Combining Cover Crops, Strip Tillage, and Novel Mulches to Manage Weeds in Carrot

Background

- Heart and Soil Farms
  - Small seeded crops

- Local Food
  - Low barrier of entry for young entrepreneurs

RED RIVER MARKET

Purpose

- Audience: small-scale vegetable producers
- Problem: weed management for small seeded crops
  - Limited herbicides
  - Consumer preference
- Solution: integrate cover cropping with production
  - Solves production year loss

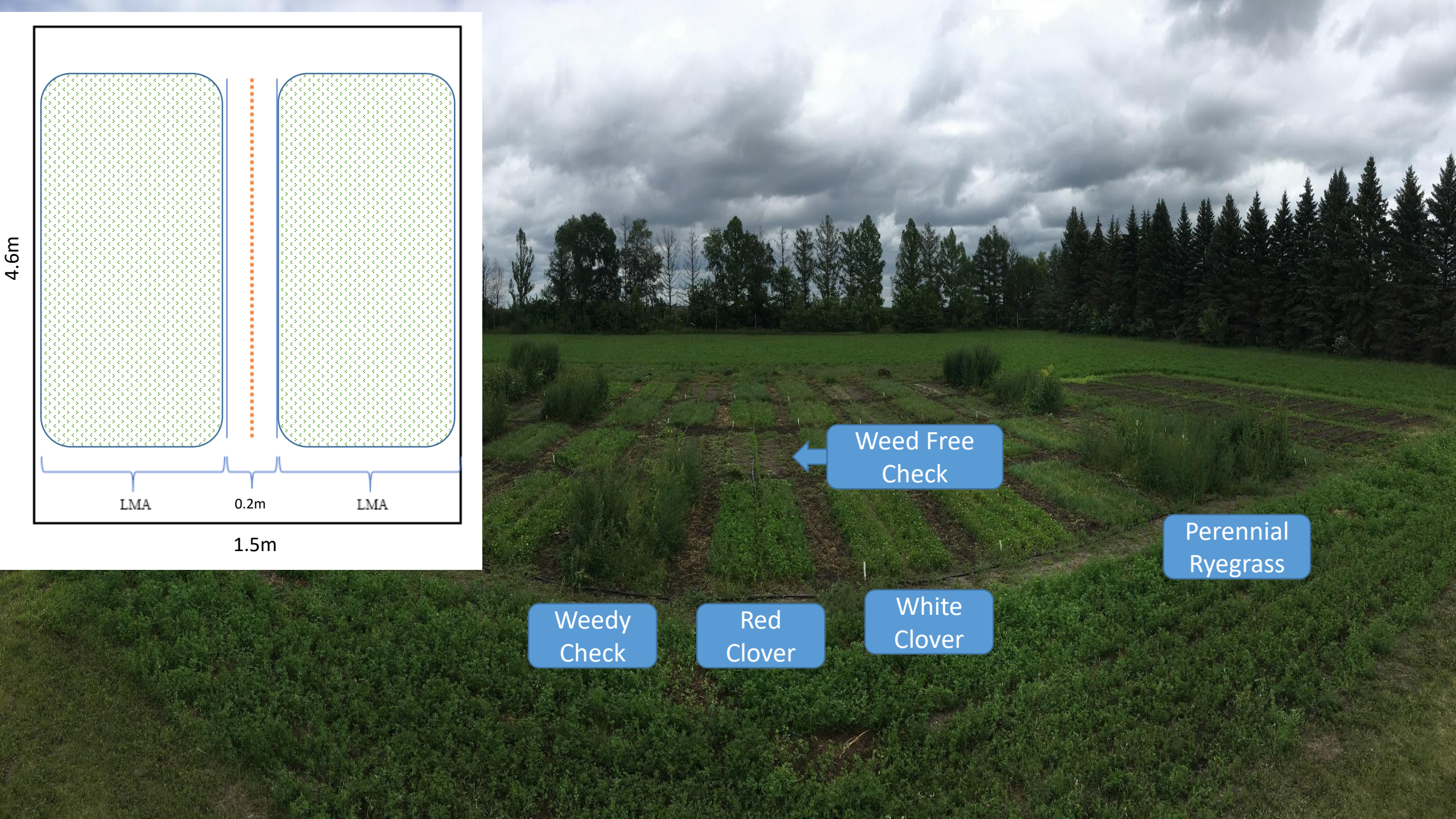
