Cover Crop Demonstration Trial

Delta Farmland & Wildlife Trust

2025-2026

Objectives

The purpose of the trial was to demonstrate and compare how several types of cover crops grew on a farm field in the Sumas prairie, Abbotsford, BC. Cover crops were selected that would grow quickly, provide ground cover rapidly, compete with weeds, add diversity and fit into annual vegetable cropping systems. An additional goal was to see if the cover crop varieties would experience different levels of waterfowl grazing. Twenty-two types of cover crops were grown, including cereals, brassicas, legumes, other floral species, and mixtures.

Methods

The trial took place on a vegetable farm in the Sumas prairie. The area has Sumas soils, which are mostly loamy sand and this field was particularly sandy. The previous cash crop grown on the field was carrots. Most of the residue was removed, and the field was tilled before seeding. The two seeding dates were compared: Sept 15 and Oct 1, 2025. Twenty-two plots were seeded at the earlier date, and 14 of the same varieties were seeded again on Oct 1. The plots were seeded with a plot seeder, with seeding rates based on recommended rates. Plots measured 5' x 60'. The cover crops were irrigated twice in the fall. Plant height, percent cover, and degree of grazing were assessed throughout the winter. Percent cover was assessed using three 0.25m^2 quadrats per plot. Results are the average of three measurements taken from each plot. This trial was done for demonstration purposes and was not replicated.

Cover Crop Varieties

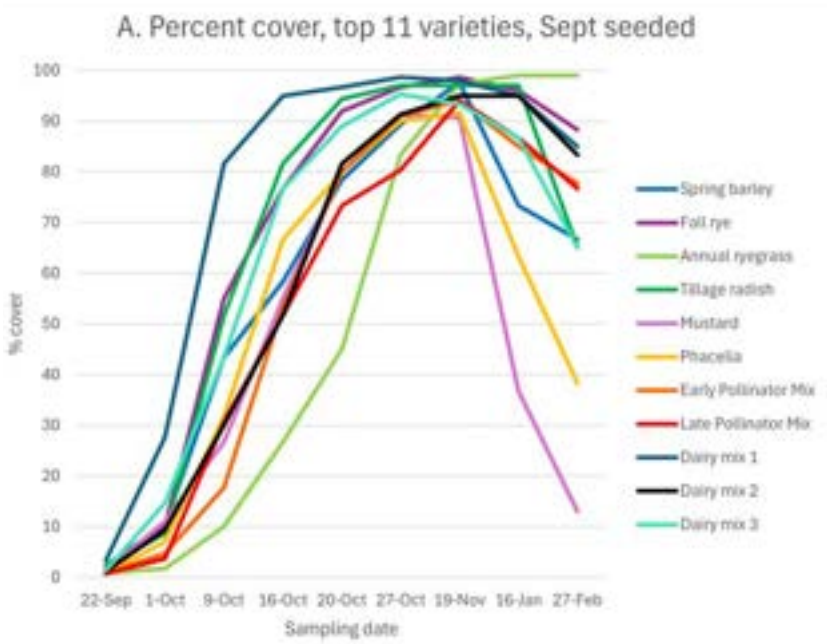
Cover Crop	Seeding date	Seeding rate, lb/ac	Seed cost per acre
Spring Barley AB Advantage	Sep 15th, Oct 1st	125	$62.50
Spring Oats AC Morgan	Sep 15th, Oct 1st	125	$56.25
Spring Triticale Common No.1	Sep 15th, Oct 1st	125	$281.25
Winter Wheat Common No.1	Sep 15th, Oct 1st	125	$56.25
Fall Rye Common No.1	Sep 15th, Oct 1st	125	$56.25
Annual Ryegrass Kodiak, Westerwold type)	Sep 15th, Oct 1st	25	$46.25
Purple Top Turnip	Sep 15th	5	$15.90
Vivant Hybrid Turnip	Sep 15th	5	No data
Tillage Radish Taper Brand	Sep 15th, Oct 1st	10	$33.40
Yellow Mustard Common No. 1, *Sinapis alba*	Sep 15th	10	$30.15
Crimson Clover	Sep 15th	18	$53.35
Austrian Winter Peas	Sep 15th	100	$113.86
Fava Beans	Sep 15th, Oct 1st	150	$154.50
Black Oil Sunflower	Sep 15th	100	$140.18
Super Bee Phacelia	Sep 15th	7	$75.60
Tillage radish & barley: 88% barley, 12% radish	Sep 15th, Oct 1st	35	No data
Early Pollinator Mix: 60% Faba bean, 25% Black oil sunflower, 5% Roquette arugula, 5% Twister hybrid turnip, 5% Phacelia	Sep 15th	40	$60.00
Late Pollinator Mix: 50% fava beans, 30% spring barley, 4% purple top turnip, 10% spring oats, 6% vivant hybrid turnip	Sep 15th, Oct 1st	40	$60.00
Fall Rye Pea Vetch Mix: 70% fall rye, 20% Austrian winter peas, 10% winter vetch	Sep 15th, Oct 1st	75	$87.15
Dairy Mix 1: 50% winter wheat, 25% Italian ryegrass, 10% turnip, 15% tillage radish	Sep 15th, Oct 1st	110	$233.20
Dairy Mix 2: 40% annual ryegrass, 20% hairy vetch, 20% renegade d/c red clover, 20% tillage radish	Sep 15th, Oct 1st	40	$128.00
Dairy Mix 3: 20% annual ryegrass, 18% crown millet, 12% crimson clover, 15% hairy vetch, 10% tillage radish, 10% purple top forage turnip, 5% brassica, 5% forage kale, 5% sugar beets	Sep 15th, Oct 1st	40	$124.18

