m.

For the 2011 and 2012 growing season, this activity was extended to all the other provinces (except Newfoundland) in support of a national crop inventory. The final spatial resolution was increased to 30m, to aid in differentiating the smaller fields in the rest of Canada. For 2012, the lack of affordable optical data forced AAFC to rely mostly on RADARSAT-2 data.

In 2013, this activity expanded to include Newfoundland for the first time, and move to Landsat-8 as its sole-source of optical imagery. RADARSAT-2 continued to be the source of radar imagery. This combination of optical and radar imagery had been repeated over the agricultural extent of Canada in the subsequent years, until 2016 when Sentinel-2 and Gaofen-1 optical imagery were added. The Gaofen imagery was dropped after the 2017 season. For the 2021 map, the RADARSAT Constellation Mission (RCM) satellites became the source of radar imagery. In 2022, Landsat-9 imagery was added to the optical collection.

At present, this approach can consistently deliver a crop inventory that meets the overall target accuracy of at least 85% at a final spatial resolution of 30m.

Note: At the national scale, the crop type legend is not homogeneous. In some provinces, such as Alberta, Saskatchewan, and Quebec, we have been able to divide the crop types in to sub-categories (i.e. winter versus spring wheat). For other provinces, those classes may not have been subdivided. A lack of training sites and, in some cases, a limited availability of spectral data does not allow for the

differentiation of crops into sub-categories with sufficient precision. This can result in class discontinuities between provinces.

## 1.2. Data product specification - metadata

This section provides metadata about the creation of this data product specification

Data product specification – title:	Annual Crop Inventory
Data product specification - reference date:	2009-present
Data product specification - responsible party:	Earth Observation Team of the Science and Technology Branch (STB)
Data product specification – language:	English
Data product specification - topic category:	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;

## 1.3. Terms and Definitions

- Feature attribute  
characteristic of a feature
- Class  
description of a set of objects that share the same attributes, operations, methods, relationships, and semantics [UML Semantics]  
NOTE: A class does not always have an associated geometry (e.g. the metadata class).
- Feature  
abstraction of real world phenomena
- Object  
entity with a well-defined boundary and identity that encapsulates state and behaviour [UML Semantics]  
NOTE: An object is an instance of a class.
- Package  
grouping of a set of classes, relationships, and even other packages with a view to organizing the model into more abstract structures

## 1.4. Abbreviations

AAFC	Agriculture and Agri-Food Canada
AWiFS	Advanced Wide Field Sensor

DMC	Disaster Monitoring Constellation
DT	Decision-Tree Classifier
NIR/SWIR	Near Infrared/Short-Wavelength Infrared
RCM	RADARSAT Constellation Mission
SAR	Synthetic Aperture Radar
ScanSAR	Scanning Synthetic Aperture Radar
SPOT	Satellite Pour l'Observation de la Terre
STB	Science and Technology Branch

## 2. SPECIFICATION SCOPE

This data specification has only one scope, the general scope.

NOTE: The term 'specification scope' originates from the International Standard ISO19131. 'Specification scope' does not express the purpose for the creation of a data specification or the potential use of data, but identifies partitions of the data specification where specific requirements apply.

### 3. DATA PRODUCT IDENTIFICATION

#### 3.1. Data series identification

Title	Annual Crop Inventory
Alternate Title	AAFC Crop Type Mapping
Abstract	Understanding the state and trends in agriculture production is essential to combat both short-term and long-term threats to stable and reliable access to food for all, and to ensure a profitable agricultural sector. The Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) developed an operational system to generate crop type digital maps of Canadian agriculture annually. A Decision Tree (DT) based methodology is applied using optical and radar based satellite images. Currently this approach uses imagery from Landsat-8, Landsat-9, Sentinel-2, and RCM satellites, and can consistently deliver a crop inventory that meets the overall target accuracy of at least 85% at a final spatial resolution of 30m. In the beginning in 2009 and 2010 they focused solely on the Prairie Provinces (maps with 56m resolution were created). With the 2011 growing season, this activity was extended to other provinces in support of a national crop inventory and the resolution improved to 30m.
Purpose	The crop inventory provides fundamental information on the state and changes in Canada's agricultural landscape, and its value is wide-ranging. For example, the 2011 inventory included the identification of acreages that had been too wet to seed earlier in the year. These estimates fell within 3% of figures provided independently by the Provinces. The inventory has also been used to validate the practices of Canadian canola producers who wish to access the European bio-fuel feedstock market, estimated to be worth \$500 million annually.
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30m pixels (2011 – present) 56m pixels (2009, 2010)
Geographic Description	2022 & 2023 – All Canadian Provinces, and Yukon Territory 2013 to 2021 – All Canadian Provinces 2011 & 2012 – All Canadian Provinces (except Newfoundland) 2009 & 2010 – Prairie Provinces
Supplemental Information	Data is provided in .TIF format and is subdivided at provincial boundaries.  Citation: Agriculture and Agri-Food Canada, 2023, "Annual Space-Based Crop Inventory for Canada, 2009-2023", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch. <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a>
Constraints	Data are subject to the Government of Canada Open Data Licence: <a href="http://open.canada.ca">http://open.canada.ca</a>
Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geographic data, Geography
Scope identification	series

