



WILD HOPE FARM

Types of No-Till

Introduction

- Conventional No-till: Uses chemical to kill cover crops/weeds
- Organic No-till
 - Mulch grown in place using a roller crimper to kill cover crops
 - Mulch/compost hauled in
 - Occultation



Why no-till?

Introduction

- Saves time
- Saves fuel
- Prevents erosion
- Builds soil organic matter
- Reduces weather related issues
- Reduces pest problems



Challenges to a no-till system

Introduction

- Timing
- Reduced options if it doesn't work out
- Weed and pest management
- Soil temperature
- Access to information
- Fertility integration



SARE 2020 Producer Grant

Part 1: Research Overview



Grant Contributors

Wild Hope Farm Crew:

Shawn Jadrnicek - farm manager

Rachel Klein - harvest manager

Sophia Friis - grant coordinator

Collaborators:

Mark Dempsey, CFSA Farm Services Manager

Southern SARE 2020 Producer Grant

Part 1: Research Overview



5 treatments:

1. Tilled, after sunn hemp
2. Sunn hemp, soybeans, buckwheat
3. Sunn hemp, millet, buckwheat
4. Sunn hemp, millet
5. Sunn hemp

Success metrics:

- Crop yield
- Bed weed coverage
- Labor hours

Presentation Contents

Introduction

Part 1: Research Overview & Video

Part 2: Treatment Selection & Performance

Part 3: Data & Reflection

Part 4: Strategies for next year

Part 5: Conclusion



Part 1: Research Overview



Pre-treatment Field Prep

Part 1: Research Overview

Year 1 (2019)

- One month fallow > x4 tillage operation
- Cover crop Sudex and Cowpeas planted early June
- Tillage > cover crop > cereal rye and crimson clover planted October



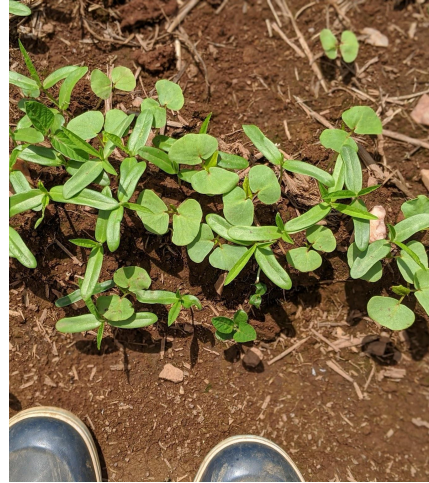
Key Dates: Year 2 (2020)

Part 1: Research Overview



5/1/2020

- Winter rye and clover plot mowed and disked



5/15/2020

- Beds shaped
- Sections with treatment #1 and #2 seeded



6/15/2020

- Sections with treatments 3, 4, and 5 seeded after stale seed bedding



7/15/2020

- Treatment #1 sections flail mowed & disked

Key Dates: Year 2 (2020)

Part 1: Research Overview



7/29/2020 - CRIMPED

- Treatment #1 disced and bed shaped
- All other sections terminated with roller-crimper



8/4/2020 - TRANSPLANT

- Same variety of broccoli transplanted in all sections by hand. Spacing 2 rows, 12 inches. 2 lines of drip tape laid per bed



9/15/2020 - HARVEST

- Harvest of broccoli begins and yields tracked

A photograph of a field with rows of green plants, possibly corn or sorghum, under a clear blue sky. A dirt path or furrow runs through the foreground. A white banner with black text is overlaid on the middle of the image.

Part 2: Treatment Selection

Summer Cover Crop Mixes

Part 2: Treatment Selection & Performance



1. Tilled after Sunn hemp (100#/acre)

- Nitrogen fixer
- High biomass



2. Crimped Sunn hemp

- Nitrogen fixer
- High biomass
- Good coverage and weed suppression at high seeding rate



3. Crimped Sunn hemp (100#/acre) + Millet (50#/acre)

- Performed best, but millet seeds were viable and reseeded

Summer Cover Crop Mixes

Part 2: Treatment Selection & Performance



4. Crimped Sunn Hemp (75#/acre), Millet (50#/acre) & Buckwheat (50#/acre)

- Buckwheat provides cover crop understory, but reseeded heavily.
- Millet reseeded as well