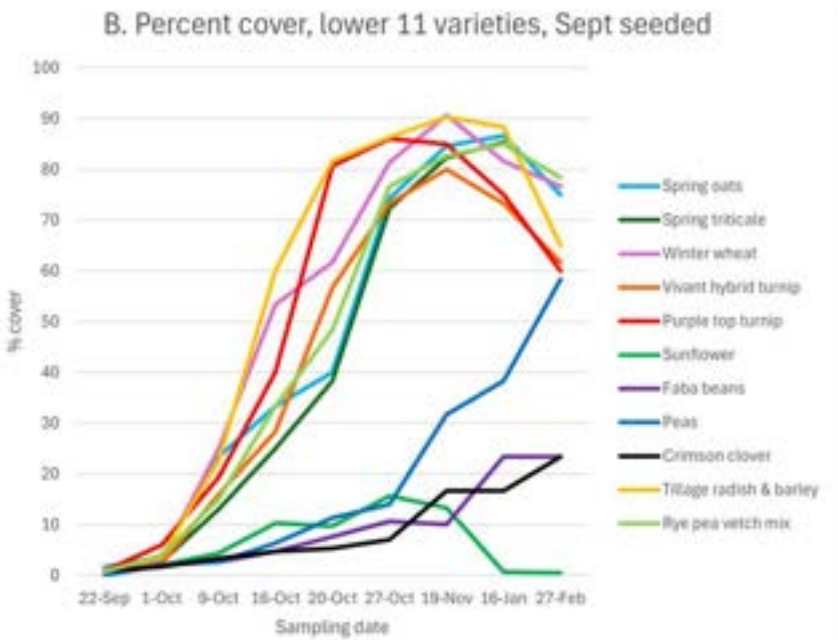
**Many of these varieties, such as sunflowers, phacelia, the brassicas, and legumes, would generally be grown in mixes. We grew them individually to demonstrate how they grow but would typically recommend including them in mixes (which would also lower the seeding rate and cost).*

Results

Fastest Growing Varieties: Most of the varieties seeded in mid Sept grew well and achieved at least 80% cover. Of the cover crops seeded mid Sept., the varieties that achieved at least 85% cover, starting with highest cover:

- Annual ryegrass
- Fall rye
- Dairy mix 1
- Spring barley
- Tillage radish
- Dairy mix 3
- Dairy mix 2
- Ealy pollinator mix
- Late pollinator mix
- Phacelia
- Mustard
- Winter wheat
- Tillage radish and barley
- Spring oats
- Purple top turnip
- Spring triticale
- Rye pea vetch mix