## 3.2. Data product identification

### 3.2.1. Annual Crop Inventory, 2009

Title	Annual Crop Inventory, 2009
Alternate Title	AAFC Crop Type Mapping in the Prairies 2009
Abstract	<p>In 2009 the Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) began the process of generating annual crop inventory digital maps using satellite imagery. Focusing on the Prairie Provinces, a Decision Tree (DT) based methodology was applied using both optical (AWiFS, Landsat-5) and radar (RADARSAT-2) based satellite imagery, and having a final spatial resolution of 56m. Methods were also developed to enhance the optical classification with RADARSAT-2 imagery, addressing issues associated with cloud cover. In conjunction with satellite acquisitions, ground-truth information was provided by provincial crop insurance companies and point observations from our regional AAFC colleagues. The overall process for Crop Inventory Map includes: satellite data acquisition; field data acquisition for classification training and accuracy assessment; and, operational implementation of the classification methodology. The initial methodology was developed in partnership with AAFC Research Branch, and supported in part by the Canadian Space Agency. The long-term objective of this endeavour is to expand from the Prairies and produce an annual crop inventory of the entire agricultural extent of Canada.</p>
Purpose	Annual crop type mapping in the Prairies provinces
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	56m
Geographic Description	Prairie Provinces
Supplemental Information	<p>The overall accuracy of this map for crop classes in the Prairies is: 80% Kappa: 0.73</p> <p>Citation: Agriculture and Agri-Food Canada, 2009, "Annual Space-Based Crop Inventory for Canada, 2009", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch. <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a></p>
Constraints	Data are subject to the Government of Canada Open Data Licence: <a href="http://open.canada.ca">http://open.canada.ca</a>
Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, maps, Geographic data, Geography
Scope Identification	Dataset
Feature Attribute Names	Class(Value)

### 3.2.2. Annual Crop Inventory, 2010

Title	Annual Crop Inventory, 2010
Alternate Title	AAFC Crop Type Mapping in the Prairies, 2010
Abstract	<p>In 2010 the Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) continued the process of generating annual crop inventory digital maps using</p>



	satellite imagery. Focusing on the Prairie Provinces, a Decision Tree (DT) based methodology was applied using both optical (AWiFS, Landsat-5, DMC) and radar (RADARSAT-2) based satellite imagery, and having a final spatial resolution of 56m. Methods were also developed to enhance the optical classification with RADARSAT-2 imagery, addressing issues associated with cloud cover. In conjunction with satellite acquisitions, ground-truth information was provided by provincial crop insurance companies and point observations from our regional AAFC colleagues. The overall process for Crop Inventory Map includes: satellite data acquisition; field data acquisition for classification training and accuracy assessment; and, operational implementation of the classification methodology.
Purpose	Annual crop type mapping in the Prairies provinces
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	56 m
Geographic Description	Prairie Provinces
Supplemental Information	<p>The overall accuracy of this map for crop classes in the Prairies is: 85.1% Kappa: 0.82</p> <p>Citation: Agriculture and Agri-Food Canada, 2010, "Annual Space-Based Crop Inventory for Canada, 2010", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch.  <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a></p>
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Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	Dataset
Feature Attribute Names	Class(Value)

### 3.2.3. Annual Crop Inventory, 2011

Title	Annual Crop Inventory, 2011
Alternate Title	AAFC Crop Type Mapping, 2011
Abstract	In 2011, the Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) expanded the process of generating annual crop inventory digital maps using satellite imagery to include British Columbia, Ontario, Quebec, and the Maritime provinces, in support of a national crop inventory. A Decision Tree (DT) based methodology was applied using optical (Landsat-5, DMC) and radar (RADARSAT-2) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by provincial crop insurance companies and point observations from our regional AAFC colleagues.
Purpose	An annual national crop type map
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30 m
Geographic Description	Canada (except Newfoundland)

Supplemental Information	<p>Overall accuracies for crop classes are:  Prince Edward Island: 67%  Nova Scotia: 71%  New Brunswick: 88%  Quebec: 81%  Ontario: 82%  Manitoba: 79%  Saskatchewan: 87%  Alberta: 88%  British Columbia: Not evaluated</p> <p>Citation: Agriculture and Agri-Food Canada, 2011, "Annual Space-Based Crop Inventory for Canada, 2011", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch.  <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a></p>
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Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	Dataset
Feature Attribute Names	Class(Value)

### 3.2.4. Annual Crop Inventory, 2012

Title	Annual Crop Inventory, 2012
Alternate Title	AAFC Crop Type Mapping, 2012
Abstract	In 2012, the Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) repeated the process of generating annual crop inventory digital maps using satellite imagery for all of Canada (except Newfoundland), in support of a national crop inventory. A Decision Tree (DT) based methodology was applied using optical (DMC, SPOT) and radar (RADARSAT-2) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by provincial crop insurance companies and point observations from our regional AAFC colleagues
Purpose	An annual national crop type map
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30 m
Geographic Description	Canada (except Newfoundland)
Supplemental Information	<p>Overall accuracies for crop classes are:  Prince Edward Island: 79%  Nova Scotia: 90%  New Brunswick: 88%  Quebec: 82%  Ontario: 76%  Manitoba: 85%  Saskatchewan: 82%  Alberta: 88%  British Columbia: 73%</p> <p>Citation: Agriculture and Agri-Food Canada, 2012, "Annual Space-</p>

	Based Crop Inventory for Canada, 2012", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch. <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a>
Constraints	Data are subject to the Government of Canada Open Data Licence : <a href="http://open.canada.ca">http://open.canada.ca</a>
Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	Dataset
Feature Attribute Names	Class(Value)

