

FARMER-RESEARCHER

Becky Porlier
The Colour Farm

The Colour Farm is located in Callander within the boreal forest, near the shores of Lake Nipissing on the lands of the Anishinabek, Nipissing, and Algonquin peoples. Currently the Nbisung Anishinaabeg, of Ojibway and Algonquin descent, have 11 communities within the Nipissing First Nation.



RESEARCH REPORT 2021

No-till sunflowers in northern Ontario

IN A NUTSHELL

Becky's goal was to see if it was possible to establish land for cut flower production on existing perennial pastures using no-till methods.

- Poor germination across her replicated trial comparing cover crop mulch, deep compost mulch and tillage (control) resulted in no appreciable results to note.

- Becky had good luck growing sunflowers in two demonstration plots that she tarped for 12 months and 2 months.
- Becky recommends using tarps for 2-12 months ahead of planting into perennial pasture.

This trial was funded by FedNor and through the Living Lab-Ontario project to help support knowledge transfer of innovative practices. Funded by Agriculture and Agri-Food Canada (AAFC), this initiative has farmers and federal scientists from AAFC and Environment and Climate Change Canada studying soil health and water quality on real farms.



Researcher Becky with family Guy Porlier, Emeric and Severine in the sunflower patch.

MOTIVATION

Sunflowers are a staple late summer, early fall crop that is very popular as a cut flower at local markets (**Photo 1**). They make up a significant part of The Colour Farm's total crop production and income, as they are very reliable, prolific, easy to grow, and beautiful.

Becky is interested in reducing or eliminating tillage and wonders if she can maintain marketable yields of sunflowers with a no-till system. For The Colour Farm, 2020 marked the first growing season at a new property where the soil has not been tilled in the past 30 years, and until 2012, was horse pasture. The fields have been mowed continually since 2012, except in 2019. Turning permanent, long-term pasture into cultivated land poses an interesting challenge with perennial wild grasses to deal with.

METHODS

The soil type for this trial was a sandy loam on rocky Canadian Shield bedrock.

Occultation for 12 months

Demonstration Plot
In spring 2020, Becky started her investigation with a 15' x 30' demonstration plot where she lay silage tarps from Dubois

Agrinovation directly onto perennial pasture (**Photos 2 & 3**). Initially she tried securing the tarps with irrigation pegs, but found they didn't work well, and changed to burying the edges or using sandbags. She left the tarps until spring 2021, when she removed them and direct-seeded sunflowers.

Occultation for 2 months

Demonstration Plot
In April 2021, Becky prepared another section of her garden with tarps and left them on for two months, after which she transplanted sunflowers.



Photo 1. Stunning bouquets with sunflowers, ready for market!

Cover crop mulch and deep compost mulch in green

Attempted replicated trial

In 2021, Becky also initiated a randomized, replicated trial with three treatments: tillage (control), cover crop (spring tillage before seeding a cover of oats and then mowing at base to terminate for mulch), and deep compost mulch (4"). Each treatment had six replicates, for a total of 18 3'x25' beds with a 1' walkway between.

Overall, Becky observed poor germination across all replicate beds and treatments. Even with overseeding, Becky suspects the seeds didn't have enough moisture, were unable to penetrate the soil to the right depth with her Earthway seeder, and were eaten by birds, rodents, etc. For this reason, we were not able to run statistics on the replicated treatments.

Seeding

Becky's original plan was to start trays of sunflowers in the greenhouse and transplant them to the trial areas (**Photo 4**). However, due to excessive seed predation in the greenhouse, Becky direct-seeded on May 13, 2021 into the 2020 occultation demonstration plot and the replicated trial area. (Rodents, chipmunks specifically, love sunflower seeds, you know!)

She then successfully seeded and transplanted into the 2021 occultation demonstration plot.. Becky notes that seeding 70x72 trays and transplanting the seedlings into the field was very labour intensive and required additional help.



Photo 2. Perennial pasture site for demonstration of occultation using tarps applied 2020.



Photo 3. Tarp establishment on perennial pasture, May 25, 2020.



Photo 4. A member of Becky's team seeding trays of sunflowers for transplanting! Unfortunately, chipmunks ate a lot of the seeds while they were germinating in the greenhouse.



Photo 5. Peek under the tarp, July 2020. The grass was dry and brown and there was an incredible amount of life on the surface of the soil. The roots were still firm and hard to pull.



Photo 6. Peek under the tarp, August 2020. The soil was moist and the remaining grass was pulling more easily. Becky found a snake skin, and observed the tarp as a great amphibian habitat in general. She remained impressed with the amount of life on the surface of soil under tarp.



Photo 7. Second peek under the tarp, August 2020. At this point, the grass had started to decompose and it could easily be pulled away by hand. Becky observed some new sprouts, which might have been due to holes in the tarp caused by deer walking on it and puncturing it.

FINDINGS

Observations from occultation for 12 months & direct seeding

- See **Photos 5-7**
- “A full year of tarping led to bare soil underneath”, and Becky observed “no plant debris at all” under the tarp.
- “Sunflowers germinated beautifully and grew very well. We had a nice crop of medium sized heads until the deer outsmarted the fence and ate all the sunflowers.” (**Photos 8 & 9**)

Observations from occultation for 2 months and transplanting

- This section had the same level of good weed control as the section tarped for a full year.
- Becky observed they “did the best [and produced] a full crop and nice sized heads a few weeks earlier than other growers.”
- This section was “not weeded at all. It could have been lightly weeded, but the weeds coming in were not as obnoxious as the replicate areas and the sunflowers outgrew them.”

Observations from cover crop, mulch and tilled sections

- See **Photos 10**
- “The tilled sections quickly became overrun with weeds. As did the compost sections. That came from a sheep farm and must have had a lot of dormant weed seed in it.”
- “The tillage + cover crop (oats) section was ok in [the sections that held moisture]. We had a month of drought in the spring that had a big impact on the cover crop. This section also became very weedy.”

CAVEATS

The cover cropped treatment may have done better with a different cool season early cover crop, or different spring growing conditions.

NEXT STEPS

While Becky is happy with how the tarps prepared land for production, the more she learns about and works with tarps, the more she’s not sure a full year of coverage is needed or wanted. Specifically, she would like to know more about whether a full year of tarping negatively impacts soil microbiology.

Moving forward, Becky is going to continue to use tarps for 4-8 weeks to weaken weeds and terminate cover crops for bed preparation. Although transplanting was labour intensive, she plans to transplant sunflowers in the early season and direct seed later in the season.



Photo 8. A bouquet of Becky's sunflowers.



Photo 9. Sunflowers growing in the section that was tarped for 12 months, with some heads snipped off by deer.



Photo 10. Becky used labeled buckets to keep sunflowers from each plot separate.

TAKE HOME MESSAGE

All in all, Becky had great luck using occultation with silage tarps and would recommend tarping to establish beds on pasture. The effectiveness of occultation is independent of precipitation, which makes it a more reliable method.