Farm Management Survey, 2021

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Environmental practices on Canadian farms

The Farm Management Survey is conducted every five years as a follow-up to the Census of Agriculture. The subjects covered are varied but can generally be linked to the environmental impact of the Canadian agriculture sector. The latest release of the Farm Management Survey focuses on whether Canadian farms are progressively adopting more sustainable practices.

Soil testing and targeted or varied fertilizer application on farms: A winning combination

Variable-rate input application is a technology that relies on farm equipment with global positioning system (GPS) to regulate seeding or crop input application (fertilizer, pesticides, manure, etc.) across a field depending on specific plant needs. The best way to identify nutrient needs is to test the soil. Soil testing measures key elements in the soil (e.g., phosphorus, potassium and calcium) to assess their availability to plants and identify specific nutrient needs to be addressed by applying fertilizers. Together, annual soil testing and varied fertilizer application can improve nitrogen use efficiency and reduce greenhouse gas (GHG) emissions.

In 2021, 94% of field crop (oilseed, grain and pulse) farms that applied fertilizer tested their soil for nutrient content and varied their fertilizer application rate. This represents a 4% increase compared with 2017. Among these farms, 42% tested their soil every year. For forage crop (hay, silage and pasture) farms that applied fertilizer, 66% tested their soil and varied their fertilizer application rate, down 1% from 2017. However, 16% of these farms tested their soil every year, up 1% from 2017.

Global positioning system equipment is most used as a tracking or guidance system (such as auto-steer)

In addition to targeted or varied fertilizer application, GPS technology can be used in a variety of ways by farms to improve the accuracy of input application and maximize yields. In 2021, GPS equipment was most used as a tracking or guidance system (such as auto-steer), with 92% of field crop farms and 85% of forage crop farms using GPS equipment for this purpose. The activities commonly automated using this technology in 2021 were seeding and pesticide spraying.

Use of crop management techniques on the rise

Various crop management techniques can be used to increase yields and improve overall soil health. For example, fall or winter cover crops (such as red clover or fall rye) can be planted in between cash crops (income-generating crops such as wheat or soybeans) during the late summer or early fall to cover the bare soil and protect it from wind or water erosion. Another technique involves planting two or more non-competing crops or companion crops at the same time in the same field to assist each other in nutrient uptake, pest control and protection against weeds. Finally, green manure crops (such as buckwheat) can be planted with the purpose of incorporating their biomass into the soil before they reach maturity, for added nutrients and erosion protection.

In 2021, 24% of Canadian field crop farms used companion crops, fall or winter cover crops, or green manure crops as a land management practice, up 2% from 2017. Almost one-half (49%) of field crop farms in Quebec used one of these crop management techniques, up from 38% in 2017.

Manure application on farms continues to be a sustainable alternative to commercial fertilizers

The increased use of manure, compost or digestate as a fertilizer on crops has the potential to reduce agricultural GHG emissions by 10% to 20%. Overall, manure application on field and forage cropland remained stable from 2017 to 2021. When it came to the most common manure type applied to crops, dairy farms that applied liquid manure on their field crops rose 2% from 2017 to 2021, to reach 30%. Field crop farms that applied solid manure on their field cropland also increased 2%, reaching 20% in 2021.