### 3.2.5. Annual Crop Inventory, 2013

Title	Annual Crop Inventory, 2013
Alternate Title	AAFC Crop Type Mapping, 2013
Abstract	In 2013, the Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) repeated the process of generating annual crop inventory digital maps using satellite imagery for all of Canada, in support of a national crop inventory. A Decision Tree (DT) based methodology was applied using optical (Landsat-8) and radar (RADARSAT-2) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by provincial crop insurance companies and point observations from the BC Ministry of Agriculture and our regional AAFC colleagues
Purpose	An annual national crop type map
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30 m
Geographic Description	Canada
Supplemental Information	Overall accuracies for crop classes are: Newfoundland: 98.8% (mainly pasture) Prince Edward Island: 86.6% Nova Scotia: 76.1% New Brunswick: 88.9% Quebec: 85.8% Ontario: 87.0% Manitoba: 85.4% Saskatchewan: 86.5% Alberta: 89.9% British Columbia: 79.2%  Citation: Agriculture and Agri-Food Canada, 2013, "Annual Space-Based Crop Inventory for Canada, 2013", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch. <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a>
Constraints	Data are subject to the Government of Canada Open Data Licence : <a href="http://open.canada.ca">http://open.canada.ca</a>
Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	Dataset

Feature Attribute Names	Class(Value)
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### 3.2.6. Annual Crop Inventory, 2014

Title	Annual Crop Inventory, 2014
Alternate Title	AAFC Crop Type Mapping, 2014
Abstract	In 2014, the Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) repeated the process of generating annual crop inventory digital maps using satellite imagery for all of Canada, in support of a national crop inventory. A Decision Tree (DT) based methodology was applied using optical (Landsat-8) and radar (RADARSAT-2) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by provincial crop insurance companies and point observations from the BC Ministry of Agriculture and our regional AAFC colleagues.
Purpose	An annual national crop type map
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30 m
Geographic Description	Canada
Supplemental Information	Overall accuracies for crop classes are: Newfoundland: Not evaluated Prince Edward Island: 81.0% Nova Scotia: 64.4% New Brunswick: 89.1% Quebec: 83.9% Ontario: 87.9% Manitoba: 90.3% Saskatchewan: 85.9% Alberta: 89.4% British Columbia: 88.4%  Citation: Agriculture and Agri-Food Canada, 2014, "Annual Space-Based Crop Inventory for Canada, 2014", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch. <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a>
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Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	Dataset
Feature Attribute Names	Class(Value)

### 3.2.7. Annual Crop Inventory, 2015

Title	Annual Crop Inventory, 2015
Alternate Title	AAFC Crop Type Mapping, 2015
Abstract	In 2015, the Earth Observation Team of the Science and Technology

	Branch (STB) at Agriculture and Agri-Food Canada (AAFC) repeated the process of generating annual crop inventory digital maps using satellite imagery for all of Canada, in support of a national crop inventory. A Decision Tree (DT) based methodology was applied using optical (Landsat-8) and radar (RADARSAT-2) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by provincial crop insurance companies and point observations from the BC Ministry of Agriculture and our regional AAFC colleagues
Purpose	An annual national crop type map
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30 m
Geographic Description	Canada
Supplemental Information	<p>Overall provincial accuracies for crop classes are:</p> <p>Newfoundland: Not evaluated  Prince Edward Island: 83.69%  Nova Scotia: 85.24%  New Brunswick: 86.05%  Quebec: 87.10%  Ontario: 89.63%  Manitoba: 90.01%  Saskatchewan: 89.65%  Alberta: 88.91%  British Columbia: Not evaluated</p> <p>Overall provincial accuracies for non-agriculture land cover are:</p> <p>Newfoundland: 68.32%  Prince Edward Island: 75.67%  Nova Scotia: 66.07%  New Brunswick: 68.10%  Quebec: 72.76%  Ontario: 74.07%  Manitoba: 63.38%  Saskatchewan: 70.08%  Alberta: 66.90%  British Columbia: 74.40%</p> <p>Citation: Agriculture and Agri-Food Canada, 2015, "Annual Space-Based Crop Inventory for Canada, 2015", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch.  <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a></p>
Constraints	Data are subject to the Government of Canada Open Data Licence : <a href="http://open.canada.ca">http://open.canada.ca</a>
Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	Dataset
Feature Attribute Names	Class(Value)

### 3.2.8. Annual Crop Inventory, 2016

Title	Annual Crop Inventory, 2016
Alternate Title	AAFC Crop Type Mapping, 2016
Abstract	In 2016, the Earth Observation Team of the Science and Technology

	Branch (STB) at Agriculture and Agri-Food Canada (AAFC) repeated the process of generating annual crop inventory digital maps using satellite imagery for all of Canada, in support of a national crop inventory. A Decision Tree (DT) based methodology was applied using optical (Landsat-8, Sentinel-2, Gaofen-1) and radar (RADARSAT-2) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by: provincial crop insurance companies in Alberta, Saskatchewan, Manitoba, & Quebec; point observations from the BC Ministry of Agriculture, & the Ontario Ministry of Agriculture, Food and Rural Affairs; and data collection supported by our regional AAFC Research and Development Centres in St. John's, Kentville, Charlottetown, Fredericton, Guelph, and Summerland
Purpose	An annual national crop type map
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30 m
Geographic Description	Canada
Supplemental Information	<p>Overall provincial accuracies for crop classes are:</p> <p>Newfoundland: 94.51%</p> <p>Prince Edward Island: 82.44%</p> <p>Nova Scotia: 90.59%</p> <p>New Brunswick: 89.66%</p> <p>Quebec: 91.17%</p> <p>Ontario: 88.98%</p> <p>Manitoba: 92.44%</p> <p>Saskatchewan: 92.26%</p> <p>Alberta: 90.84%</p> <p>British Columbia: 86.27%</p> <p>Overall provincial accuracies for non-agriculture land cover are:</p> <p>Newfoundland: 72.90%</p> <p>Prince Edward Island: 77.12%</p> <p>Nova Scotia: 70.15%</p> <p>New Brunswick: 70.32%</p> <p>Quebec: 73.02%</p> <p>Ontario: 75.11%</p> <p>Manitoba: 68.08%</p> <p>Saskatchewan: 71.28%</p> <p>Alberta: 68.77%</p> <p>British Columbia: 76.20%</p> <p>Citation: Agriculture and Agri-Food Canada, 2016, "Annual Space-Based Crop Inventory for Canada, 2016", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch.  <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a></p>
Constraints	Data are subject to the Government of Canada Open Data Licence : <a href="http://open.canada.ca">http://open.canada.ca</a>
Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	Dataset
Feature Attribute Names	Class(Value)