5. Crimped Sunn Hemp (75#/acre), Soybeans (50#/acre) & Buckwheat (50#/acre)

- Buckwheat provided cover crop understory but reseeded heavily.
- Soybeans terminated too early

A group of six people are gathered in a field of young green plants. In the foreground, a person wearing a large, wide-brimmed woven hat and a light-colored t-shirt is holding a small plant stem in their hand. Behind them, a woman in a blue and white striped shirt looks on. Further back, a man in a red t-shirt and a straw hat has his hand to his chin in a thoughtful pose. Next to him, a woman in a white t-shirt and brown pants is looking down. In the center, a woman in a white t-shirt and khaki shorts stands with her hands at her sides. To the right, a man in a grey hoodie and khaki pants is examining a small plant specimen in his hands. In the background, a black utility vehicle is parked on the grass, and a dense line of trees is visible under a blue sky with scattered clouds.

Part 3: Data & Reflections

Weed Suppression

Part 3: Data & Reflections

- Sunhemp/soybean regrowth and buckwheat/millet reseeding created most competition
- Perennial weeds like horse nettle and peppervine not killed by previous years cover cropping and tillage
- Most annual weeds suppressed which may be from cover crop coverage (and regrowth)



Weed Suppression Tracking

Part 3: Data & Reflections

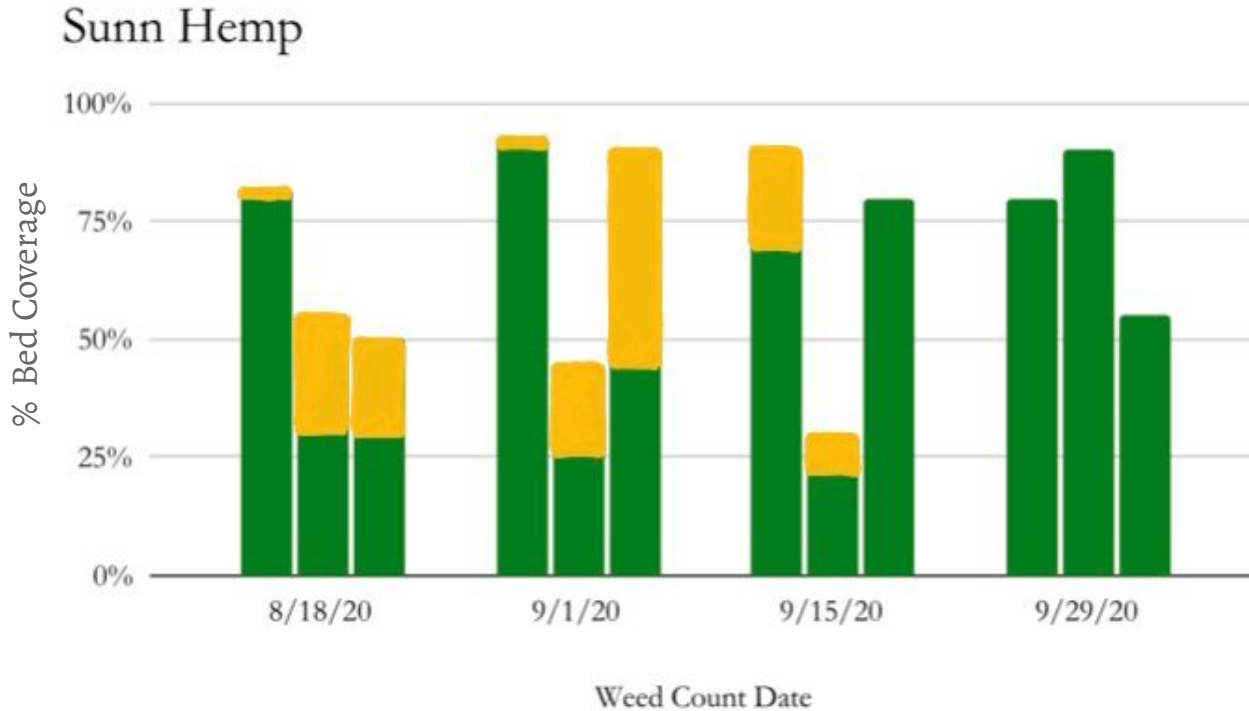
A primary goal of crimped cover cropping systems is to suppress annual weeds.

