2023 Cover Crop and Sustainability Survey Results

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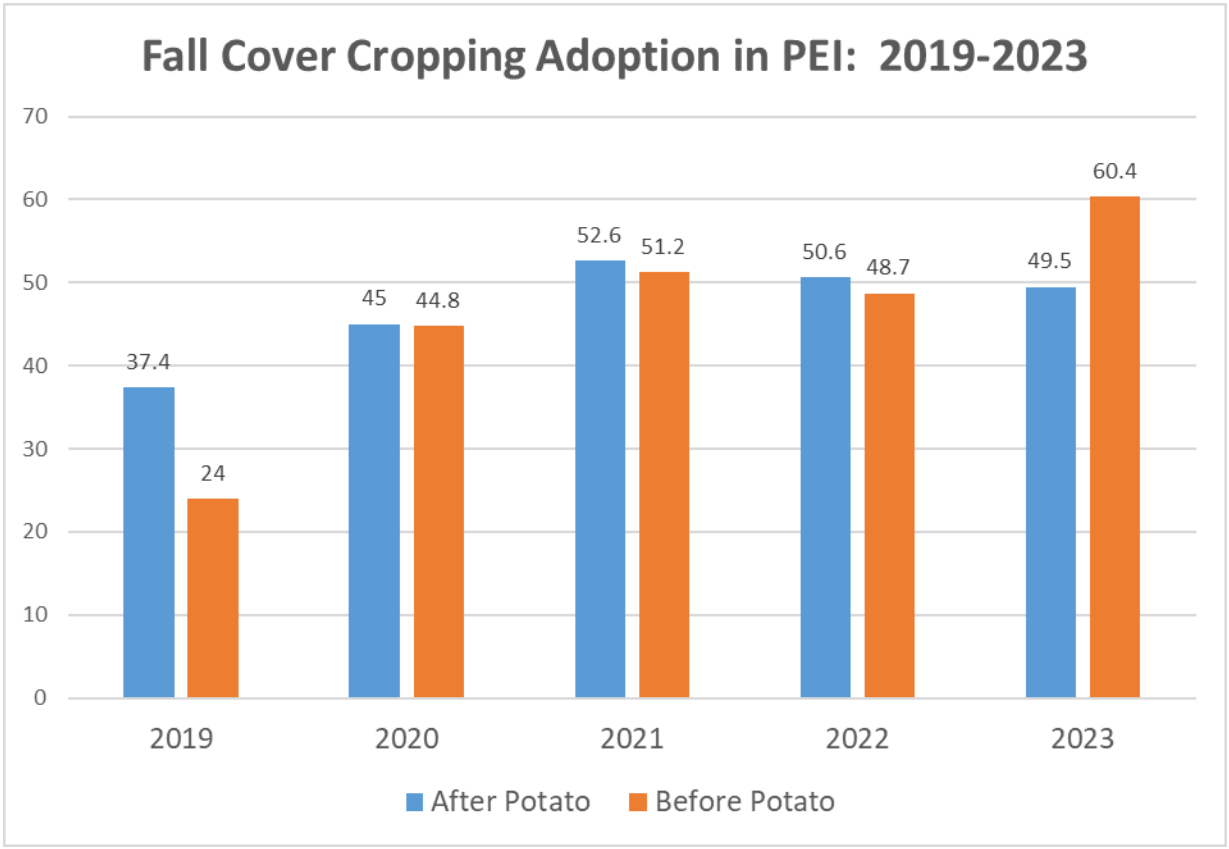
In December 2023, the PEI Potato Board launched the fifth annual survey of PEI potato producers to assess the level of adoption of fall cover cropping and other sustainability practices on the Island. Response was strong, with 52 farms responding to the survey. These 52 farms indicated that they grew a total of 31,867 acres of potatoes in 2023, representing 37.7% of the 84,500 acres of potatoes planted in PEI in 2023, as reported by Statistics Canada. This response rate is similar to the last three years of the survey. Given the range in farm sizes and the geographic distribution of the farms responding, we feel that the survey results are a reasonably representative sample of PEI potato farms.