**3.2.9. Annual Crop Inventory, 2017**

Title	Annual Crop Inventory, 2017
Alternate Title	AAFC Crop Type Mapping, 2017
Abstract	In 2017, the Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) repeated the process of generating annual crop inventory digital maps using satellite imagery for all of Canada, in support of a national crop inventory. A Decision Tree (DT) based methodology was applied using optical (Landsat-8, Sentinel-2, Gaofen-1) and radar (RADARSAT-2) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by: provincial crop insurance companies in Alberta, Saskatchewan, Manitoba, & Quebec; point observations from the BC Ministry of Agriculture, & the Ontario Ministry of Agriculture, Food and Rural Affairs; and data collection supported by our regional AAFC Research and Development Centres in St. John's, Kentville, Charlottetown, Fredericton, Guelph, and Summerland
Purpose	An annual national crop type map
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30 m
Geographic Description	Canada
Supplemental Information	<p>Overall provincial accuracies for crop classes are:</p> <p>Newfoundland: 91.83%</p> <p>Prince Edward Island: 87.28%</p> <p>Nova Scotia: 89.49%</p> <p>New Brunswick: 81.78%</p> <p>Quebec: 89.07%</p> <p>Ontario: 84.70%</p> <p>Manitoba: 93.10%</p> <p>Saskatchewan: 91.28%</p> <p>Alberta: 91.48%</p> <p>British Columbia: 92.79%</p> <p>Overall provincial accuracies for non-agriculture land cover are:</p> <p>Newfoundland: 72.16%</p> <p>Prince Edward Island: 76.33%</p> <p>Nova Scotia: 72.30%</p> <p>New Brunswick: 69.48%</p> <p>Quebec: 72.89%</p> <p>Ontario: 75.88%</p> <p>Manitoba: 70.29%</p> <p>Saskatchewan: 72.20%</p> <p>Alberta: 68.46%</p> <p>British Columbia: 76.93%</p> <p>Citation: Agriculture and Agri-Food Canada, 2017, "Annual Space-Based Crop Inventory for Canada, 2017", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch.  <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a></p>
Constraints	Data are subject to the Government of Canada Open Data Licence : <a href="http://open.canada.ca">http://open.canada.ca</a>
Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) -

	Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	Dataset
Feature Attribute Names	Class(Value)

### 3.2.10. Annual Crop Inventory, 2018

Title	Annual Crop Inventory, 2018
Alternate Title	AAFC Crop Type Mapping, 2018
Abstract	In 2018, the Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) repeated the process of generating annual crop inventory digital maps using satellite imagery for all of Canada, in support of a national crop inventory. A Decision Tree (DT) based methodology was applied using optical (Landsat-8, Sentinel-2) and radar (RADARSAT-2) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by: provincial crop insurance companies in Alberta, Saskatchewan, Manitoba, & Quebec; point observations from the BC Ministry of Agriculture, & the Ontario Ministry of Agriculture, Food and Rural Affairs; and data collection supported by our regional AAFC Research and Development Centres in St. John's, Kentville, Charlottetown, Fredericton, Guelph, and Summerland
Purpose	An annual national crop type map
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30 m
Geographic Description	Canada
Supplemental Information	<p>Overall provincial accuracies for crop classes are:</p> <p>Newfoundland: 93.84%</p> <p>Prince Edward Island: 81.92%</p> <p>Nova Scotia: 92.50%</p> <p>New Brunswick: 88.83%</p> <p>Quebec: 92.28%</p> <p>Ontario: 91.99%</p> <p>Manitoba: 94.61%</p> <p>Saskatchewan: 91.65%</p> <p>Alberta: 91.95%</p> <p>British Columbia: 93.09%</p> <p>Overall provincial accuracies for non-agriculture land cover are:</p> <p>Newfoundland: 74.67%</p> <p>Prince Edward Island: 75.21%</p> <p>Nova Scotia: 71.97%</p> <p>New Brunswick: 70.99%</p> <p>Quebec: 73.50%</p> <p>Ontario: 76.02%</p> <p>Manitoba: 70.50%</p> <p>Saskatchewan: 72.79%</p> <p>Alberta: 68.36%</p> <p>British Columbia: 77.04%</p> <p>Citation: Agriculture and Agri-Food Canada, 2018, "Annual Space-Based Crop Inventory for Canada, 2018", Agroclimate, Geomatics</p>



	and Earth Observation Division, Science and Technology Branch. <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a>
Constraints	Data are subject to the Government of Canada Open Data Licence : <a href="http://open.canada.ca">http://open.canada.ca</a>
Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	dataset
Feature Attribute Names	Class(Value)