We assessed the effectiveness of our cover cropping through weed tracking. We tracked perennial & annual weed coverage in a randomized 5x5 plots in each of the treatments on a bi-weekly basis.

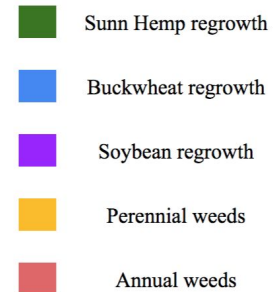
We experienced significant cover crop regrowth & reseeding. The following graphs depict the % cover of weeds and cover crop regrowth/reseeding. Negative space in the graphs is shows properly mulched bed space and broccoli plant coverage.

Weed Suppression & Cover Crop Regrowth

Part 3: Data & Reflections



Sunn Hemp alone did not suppress perennial weed growth at first. Over time the cover crop regrowth ultimately outcompeted both perennial weeds and broccoli.

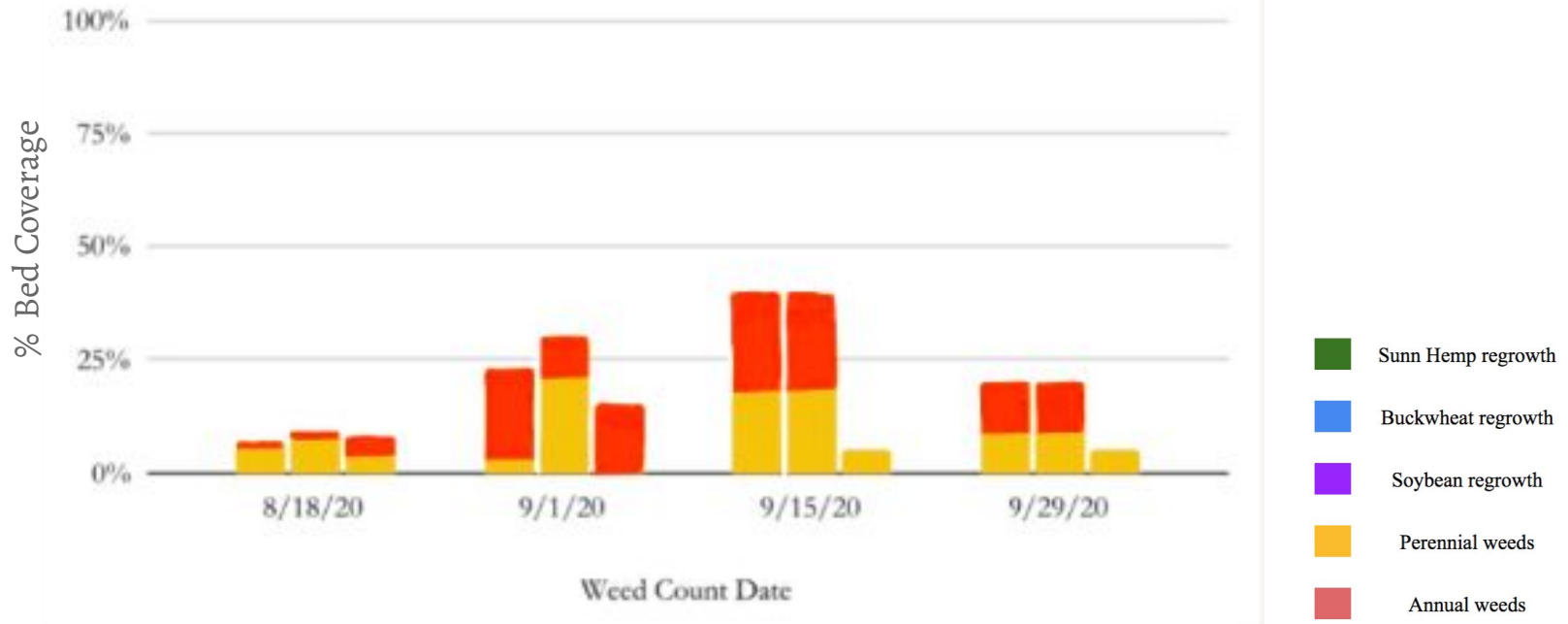


Weed Suppression & Cover Crop Regrowth

Part 3: Data & Reflections

We experienced low suppression of both perennial and annual weed growth.