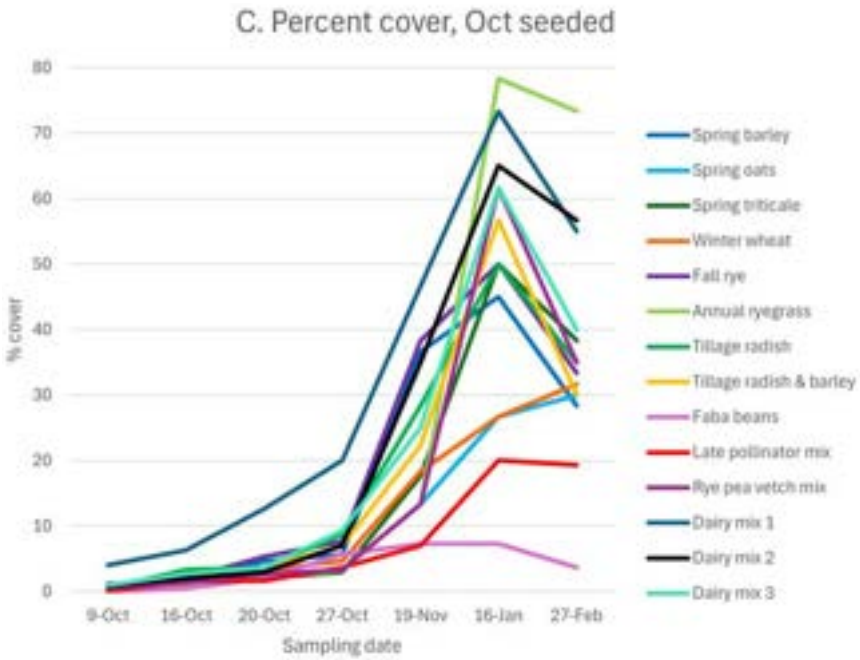
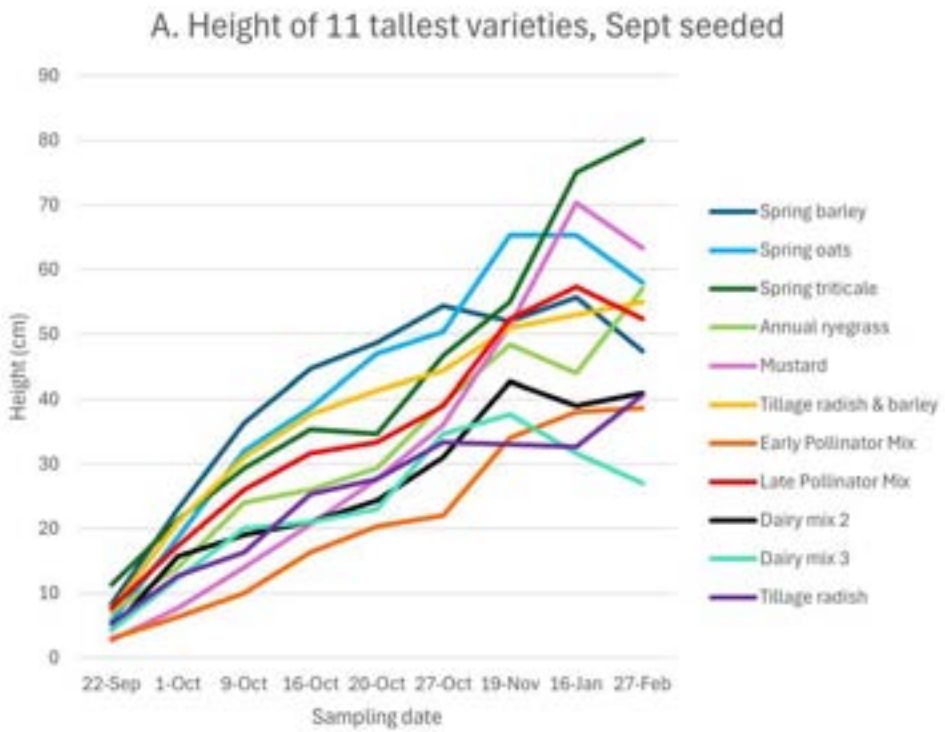


Figure 1. Percent cover of cover crop foliage throughout the season: A. shows percent cover of the 11 varieties that grew the fastest, B. shows the 11 varieties that grew more slowly, all seeded Sep 15, and C. shows the varieties planted Oct 1. Note that the number of days between sampling dates is not consistent, with the last three sampling periods being farther apart.