### 3.2.11. Annual Crop Inventory, 2019

Title	Annual Crop Inventory, 2019
Alternate Title	AAFC Crop Type Mapping, 2019
Abstract	In 2019, the Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) repeated the process of generating annual crop inventory digital maps using satellite imagery for all of Canada, in support of a national crop inventory. A Decision Tree (DT) based methodology was applied using optical (Landsat-8, Sentinel-2) and radar (RADARSAT-2) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by: provincial crop insurance companies in Alberta, Saskatchewan, Manitoba, & Quebec; point observations from the PEI Department of Environment, Water and Climate Change and data collection supported by our regional AAFC Research and Development Centres in St. John's, Kentville, Fredericton, and Guelph.
Purpose	An annual national crop type map
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30 m
Geographic Description	Canada
Supplemental Information	Overall provincial accuracies for crop classes are: Newfoundland: 91.00% Prince Edward Island: 89.78% Nova Scotia: 89.10% New Brunswick: 91.90% Quebec: 91.80% Ontario: 87.27% Manitoba: 94.27% Saskatchewan: 91.63% Alberta: 91.29% British Columbia: 89.35%  Overall provincial accuracies for non-agriculture land cover are: Newfoundland: 72.88% Prince Edward Island: 77.77% Nova Scotia: 69.71% New Brunswick: 68.13% Quebec: 72.94% Ontario: 74.89% Manitoba: 70.29%

	<p>Saskatchewan: 71.39%  Alberta: 68.17%  British Columbia: 76.39%</p> <p>Citation: Agriculture and Agri-Food Canada, 2019, "Annual Space-Based Crop Inventory for Canada, 2019", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch.  <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a></p>
Constraints	Data are subject to the Government of Canada Open Data Licence : <a href="http://open.canada.ca">http://open.canada.ca</a>
Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	dataset
Feature Attribute Names	Class(Value)

### 3.2.12. Annual Crop Inventory, 2020

Title	Annual Crop Inventory, 2020
Alternate Title	AAFC Crop Type Mapping, 2020
Abstract	<p>In 2020, the Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) repeated the process of generating annual crop inventory digital maps using satellite imagery for all of Canada, in support of a national crop inventory. A Decision Tree (DT) based methodology was applied using optical (Landsat-8, Sentinel-2) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by: provincial crop insurance companies in Alberta, Saskatchewan, Manitoba, &amp; Quebec; point observations from the PEI Department of Environment, Water and Climate Change; the Ontario Ministry of Agriculture, Food and Rural Affairs; and data collection supported by our regional AAFC Research and Development Centres in St. John's, Fredericton, and Guelph. <b>Due to COVID-19 travel restrictions, complete sampling coverages in NL, NS, NB and BC were not possible, as a result the general agriculture class (120) is found in these provinces in areas where there was no ground data collected.</b></p>
Purpose	An annual national crop type map
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30 m
Geographic Description	Canada
Supplemental Information	<p>Overall provincial accuracies for crop classes are:</p> <p>Newfoundland: 95.08%  Prince Edward Island: 85.85%  Nova Scotia: N/A  New Brunswick: 95.74%  Quebec: 91.20%  Ontario: 88.26%  Manitoba: 93.58%  Saskatchewan: 93.87%  Alberta: 91.09%  British Columbia: 85.11%</p>

	<p>Overall provincial accuracies for non-agriculture land cover are:          Newfoundland: 75.09%          Prince Edward Island: 75.74%          Nova Scotia: 70.52%          New Brunswick: 68.57%          Quebec: 72.85%          Ontario: 75.84%          Manitoba: 68.97%          Saskatchewan: 69.93%          Alberta: 65.89%          British Columbia: 76.87%</p> <p>Citation: Agriculture and Agri-Food Canada, 2020, "Annual Space-Based Crop Inventory for Canada, 2020", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch.  <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a></p>
Constraints	Data are subject to the Government of Canada Open Data Licence : <a href="http://open.canada.ca">http://open.canada.ca</a>
Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	dataset
Feature Attribute Names	Class(Value)

### 3.2.13. Annual Crop Inventory, 2021

Title	Annual Crop Inventory, 2021
Alternate Title	AAFC Crop Type Mapping, 2021
Abstract	<p>In 2021, the Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) repeated the process of generating annual crop inventory digital maps using satellite imagery for all of Canada, in support of a national crop inventory. A Decision Tree (DT) based methodology was applied using optical (Landsat-8, Sentinel-2), and radar (RCM) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by: provincial crop insurance companies in Alberta, Saskatchewan, Manitoba, &amp; Quebec; point observations from the PEI Department of Environment, Water and Climate Change; Ontario Ministry of Agriculture, Food and Rural Affairs; University of Guelph - Ridgetown campus; British Columbia Ministry of Agriculture; and data collection supported by our regional AAFC Research and Development Centres in St. John's, Kentville, Fredericton, Guelph and Summerland. <b>Due to COVID-19 travel restrictions and forest fires, complete sampling coverages in BC was not possible, as a result the general agriculture class (120) is found in this province in areas where there was no ground data collected.</b></p>
Purpose	An annual national crop type map
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30 m
Geographic Description	Canada

Supplemental Information	<p>Overall provincial accuracies for crop classes are:  Newfoundland: 91.59%  Prince Edward Island: 85.90%  Nova Scotia: 87.94%  New Brunswick: 87.49%  Quebec: 92.74%  Ontario: 87.53%  Manitoba: 92.38%  Saskatchewan: 92.27%  Alberta: 90.10%  British Columbia: 86.42% (Fraser Valley only)</p> <p>Overall provincial accuracies for non-agriculture land cover are:  Newfoundland: 73.99%  Prince Edward Island: 75.23%  Nova Scotia: 71.97%  New Brunswick: 70.44%  Quebec: 72.81%  Ontario: 75.66%  Manitoba: 67.51%  Saskatchewan: 71.28%  Alberta: 66.60%  British Columbia: 77.05%</p> <p>Citation: Agriculture and Agri-Food Canada, 2021, "Annual Space-Based Crop Inventory for Canada, 2021", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch.  <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a></p>
Constraints	Data are subject to the Government of Canada Open Data Licence : <a href="http://open.canada.ca">http://open.canada.ca</a>
Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	dataset
Feature Attribute Names	Class(Value)