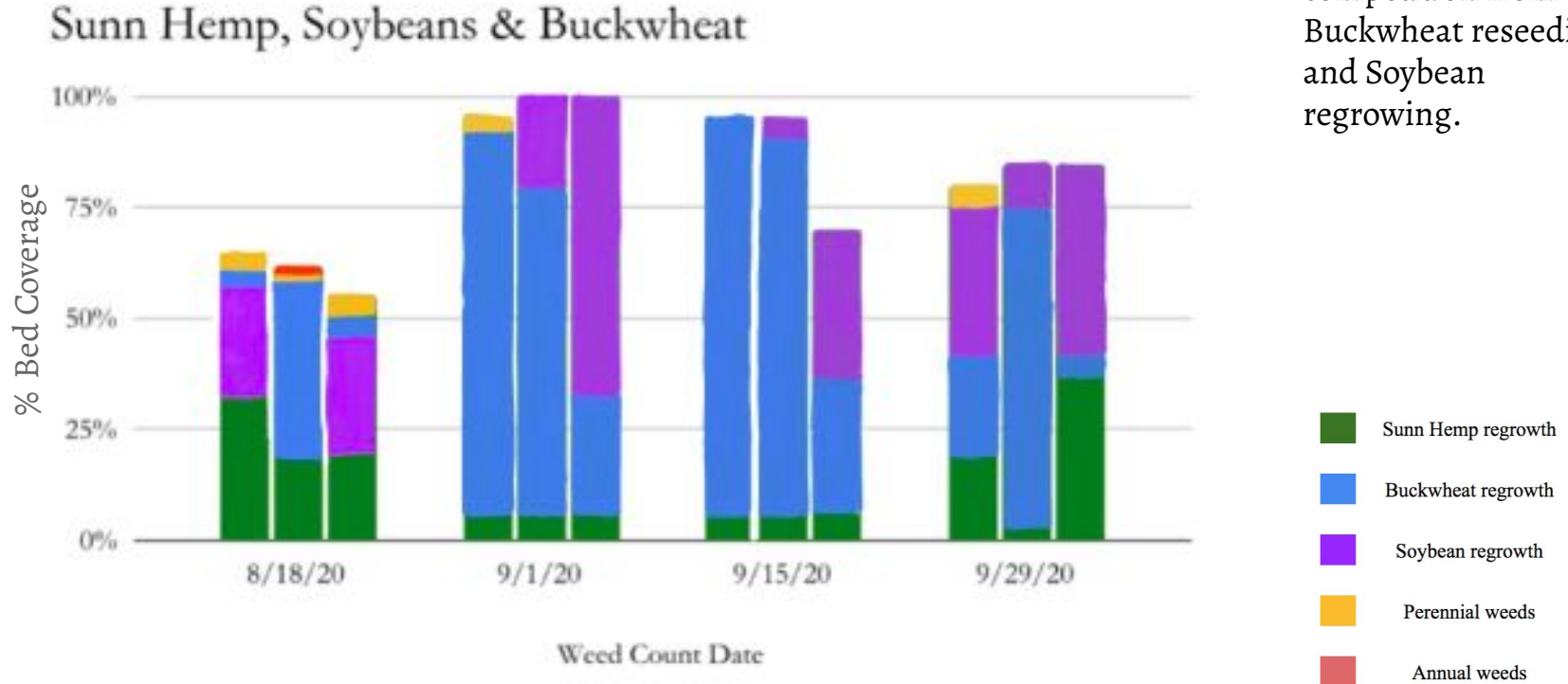
Tilled after Sunn Hemp



Weed Suppression & Cover Crop Regrowth

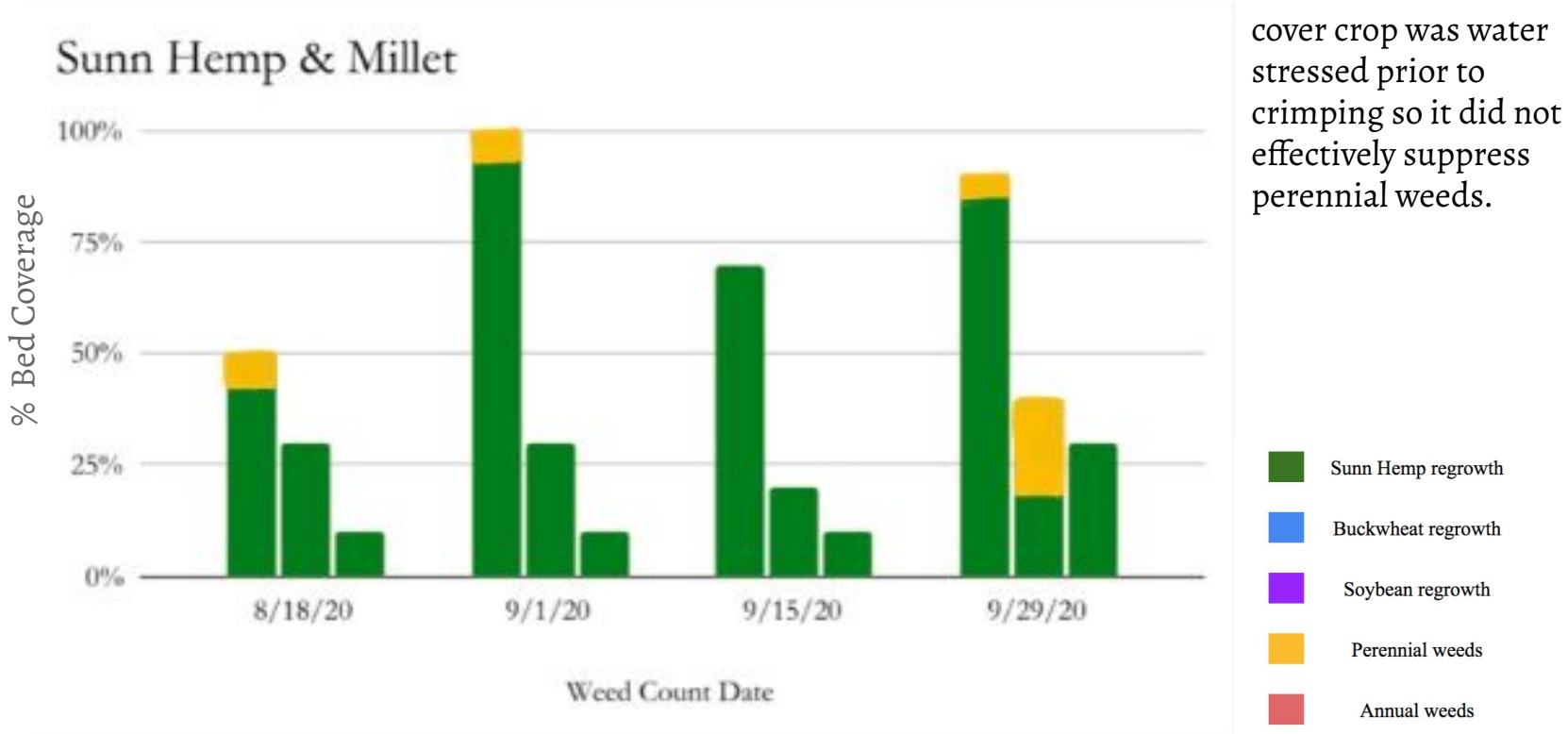
Part 3: Data & Reflections

In this plot we experienced competition from both Buckwheat reseeding and Soybean regrowing.