Varieties that grew more slowly: Only four of the Sept seeded varieties achieved less than 80% cover. These were (from highest to lowest cover): Austrian winter peas, faba beans, crimson clover, and sunflower. These all had spotty germination which left bare patches in the plots.



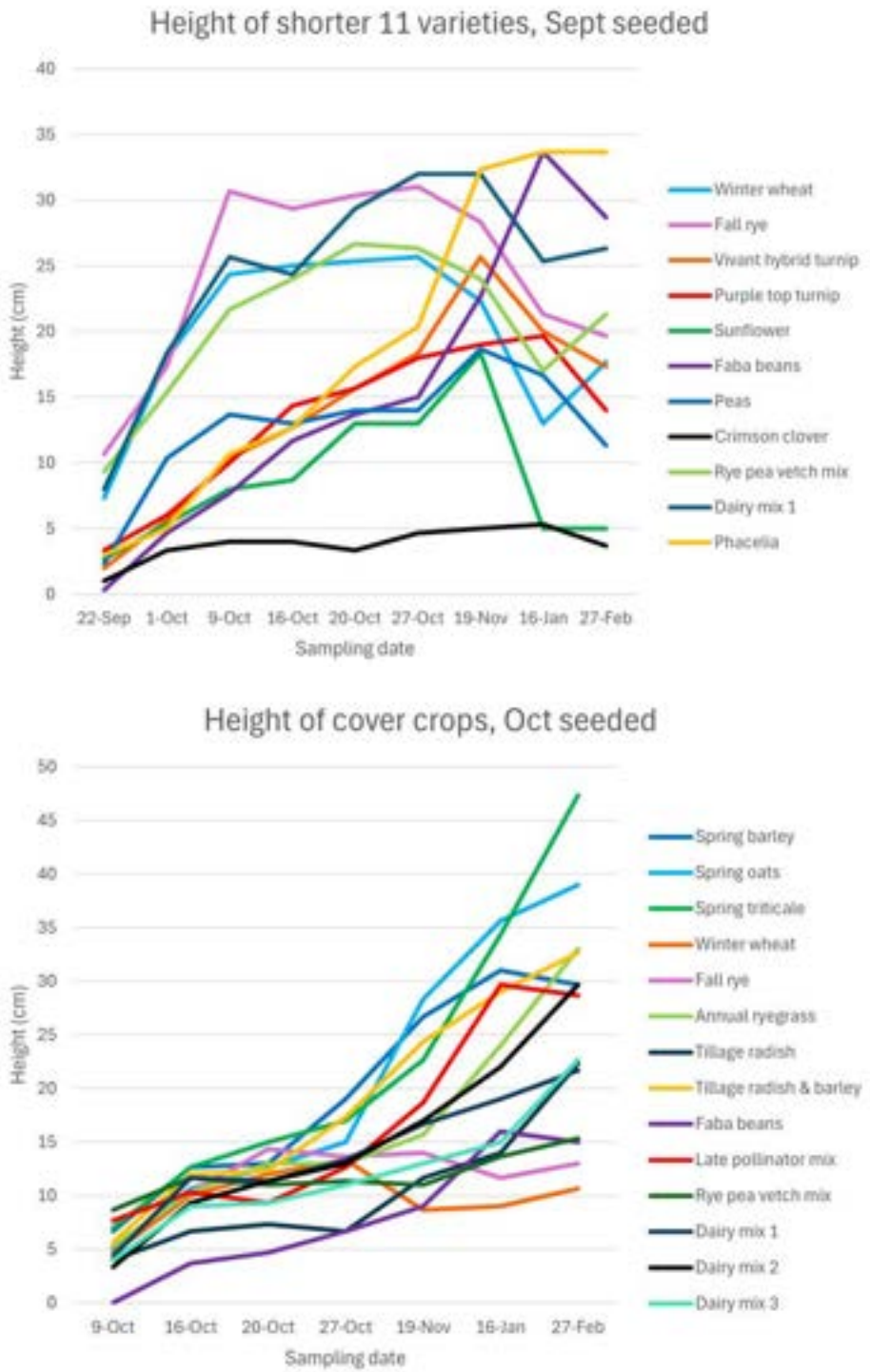


Figure 2. Cover crop height over the season: A. shows height of the 11 varieties that grew the tallest, B. shows the height of the 11 shorter varieties, all seeded Sep 15, and C. shows the varieties planted Oct 1. Note the number of days between sampling dates is not consistent, with the last three sampling periods being farther apart.