The average number of potato acres grown among the 52 responding farms was 613, with a minimum of 50 acres and a maximum of 2400 acres. The largest number of responses were from East Prince County (36% of responses), which also home to the largest number of potato acres in PEI. 22% of the responses were from West Prince, 20% from Northern/Eastern Kings, 12% from West/Central Queens, and 10% from Eastern Queens/South Kings.

Fall Cover Crop Establishment:

Figure 1: Fall cover cropping adoption on PEI potato farms (2019-2023)



Based on survey results, 49.5% of potato acres were seeded with a cover crop in 2023. The rate of cover cropping was slightly higher on the larger acreage farms (> 800 acres) than on the small acreage farms (<

800 acres). This rate is similar to the rate that we have seen over the last few years. Late harvest in 2023 due to weather conditions likely limited the opportunity to establish cover crops for longer season potato varieties.

The percentage of acres destined to be potatoes next year that had a green cover crop established increased in 2023 to 60.4% from 48.7% in 2022. We have seen an upward trajectory for the use of fall-seeded cover crops ahead of potatoes since starting this survey, as seen in Figure 1. Interestingly, there is a marked difference in cover cropping among different sizes of farms. For farms planting 50 to 400 acres of potatoes, the cover cropping rate before potatoes was only 37%, compared with 49% for farms growing 401 to 800 acres of potatoes, and 73% for farms growing more than 800 acres of potatoes.

One reason for this marked difference may be due to a difference in primary tillage equipment. We asked producers to indicate what percentage of primary tillage they did using either a moldboard plow, a vertical tillage implement (Lemken, Pottinger, etc), or a chisel plow or other tillage implement. Across all farms, vertical tillage was used on 49.5% of acres, compared with 36% moldboard plow and 14.5% chisel plow/other. However, these averages were much different depending on the number of potato acres grown. Among farms growing 50 to 400 acres of potatoes, moldboard plow averaged 71% compared with 26% for vertical tillage. For farms growing more than 800 acres of potatoes, vertical tillage averaged 63% of acres, compared with 19% for moldboard plow and 18% for chisel plow/other. As larger acreage farms have moved more toward vertical tillage implements, many of these implements are modified to be able to plant the cover crop at the same time as tillage, eliminating a separate pass and saving time and money for the producer. This may be a reason why we see higher adoption rates of cover cropping ahead of potatoes for larger producers.

New to the survey this year was a question asking producers to rank different reasons why planting cover crops can be a challenge on their farm. The reason with the highest weighting was that it is often too late in the season for reliable establishment of cover crops (4.84 out of 6). The next highest weighted reasons were “not enough time or human resources” (4.71) and “high cost of seed and establishment” (4.18). Lower rated reasons were “weather conditions have been difficult for cover crop establishment” (3.37); “worried about regrowth/termination of cover crops” (2.55), and “I see cover crops as unnecessary (1.35). It’s encouraging to see that growers generally see cover crops as a worthwhile investment, but these results demonstrate the continued need to find later-establishing cover crop species and well as helping producers with the cost of establishment, particularly for post-potato harvest cover crops which have a limited time frame to grow.

Rotation Crops:

Once again this year, we asked growers to share what other crops they are growing in rotation with potatoes. These results are summarized in the table below:

Rotation Crop	# of acres	as a % of potato acres	# of responses
Grains	25,144	78.9	50
Pulses (peas)	3,020	9.5	15
Soybean	1,439	4.5	20
Corn	1,451	4.6	19
Mustard	1,790	5.6	14
Buckwheat	3,250	10.2	13

Sudangrass/Pearl Millet	4,461	14.0	23
Alfalfa or Alfalfa/Grass	6,662	20.9	28
Red Clover or Clover/Grass	5,120	16.1	24
Other Forage Mixes	5,786	18.2	22
Other Cash Crops	243	0.7	12
Oilseed or Tillage Radish	3,320	10.4	17
Other (multi-species mixes)	1,655	5.2	13