Weed Suppression & Cover Crop Regrowth

Part 3: Data & Reflections

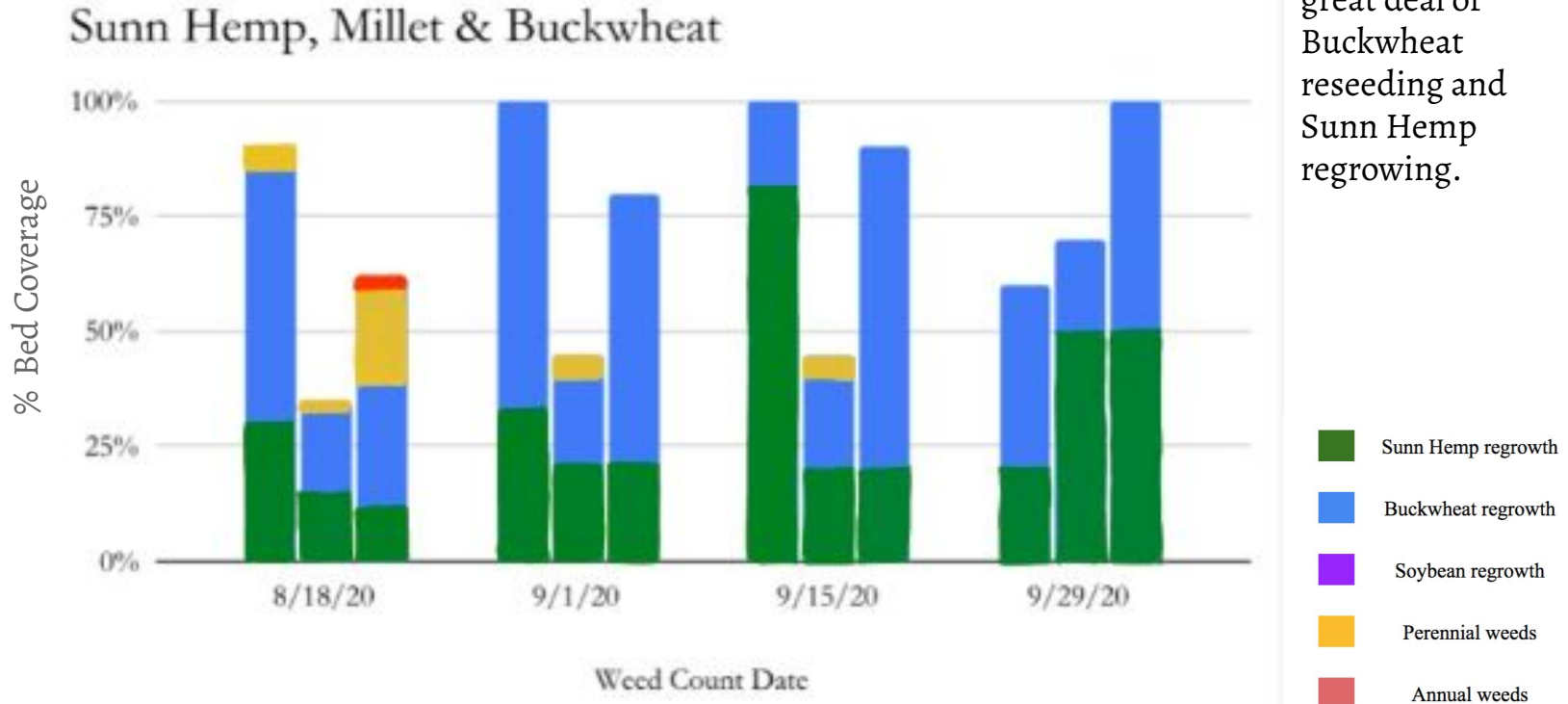


In this plot, we believe the Millet cover crop was water stressed prior to crimping so it did not effectively suppress perennial weeds.

Weed Suppression & Cover Crop Regrowth

Part 3: Data & Reflections

In this plot we experienced a great deal of Buckwheat reseeding and Sunn Hemp regrowing.