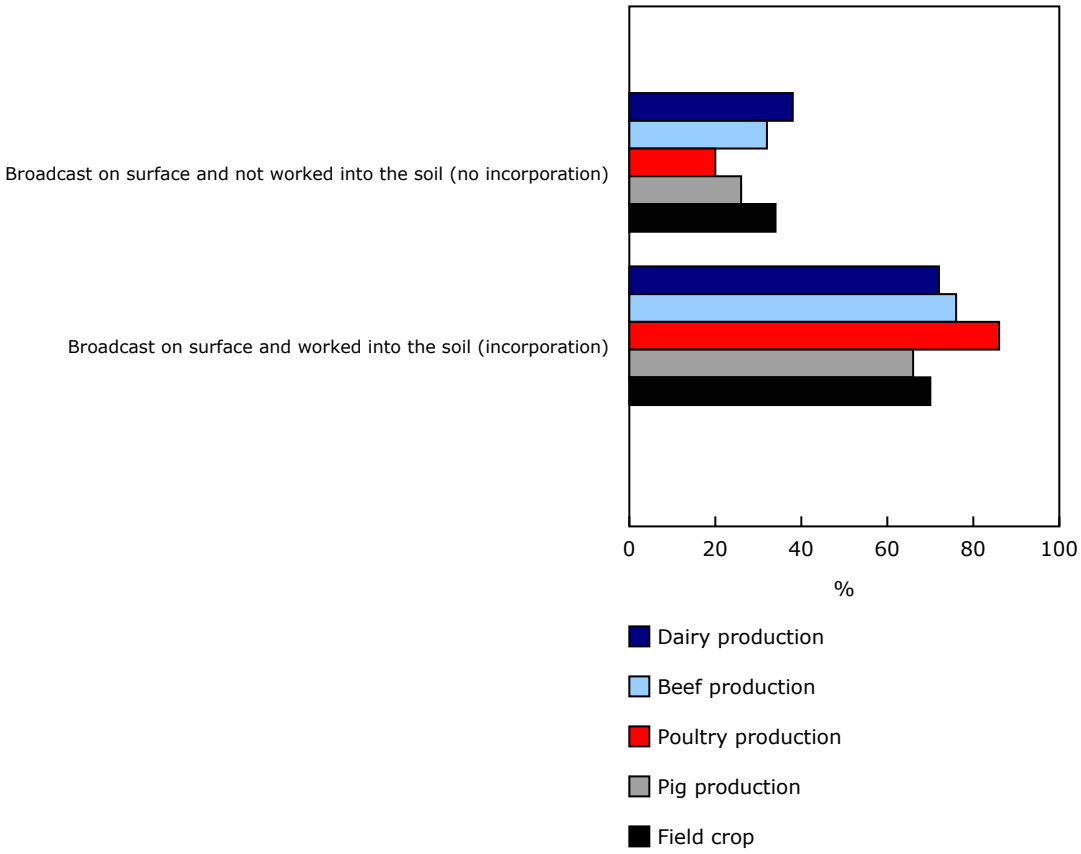
Table 1
Manure applied to field and forage crops, by farm type, Canada, 2017 to 2021

	Manure applied to field crops		Manure applied to forage crops	
	2017	2021	2017	2021
	%			
Farm type				
Dairy production	38[A]	38[A]	52[A]	46[A]
Beef production	28[A]	24[B]	18[B]	18[B]
Poultry production	38[A]	36[A]	6[C]	4[C]
Pig production	56[A]	46[A]	8[C]	10[C]
Field crop production	34[A]	34[A]	...	...
Forage crop production	...	...	52[A]	46[A]

... not applicable
A data quality: excellent
B data quality: very good
C data quality: good
Source(s): Table **32-10-0388-01**.

In terms of the method of manure application on field cropland in 2021, the preferred method was broadcasting with incorporation. This method involves mixing the manure into the soil, greatly reducing runoff and increasing nutrient availability.

Chart 1
Method of manure application on field crops, by type of farm, Canada, 2021



Note(s): The sum of percentages may not add up to 100 because respondents could select more than one answer.
Source(s): Table 32-10-0388-01.

Majority of field crop farms rotate their crops

Crop rotation is a sustainable land management practice that can increase biodiversity, reduce soil erosion and improve crop yields with increased availability of soil nutrients for crops. In 2021, 96% of field crop farms rotated their crops.

In 2021, nearly two-thirds (65%) of field crop farms that rotated their crops used a rotation sequence that was not always the same every year.

During the same period, 31% of field crop farms rotated their crops using the same sequence each year. Of those, 31% contained a rotation sequence with a pulse crop. Pulse crops include soybeans, lentils, chickpeas, dry field peas, dry white beans and other dry beans. The increased use of pulse crops in crop rotation sequences can improve nitrogen use efficiency and reduce GHG emissions.

Note to readers

The Farm Management Survey

The Farm Management Survey (FMS), conducted every five years, is a collaborative project between Statistics Canada and Agriculture and Agri-Food Canada.

The FMS contributes to Agriculture and Agri-Food Canada's work on measuring selected management practices in the agriculture sector. The information generated from this survey informs federal and provincial policy decisions in the sector.

FMS data were collected using a sample of 18,000 farms selected to be representative of 81% of Canadian production of dairy cows; beef; poultry; pork; field crops; forage crops; and fruit, vegetable, berry and nut crops. Small farms were automatically excluded, and large ones were considered "must take" because of their national influence on farm practices.

The survey aims to produce estimates for seven farm types at both the provincial and ecological region levels. Each respondent filled out the questionnaire for only one of these commodities based on the significance of their production nationally and within their region. Data from the Census of Agriculture were used to identify the importance of each farm's production.

Methodological information

Further information on the Farm Management Survey is available.

Previous publications

Further analysis can be found in the Farm Management Survey release from December 15, 2022.

Available tables: 32-10-0205-01 to 32-10-0209-01 , 32-10-0211-01 and 32-10-0385-01 to 32-10-0388-01 .

Definitions, data sources and methods: survey number 5044.

For more information, or to enquire about the concepts, methods or data quality of this release, contact us (toll-free 1-800-263-1136; 514-283-8300; **infostats@statcan.gc.ca**) or Media Relations (**statcan.mediahotline-ligneinfomedias.statcan@statcan.gc.ca**).