Objectives

Evaluate living mulch and surface mulch effect on

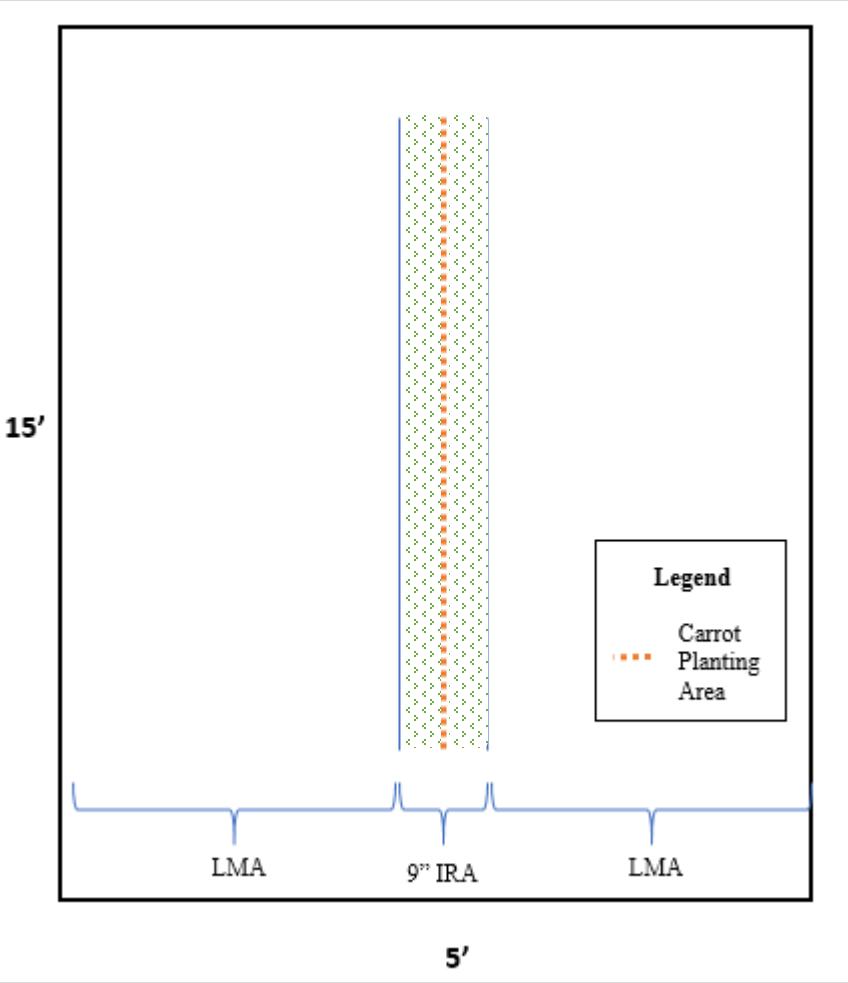
1. Carrot emergence
2. Carrot yield
3. Weed suppression

Methods

- Two sites
  - Absaraka, Fargo
- Two years
  - 2018, 2019
- Five living mulch treatments
  - Red clover, white clover, perennial ryegrass, weedy check, weed-free check
- Three surface mulch treatments
  - Hydromulch, compost blanket, control
- Napoli carrot seed, pelleted, planted with JP-Jang seeder
  - Irrigated with drip tape