Sunn Hemp Treatment

Part 3: Data & Reflections

8/15/20



9/15/20



9/29/20



Tilled after Sunn Hemp Treatment

Part 3: Data & Reflections

9/15/20



9/29/20



Sunn Hemp, Soybeans and Buckwheat Treatment

Part 3: Data & Reflections

8/15/20



9/15/20



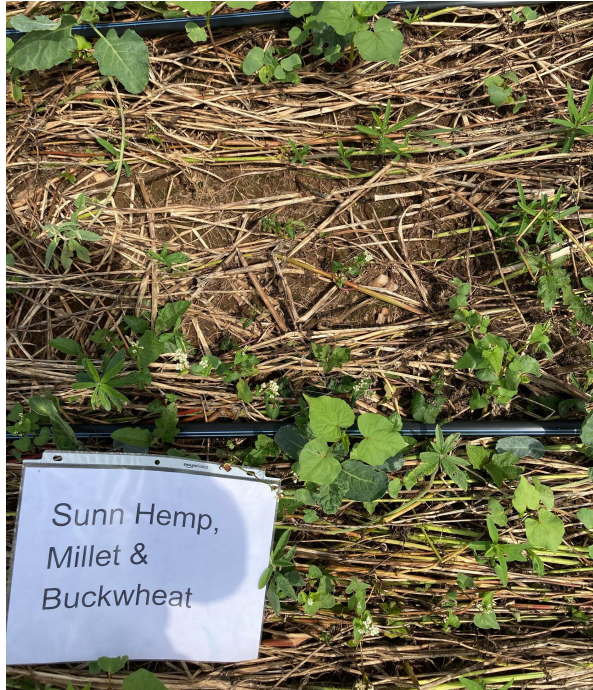
9/29/20



Sunn Hemp, Millet and Buckwheat Treatment

Part 3: Data & Reflections

8/15/20



9/15/20



9/29/20



Sunn Hemp and Millet Treatment

Part 3: Data & Reflections

8/15/20



9/15/20



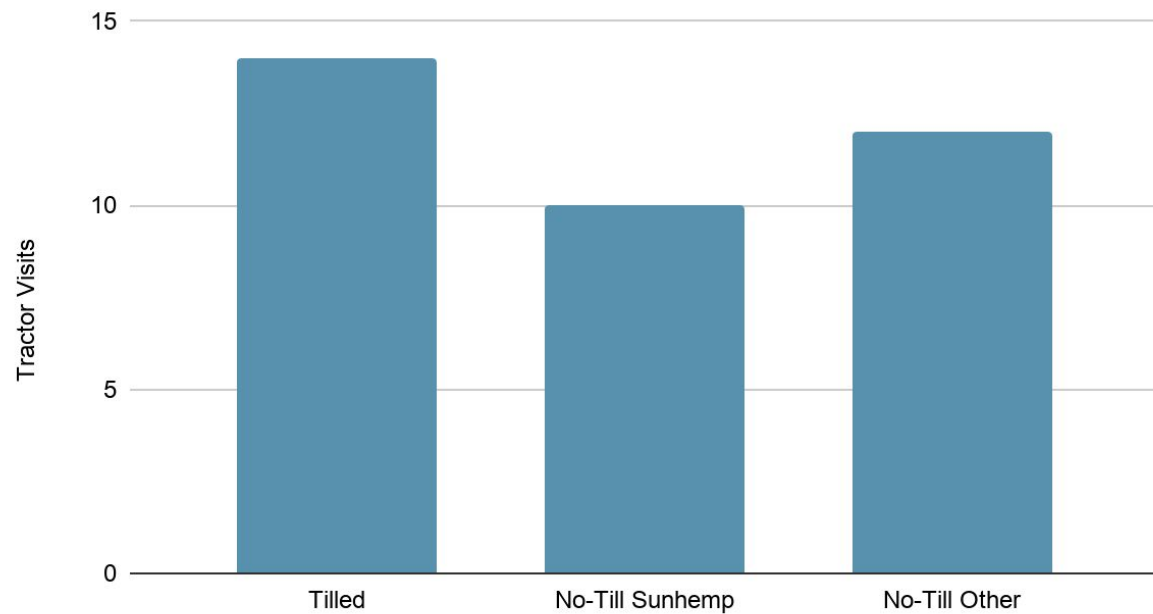
9/29/20



Labor Hours

Part 3: Data & Reflections

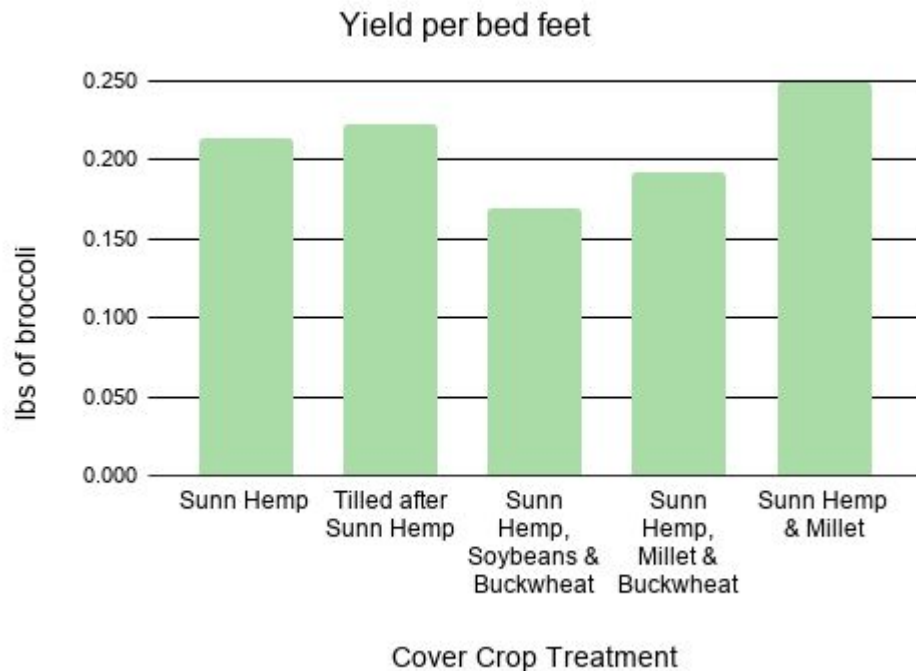
Tractor Visits Per Treatment Type



Yields

Part 3: Data & Reflections

- Yields were highest in the sunn hemp + millet plots
- We experienced broccoli stem elongation due to light competition
- Mowing sunn hemp regrowth knocked some broccoli over
- Significant crop loss to disease
- Significant crop loss due to poor transplant production



Disease

Part 3: Data & Reflections



The following diseases were noticed in the field:

- Alternaria head rot
- Bacterial head rot

Reflections

Part 3: Data & Reflections



- Poor fall transplant production probably due to pythium, weak transplants affected growth in field
- Timing is everything for the crimping since we experienced both cover crop regrowth and reseeding
- Cover crop regrowth reduced air circulation and may have increased disease problems
- We had to mow sunn hemp regrowth twice to get more light to broccoli. It was also difficult to access the broccoli plants with the tractor sprayer due to sunn hemp height



Part 4: Strategies for Year 2

Adjustments

Part 4: Strategies for Year 2

- Crimping x2 may prevent sunn hemp regrowth. Year 2 experiment will give comparison.