The October seeded plots grew much less than the earlier seeded plots, in terms of both height and cover and as seen clearly in the field. None achieved 80% cover, while only 5 out of 14 had more than 60% cover over the course of the winter. These included the dairy mixes, which were seeded at a high rate leading to very dense brassica cover, as well as annual ryegrass and the fall rye-pea-vetch mix. The spring cereals grew the tallest of the Oct seeded options.

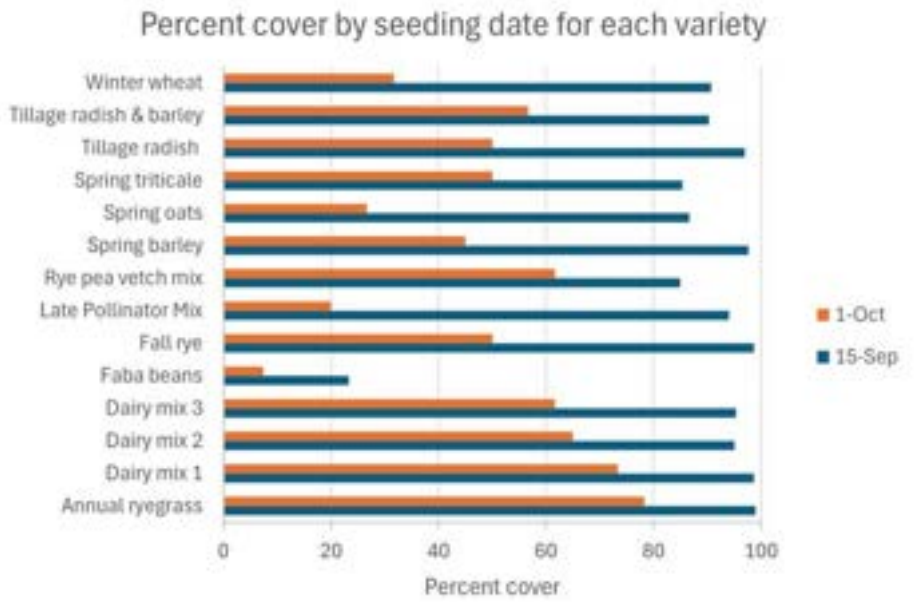


Fig 3. Highest percent cover of each variety seeded Sep 15 and Oct 1.

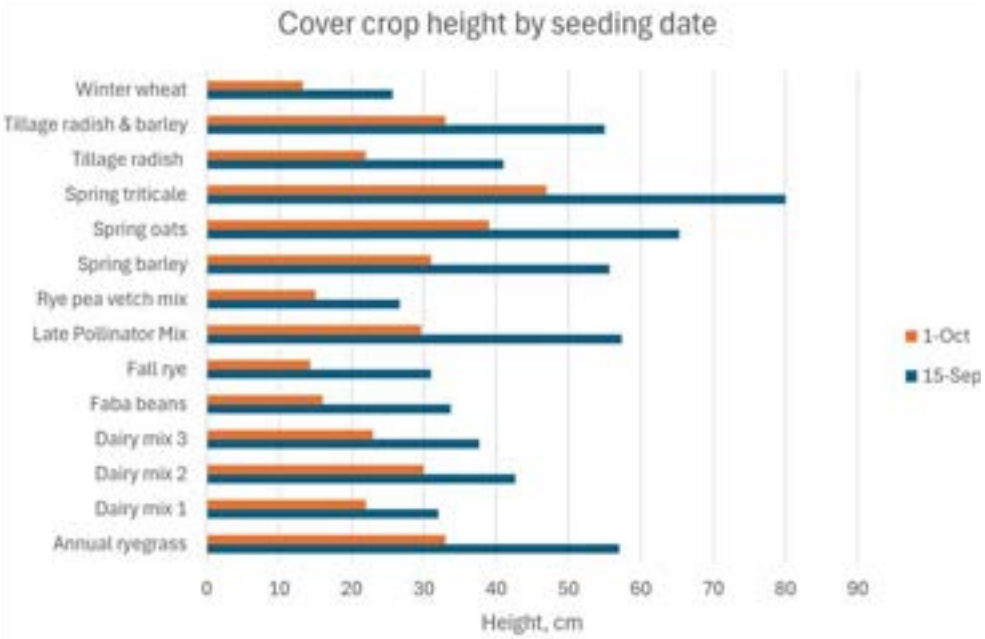


Figure 4. Height of cover crop varieties seeded Sep 15 and Oct 1.