### 3.2.14. Annual Crop Inventory, 2022

Title	Annual Crop Inventory, 2022
Alternate Title	AAFC Crop Type Mapping, 2022
Abstract	<p>In 2022, the Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) repeated the process of generating annual crop inventory digital maps using satellite imagery for all Canadian provinces, in support of a national crop inventory. New this year, a map of the agricultural regions in the Yukon Territory was also produced. A Decision Tree (DT) based methodology was applied using optical (Landsat-8, Landsat-9, Sentinel-2), and radar (RCM) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by: provincial crop insurance companies in Alberta, Saskatchewan, Manitoba, &amp; Quebec; point observations from the PEI Department of Environment, Water and Climate Change; Ontario Ministry of Agriculture, Food and Rural Affairs; University of Guelph - Ridgetown campus; British Columbia Ministry of Agriculture; and data collection supported by our regional AAFC Research and Development Centres in St. John's,</p>

	Kentville, Fredericton, Guelph, Summerland and Whitehorse.
Purpose	An annual national crop type map
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30 m
Geographic Description	Canada
Supplemental Information	<p>Overall provincial accuracies for crop classes are:</p> <p>Newfoundland: 92.61%</p> <p>Prince Edward Island: 84.99%</p> <p>Nova Scotia: 91.78%</p> <p>New Brunswick: 91.83%</p> <p>Quebec: 92.10%</p> <p>Ontario: 84.34%</p> <p>Manitoba: 92.34%</p> <p>Saskatchewan: 93.01%</p> <p>Alberta: 91.68%</p> <p>British Columbia: 85.02%</p> <p>Yukon: 91.02%</p> <p>Overall provincial accuracies for non-agriculture land cover are:</p> <p>Newfoundland: 73.97%</p> <p>Prince Edward Island: 74.30%</p> <p>Nova Scotia: 72.55%</p> <p>New Brunswick: 68.44%</p> <p>Quebec: 68.84%</p> <p>Ontario: 73.37%</p> <p>Manitoba: 69.40%</p> <p>Saskatchewan: 71.66%</p> <p>Alberta: 66.69%</p> <p>British Columbia: 77.66%</p> <p>Yukon: 79.99%</p> <p>Citation: Agriculture and Agri-Food Canada, 2022, "Annual Space-Based Crop Inventory for Canada, 2022", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch.  <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a></p>
Constraints	Data are subject to the Government of Canada Open Data Licence : <a href="http://open.canada.ca">http://open.canada.ca</a>
Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	dataset
Feature Attribute Names	Class(Value)

### 3.2.15. Annual Crop Inventory, 2023

Title	Annual Crop Inventory, 2023
Alternate Title	AAFC Crop Type Mapping, 2023
Abstract	In 2023, the Earth Observation Team of the Science and Technology Branch (STB) at Agriculture and Agri-Food Canada (AAFC) repeated the process of generating annual crop inventory digital maps using satellite imagery for all Canadian provinces, in support of a national crop inventory. This year we again produced a map of the agricultural regions in the Yukon Territory. A Decision Tree (DT) based

	methodology was applied using optical (Landsat-8, Landsat-9, Sentinel-2), and radar (RCM) based satellite images, and having a final spatial resolution of 30m. In conjunction with satellite acquisitions, ground-truth information was provided by: provincial crop insurance companies in Alberta, Saskatchewan, Manitoba, & Quebec; point observations from the PEI Department of Environment, Water and Climate Change; and data collection supported by our regional AAFC Research and Development Centres in St. John's, Kentville, Fredericton, Guelph, Summerland and Whitehorse. New this season, Forest Fire Perimeter Estimate polygons from Natural Resources Canada's Canadian Forest Service were used to show burned areas of landcover. (Class - 60).
Purpose	An annual national crop type map
Topic Category	Farming; Environment; GeoscientificInformation; imagery; BaseMaps; EarthCover;
Spatial Representation Type	grid
Spatial Resolution	30 m
Geographic Description	Canada
Supplemental Information	<p>Overall provincial accuracies for crop classes are:</p> <p>Newfoundland: 90.16%</p> <p>Prince Edward Island: 81.84%</p> <p>Nova Scotia: 88.51%</p> <p>New Brunswick: 86.12%</p> <p>Quebec: 90.19%</p> <p>Ontario: 85.57%</p> <p>Manitoba: 92.10%</p> <p>Saskatchewan: 91.92%</p> <p>Alberta: 88.53%</p> <p>British Columbia: 85.50%</p> <p>Yukon: 93.96%</p> <p>Overall provincial accuracies for non-agriculture land cover are:</p> <p>Newfoundland: 72.43%</p> <p>Prince Edward Island: 71.15%</p> <p>Nova Scotia: 71.60%</p> <p>New Brunswick: 70.27%</p> <p>Quebec: 68.87%</p> <p>Ontario: 73.38%</p> <p>Manitoba: 68.47%</p> <p>Saskatchewan: 71.00%</p> <p>Alberta: 67.01%</p> <p>British Columbia: 75.94%</p> <p>Yukon: 79.80%</p> <p>Citation: Agriculture and Agri-Food Canada, 2023, "Annual Space-Based Crop Inventory for Canada, 2023", Agroclimate, Geomatics and Earth Observation Division, Science and Technology Branch.  <a href="https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9">https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9</a></p>
Constraints	Data are subject to the Government of Canada Open Data Licence : <a href="http://open.canada.ca">http://open.canada.ca</a>
Keywords	Government of Canada Core Subject Thesaurus (2000-02-01) - Remote Sensing, Satellites, Agriculture, Crops, Crop insurance, Farmlands, Forage crops, Land cover, Geomatics, Geographic Information Systems, Geographic data, maps, Geography
Scope Identification	dataset
Feature Attribute Names	Class(Value)