- Adjusting weight of roller to prevent cutting of sunn hemp
- Sunn hemp crimping experiments comparing soil moisture at crimping, sunn hemp age and times crimped needed.
- Add sunn hemp soybean mix?
- Timing with japanese millet crimping?
- Eliminate buckwheat?



A photograph of two men in a field of lush green plants. The man on the left is standing, wearing a dark green t-shirt with a Champion logo and sunglasses hanging from his neck. The man on the right is sitting, wearing a light blue button-down shirt and shorts. A white text box is overlaid in the center of the image.

Part 5: Conclusion

Study Summary

Part 5: Conclusion



- We found that the yield/bed ft of the treated plots were as follows (highest to lowest yield) :
 1. Sunn Hemp + Millet
 2. Tilled
 3. Sunn Hemp
 4. All Buckwheat mixes
- The buckwheat & millet treatments reseeded heavily because the seed was allowed to mature past the viable date.
- The sunn hemp and soybeans regrew after crimping.
- Annual weeds were more successfully suppressed by the mixed cover crop mulch compared to the straight sunn hemp.



Interested in a job?
Work with us!

A man in a green and white plaid shirt is looking at a large aerial map. The map shows a rural landscape with fields, trees, and buildings. A white text box is overlaid on the map, containing the text "Interested in getting help on your land? Consult with us!".

Interested in getting help on your land?
Consult with us!

A photograph of a field of green plants, possibly a crop field, with a central path or aisle. The plants are dense and vibrant green. A white rectangular box is overlaid in the center of the image, containing the text "Questions?".

Questions?