Results from 2019 to 2023 are show below:

	acres as a percentage of potato acres				
Rotation Crop	**2019**	**2020**	**2021**	**2022**	**2023**
Grains	75.1	72.3	71.5	82.4	78.9
Pulses	4.5	11.4	3.9	2.0	9.5
Soybean	6.9	6.2	8.3	5.8	4.5
Corn	8.2	6.2	8.6	8.1	4.6
Mustard	5.7	15.1	4.2	6.3	5.6
Buckwheat	5.8	6.7	6.5	3.2	10.2
Sudangrass/Pearl Millet	16.4	17.4	21.4	14.4	14.0
Alfalfa or Alfalfa/Grass	9.8	14.8	18.0	21.6	20.9
Red Clover or Clover/Grass	22.2	13.6	12.7	15.6	16.1
Other Forage/Multi-Species	24.0	22.8	19.9	21.7	23.4
Other Cash Crops	1.9	1.3	2.2	1.3	0.7
Radish (Oilseed/Tillage)			2.0	4.2	10.4

It should be noted that this question on the survey, while remaining very similar each year, often displays some level of inconsistency in responses. Responses from one or two farms with large acreages of a single crop can skew the numbers significant in one year (ie. mustard in 2020, buckwheat in 2023). As well, not all crops grown in potato rotation are always captured, as there are a number of growers with "in and out" rental agreements that don't control the rest of the crops in rotation, so some growers may not have included that information. However, a few trends are evident:

- The number of grain acres in the last two years has ticked up, possibly due to stronger grain prices.
- Alfalfa acreage has doubled in five years, due in part to its ability to help fight soil compaction while also being a strong nitrogen fixing crop.
- Red clover acreage has decreased slightly.
- Use of other forage or multi-species mixtures has remained consistently popular.
- The use of full-season radish crops has increased significantly in the last two years.
- Use of sudangrass and pearl millet may have fallen back a bit after a quick rise in acreage. However, use of these tropical grasses may also be part of the "other forage mixes" category, so it is hard to make any strong conclusions on total acreage.

Additional Sustainability BMPs

- There has been a sustained trend toward performing **hilling at the time of planting** as opposed to the traditional practice of row-shaping two or three weeks after planting. 57% of respondents now do hilling at planting for the majority of their acres. While producers like getting this done in one pass, there are concerns from some that hilling at planting requires the herbicide program to be very effective. In addition, there are some concerns about excess greening on basket-formed hills for some varieties. Nonetheless, the simplicity of having hilling done at the same time as planting, with the ability to apply early pre-emergence herbicides is very attractive to many producers.

- 40% of respondents indicated that they used **slow-release or protected nitrogen sources** on their crop in 2023, with a further 50% indicating that they are interested in doing so in the future. Given the current attention on greenhouse gas (GHG) emissions and reducing emissions from fertilizer use, it would seem that there is considerable appetite to increase use of these nitrogen product which reduce nitrogen losses.

- 21.6% of respondents indicated that they are interested in partnering with a livestock farm to do **rotational grazing** in potato rotations, with another 17.7% indicating that they are already working on this. There seems to be considerable interest in further exploration of rotational grazing, particularly for producers that already grow forages, that already partner with livestock farms, or that already have livestock themselves.

- We asked producers who they trust the most to provide them with **agronomic advice**. The most trusted source was independent agronomists hired by the farm, but not all farms retain the services of independent agronomists. The percentage that did indicate trust in independent agronomists (~70% of respondents) was higher than expected, given the small number of people working as such in PEI. Next highest in level of trust were the Potato Board Agronomy Team, agronomists with service providers/buyers, and members of the on-farm team (employees or farm managers). Further down the trust matrix were staff from the PEI Department of Agriculture and Agriculture and Agri-Food Canada.

We would like to thank all producers who completed the survey in 2023 as well as in previous years. A healthy completion rate gives us increased confidence in the accuracy of our results. No individual survey responses are shared with anyone, and the results of this survey are shared back to producers and industry partners to inform future research and agronomy projects as well as reflect the investment in sustainable practices being made by PEI potato producers.