January observations

- Of the 3 spring cereals (seeded in Sept), the barley was yellowing a bit and looked the worst, with oats looking better and triticale the tallest and greenest.
- The tillage radish was thicker and doing better than the other brassicas.
- In the early pollinator mix, the phacelia and fava beans were the tallest species, with the brassicas being shorter.
- The mustard was losing its lower leaves but still green and upright.
- Only the sunflower had completely winter killed, and almost no residue was remaining.

Late February observations

- The plots were terminated with herbicide in late Feb and measured for the last time on Feb 27.
- The winter was very mild, and only the sunflowers had completely winter killed, with residue almost gone. The barley was mostly brown with only bits of green remaining, while all the other winter cereals were still green. The legumes remained fairly small and patchy through the end of the season. The mixes in general had good cover and growth.

No waterfowl grazing was observed at this site. Weed growth was minimal throughout the plots and mostly made up of carrot re-growth.

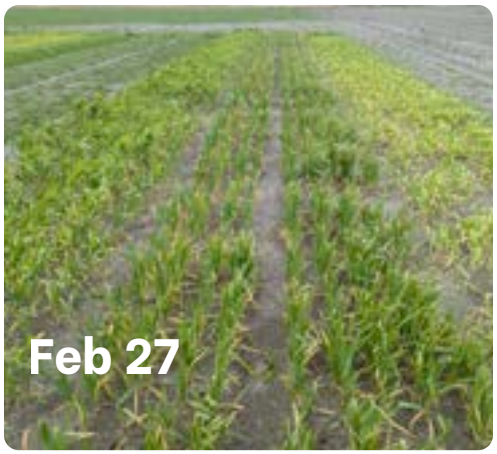
Spring Cereals, seeded Sept 15

Oats centre, barley to the right, triticale to the left.

Oats centre, barley to the right, triticale to the left.

Barley in foreground (brown), oats to the left, triticale farther left (taller).

Spring Cereals, seeded Oct 1



Oats centre, barley to the right (yellower in later pictures), triticale to the left.

Winter cereals and annual ryegrass, seeded Sept 15

Fall rye centre, winter wheat to the right, annual ryegrass to the left (taller).

Winter cereals and annual ryegrass, seeded Oct 1

Fall rye centre, winter wheat to the right, annual ryegrass to the left (taller)

Annual ryegrass foreground, fall rye to the right, winter wheat farther right.

Fall rye centre, winter wheat to the right, annual ryegrass to the left (taller)

Brassicas, seeded Sept 15

Purple top turnip centre left, vivant hybrid turnip centre right, tillage radish far right, mustard far left.

Purple top turnip centre, mustard right, vivant hybrid brassica left, tillage radish far left.

Legumes, Oct 27 (seeded Sept 15)

Legumes, Feb 27 (seeded Sept 15)

Favas left, peas centre, crimson clover to the right, Feb 27

Fall (seeded Sept 15)

Feb 27 (seeded Sept 15)

Mixes, fall

Mixes, Feb 27

October seeded plots

Dairy mixes in foreground

Dairy mixes

Rye/pea/vetch mix in foreground, late pollinator mix to the right, then favas

Thanks to Sam Malamura for hosting the trial. Thanks to Brent Harris for sharing seed for the pollinator mixes and the seed sourced from Green Cover. Thanks to Pacific Forage Bag for providing a discount on seed, and thanks to Gary Telford and Derek Hunt for help with seeding.

To learn more about the BC Living Lab, visit www.bclivinglab.ca. This field trial was funded, in part, by Agriculture and Agri-Food Canada through the Agricultural Climate Solution – Living Lab program and On-Farm Climate Action Fund.