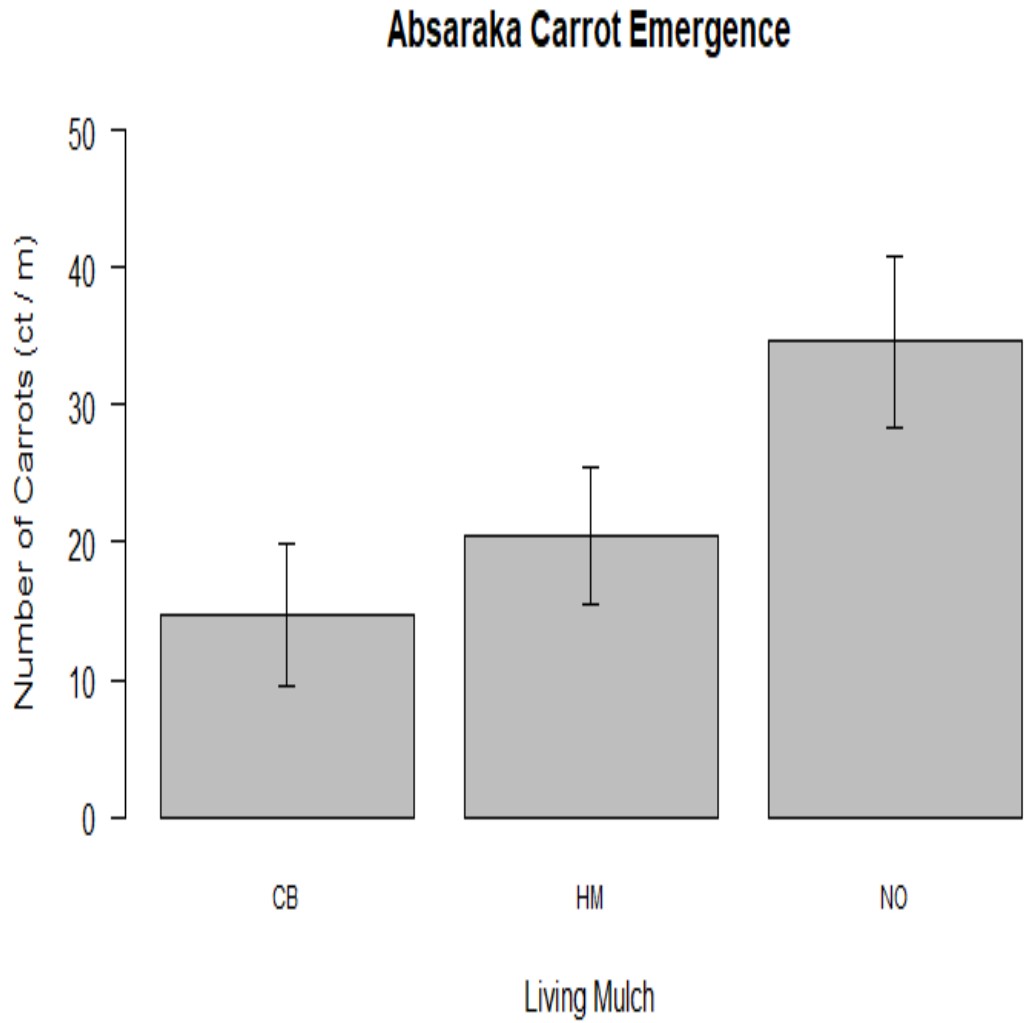

4.6m
LMA
0.2m
LMA
1.5m
Weed Free Check
Perennial Ryegrass
Weedy Check
Red Clover
White Clover