## 4. DATA CONTENT AND STRUCTURE

Not Applicable

### 4.1. Feature-based application schema

Not Applicable

### 4.2. Feature catalogue – AAFC Crop Type Feature Catalog

Title	AAFC Crop Type Feature Catalog
Scope	series
Version Number	1
Version Date	February 29, 2024
Producer	Agriculture and Agri-food Canada

System-generated attributes (for example, OBJECTID, Shape, Shape Length and Area) are not defined in the feature catalog.

**4.2.1. Feature attributes****4.2.1.1. Class(Value)**

Name	Class(Value)			
Definition				
Aliases				
Producer	AAFC			
Value Data Type	integer			
Value Domain Type	1 (enumerated)			
Value Domain				
	Feature Attribute Value			
	Label	Code	RGB	Definition
	Cloud	10	0,0,0	Areas unclassified due to cloud, shadow or other image quality factors.
	Water	20	51,51,255	Water bodies (lakes, reservoirs, rivers, streams, salt water, etc).
	Exposed Land / Barren	30	153,102,102	Land that is predominately non-vegetated and non-developed. Includes: glacier, rock, sediments, burned areas, rubble, mines, other naturally occurring non-vegetated surfaces. Excludes fallow agriculture
	Urban / Developed	34	204,102,153	Land that is predominantly built-up or developed and vegetation associated with these land covers. This includes road surfaces, railway surfaces, buildings and paved surfaces, urban areas, industrial sites, mine structures, golf courses, etc.
	Greenhouses	35	225,225,225	Greenhouses have been visually identified from satellite imagery
	Shrubland	50	255,255,0	Predominantly woody vegetation of relatively low height (generally +/-2 meters). May include grass or wetlands with woody vegetation, regenerating forest.
	Wildfire / Burnt Area	60	102, 102, 102	Land that has experienced fire this season. Areas determined by the Forest Fire Perimeter Estimate polygons distributed by the Canadian Forest Service.



	Wetland	80	153,51,153	Land with a water table near/at/above soil surface for enough time to promote wetland or aquatic processes (semi-permanent or permanent wetland vegetation, including fens, bogs, swamps, sloughs, marshes etc).
	Peatland	85	80,27,80	Wetlands that are commercially harvested for peat.
	Grassland	110	204,204,0	Predominantly native grasses and other herbaceous vegetation, may include some shrubland cover.
	Agriculture (undifferentiated)	120	204,102,0	Agricultural land, including annual and perennial crops; and would exclude grassland. This class is mapped only if the distinction of sub-agricultural covers (classes 122-199) is not possible.
	Pasture / Forages	122	255,204,51	Periodically cultivated. Includes tame grasses and other perennial crops such as alfalfa and clover grown alone or as mixtures for hay, pasture or seed.
	Too Wet to be Seeded	130	120,153,246	Agricultural fields that are normally seeded that remain unseeded due to excess spring moisture.
	Fallow	131	255,153,0	Plowed and harrowed fields that are left unsown for the growing season.
	Cereals	132	102,0,0	This class is mapped only if the distinction of sub-cereal covers (classes 133-146) is not possible.
	Barley	133	218,227,29	
	Other Grains	134	153,204,0	
	Millet	135	210,219,37	
	Oats	136	209,213,43	
	Rye	137	202,206,50	
	Spelt	138	195,198,58	
	Triticale	139	185,188,68	
	Wheat	140	167,179,77	This sub-cereal class is mapped

			only if the distinction of sub-wheat covers (classes 145-146) is not possible.
Sorghum	142	153,153,0	
Switchgrass	141	185,198,78	
Quinoa	143	233,226,177	
Winter Wheat	145	128,151,105	
Spring Wheat	146	146,165,91	
Corn	147	255,255,153	
Tobacco	148	152,136,124	
Ginseng	149	121,155,147	
Oilseeds	150	94,162,99	This class is mapped only if the distinction of sub-oilseed covers (classes 151-158) is not possible.
Borage	151	82,174,119	
Camelina	152	65,191,122	
Canola / Rapeseed	153	214,255,112	
Flaxseed	154	140,140,255	
Mustard	155	214,204,0	
Safflower	156	255,127,0	
Sunflower	157	49,84,145	
Soybeans	158	204,153,51	
Pulses	160	137,110,67	This class is mapped only if the distinction of sub-pulse covers (classes 162-174) is not possible.
Other Pulses	161	153,102,51	
Peas	162	143,108,61	
Chickpeas	163	182,164,114	
Beans	167	130,101,74	
Fababeans	168	163,144,105	
Lentils	174	184,89,0	
Vegetables	175	183,75,21	This class is mapped only if the distinction of sub-vegetable covers (classes 176-179) is not possible.
Tomatoes	176	255,138,138	
Potatoes	177	255,204,204	
Sugarbeets	178	111,85,202	
Other Vegetables	179	255,204,255	
Fruits	180	220,84,36	This class is mapped only if the distinction of sub-fruit covers (classes 181-190) is not possible.

Berries	181	208,90,48	This sub-fruit class is mapped only if the distinction of sub-berry covers (classes 182-185) is not possible.
Blueberry	182	210,0,0	
Cranberry	183	204,0,0	
Other Berry	185	220,50,0	
Orchards	188	255,102,102	
Other Fruits	189	197,69,59	
Vineyards	190	116,66,189	
Hops	191	255,204,153	
Sod	192	181,251,5	
Herbs	193	204,255,5	
Nursery	194	7,249,140	
Buckwheat	195	0,255,204	
Canaryseed	196	204,51,204	
Hemp	197	142,118,114	
Vetch	198	177,149,79	
Other Crops	199	116,154,102	
Forest (undifferentiated)	200	0,153,0	Predominantly forested or treed areas. This class is mapped only if the distinction of sub-forest covers (classes 210-230) is not possible.
Coniferous	210	0,102,0	Predominantly coniferous forests or treed areas
Broadleaf	220	0,204,0	Predominantly broadleaf/deciduous forests or treed areas.
Mixedwood	230	204,153,0	Forest that is a combination of both the coniferous and broadleaf classes

## 5. REFERENCE SYSTEMS

### 5.1. Spatial reference system

Projected Coordinate Systems:

```
PROJCS["AAFC_Albers_Conical_Equal_Area",  
GEOGCS["GCS_WGS_1984", DATUM["D_WGS_1984",  
SPHEROID["WGS_1984",6378137.0,298.257223563]],  
PRIMEM["Greenwich",0.0],  
UNIT["Degree",0.0174532925199433]],  
PROJECTION["Albers"], PARAMETER["False_Easting",0.0],  
PARAMETER["False_Northing",0.0],  
PARAMETER["Central_Meridian",-96.0],  
PARAMETER["Standard_Parallel_1",44.75],  
PARAMETER["Standard_Parallel_2",55.75],  
PARAMETER["Latitude_Of_Origin",40.0],  
UNIT["Meter",1.0]]
```

### 5.2. Temporal reference system

Gregorian calendar

## 6. DATA QUALITY

### 6.1. Completeness

### 6.2. Logical consistency

### 6.3. Positional accuracy

### 6.4. Temporal accuracy

To date this approach can consistently deliver a crop inventory that meets the overall target accuracy of at least 85% at a final spatial resolution of 30m (56m in 2009 and 2010). Individual provincial accuracies for each dataset can be found within section 3.2

### 6.5. Lineage statement

Lineage Statement	Data Series: Over a single growing season, optical and radar images are collected in conjunction with ground data provided by a combination of AAFC personnel, provincial experts, contractors, and provincial crop insurance companies. All this data is run through a Decision Tree (DT) algorithm, whose crop map output has an image-based segmentation applied, before a final accuracy assessment is calculated.
Scope	

## 7. DATA CAPTURE

To create the digital crop inventory, the Earth Observation Team applies a Decision Tree (DT) methodology to optical and radar satellite images that were acquired over a single growing season. The DT algorithm uses the known crop types of certain locations on the ground (gathered by AAFC employees; the BC Ministry of Agriculture; Ontario Ministry of Agriculture, Food and Rural Affairs; PEI Department of Environment, Water and Climate Change; University of Guelph - Ridgetown campus; private contractors; or provided by provincial crop insurance companies) to spectrally differentiate each of the crop types being mapped. These relationships are then applied to the satellite image data to identify the most likely crop type of each field in the study area. An iterative mode filter is then performed to clean up any speckling within the classification, before a final accuracy is assessed.

Over 4000 satellite images, each linked to hundreds of thousands of ground data points, are required to map Canada's entire agricultural extent annually and validate the resulting product. Hundreds of hours of computer processing time are required to do all the calculations to produce a final high-quality classification.

So far, AAFC can consistently deliver a crop inventory that meets the overall target accuracy of at least 85%. The annual crop inventory maps have already been applied by AAFC, the provinces, researchers and others to address many needs for the sector. AAFC freely shares the crop inventory data, and welcomes feedback from any of our users. For crop specific accuracies please contact: [Leander.Campbell@agr.gc.ca](mailto:Leander.Campbell@agr.gc.ca)

We acknowledge the following contributors:

Agricultural Financial Services Corporation, <http://www.afsc.ca>

BC Ministry of Agriculture, <http://www.gov.bc.ca/agri/>

Canadian Forest Service, <https://natural-resources.canada.ca/our-natural-resources/forests-forestry/the-canadian-forest-service>

Canadian Space Agency, <http://www.asc-csa.gc.ca>

Ducks Unlimited Canada, <http://www.ducks.ca/>

Earth Resources Observation & Science (EROS) Center, of the U.S. Geological Survey, <http://eros.usgs.gov>

La Financière agricole du Québec, <http://www.fadq.qc.ca>

Ontario Ministry of Agriculture, Food & Rural Affairs, <http://www.omafra.gov.on.ca/>

PEI Department of Environment, Water and Climate Change, <https://www.princeedwardisland.ca/en/topic/environment-water-and-climate-change>

Manitoba Agricultural Services Corporation, [www.masc.mb.ca](http://www.masc.mb.ca)

Saskatchewan Crop Insurance Corporation, <http://www.saskcropinsurance.com>

Statistics Canada, <http://www.statcan.gc.ca>

## 8. DATA MAINTENANCE

Data Series: Updated annually

Individual Datasets: Not Planned.

## 9. PORTRAYAL

Not applicable.

## 10. DATA PRODUCT DELIVERY

TIF

format name: Tag Interleaved File:

version: 6.0

specification: GeoTIFF is format extension for storing georeference and geocoding information in a TIFF 6.0 compliant raster file by tying a raster image to a known model space or map projection.

languages: eng

character set: utf8

## 11. METADATA

The metadata requirements follow the Government of Canada's Treasury Board Standard on Geospatial Data (ISO 19115).