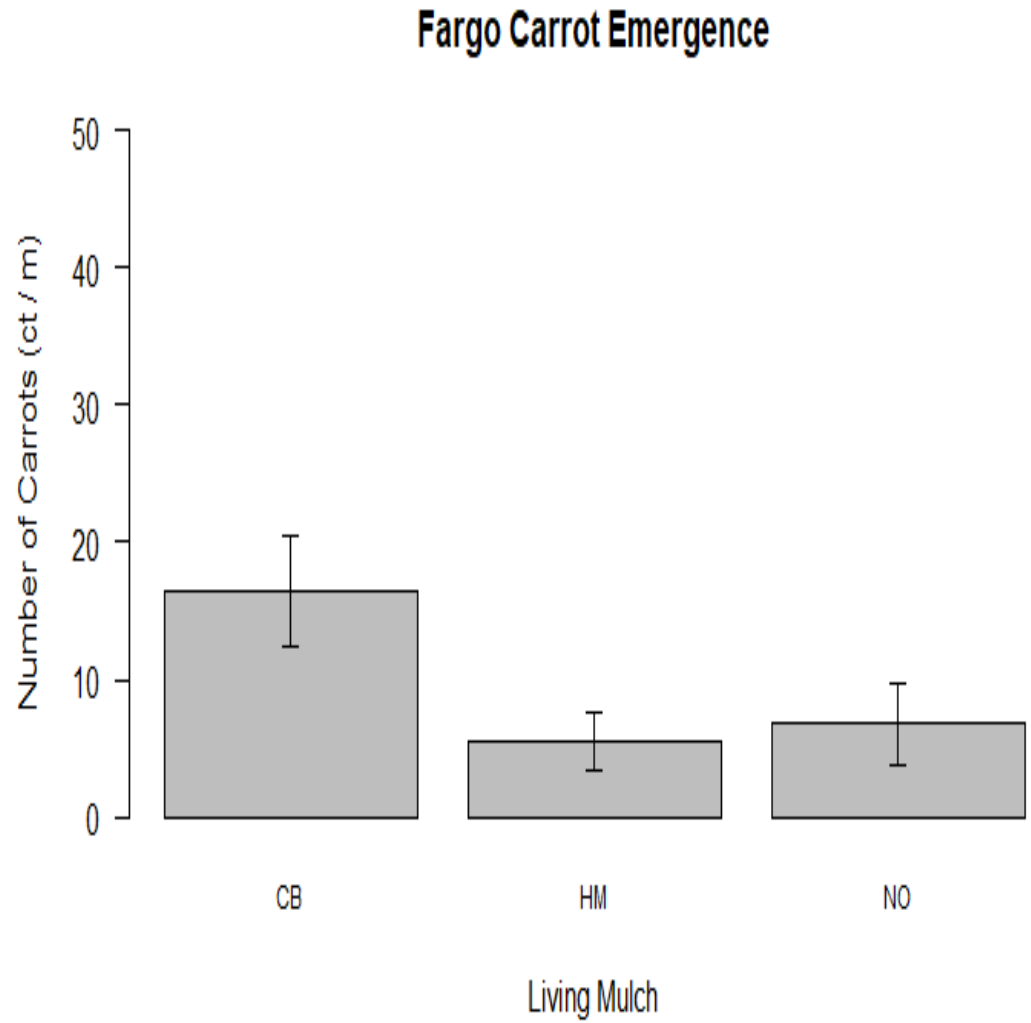
In-Row Area Treatments



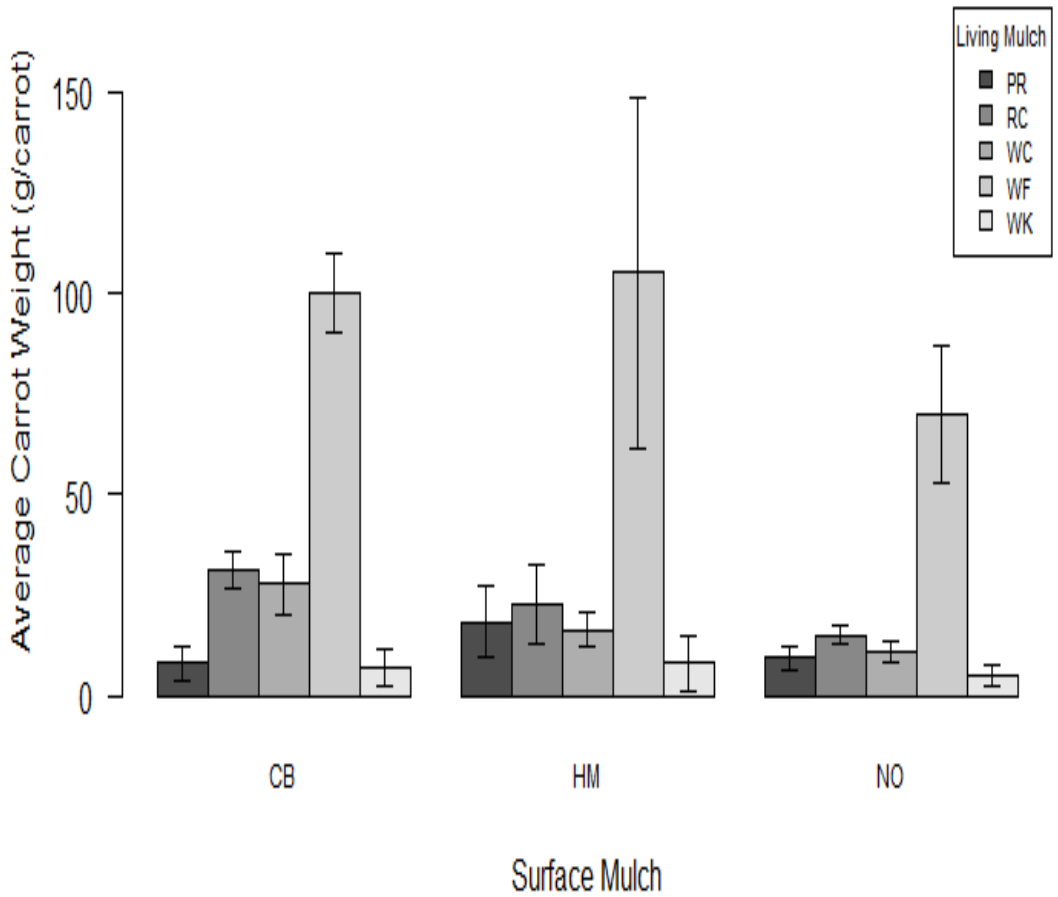
Hydromulch

Compost Blanket

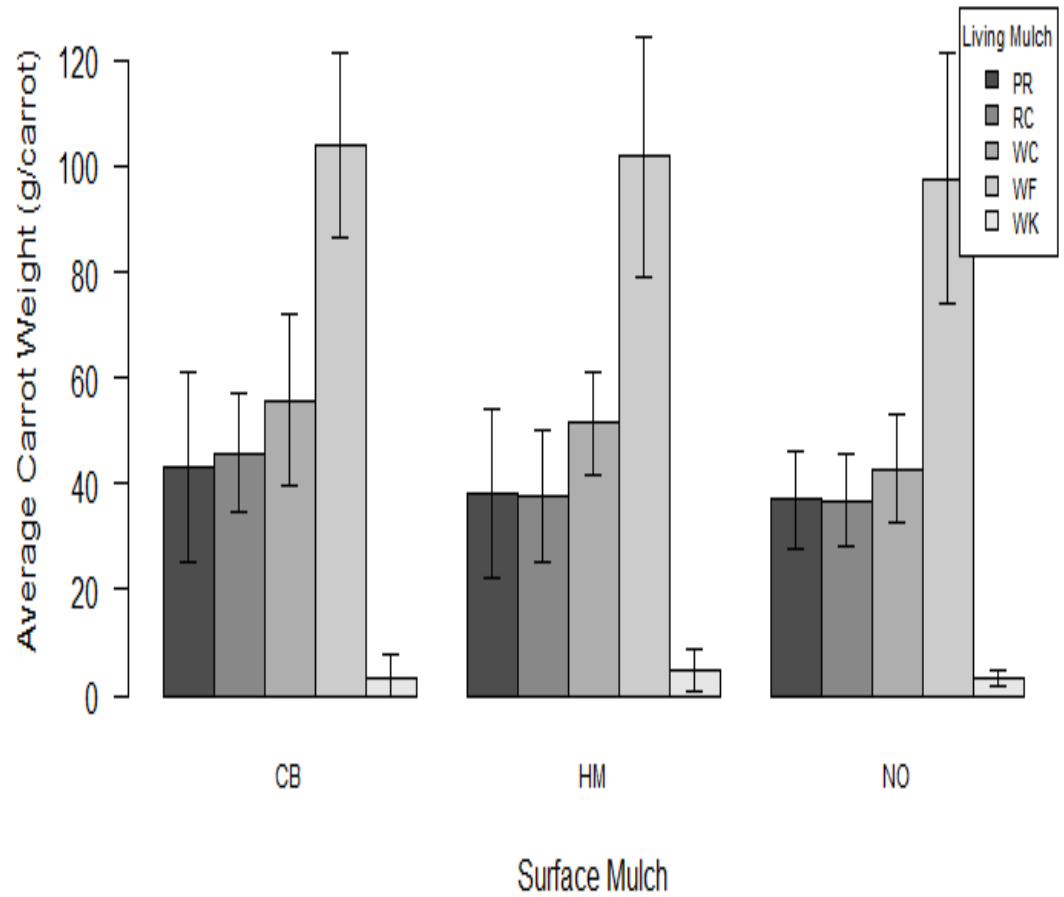

Absaraka Carrot Emergence
Number of Carrots (ct / m)
0
10
20
30
40
50
CB
HM
NO
Living Mulch


Fargo Carrot Emergence
Number of Carrots (ct / m)
0
10
20
30
40
50
CB
HM
NO
Living Mulch

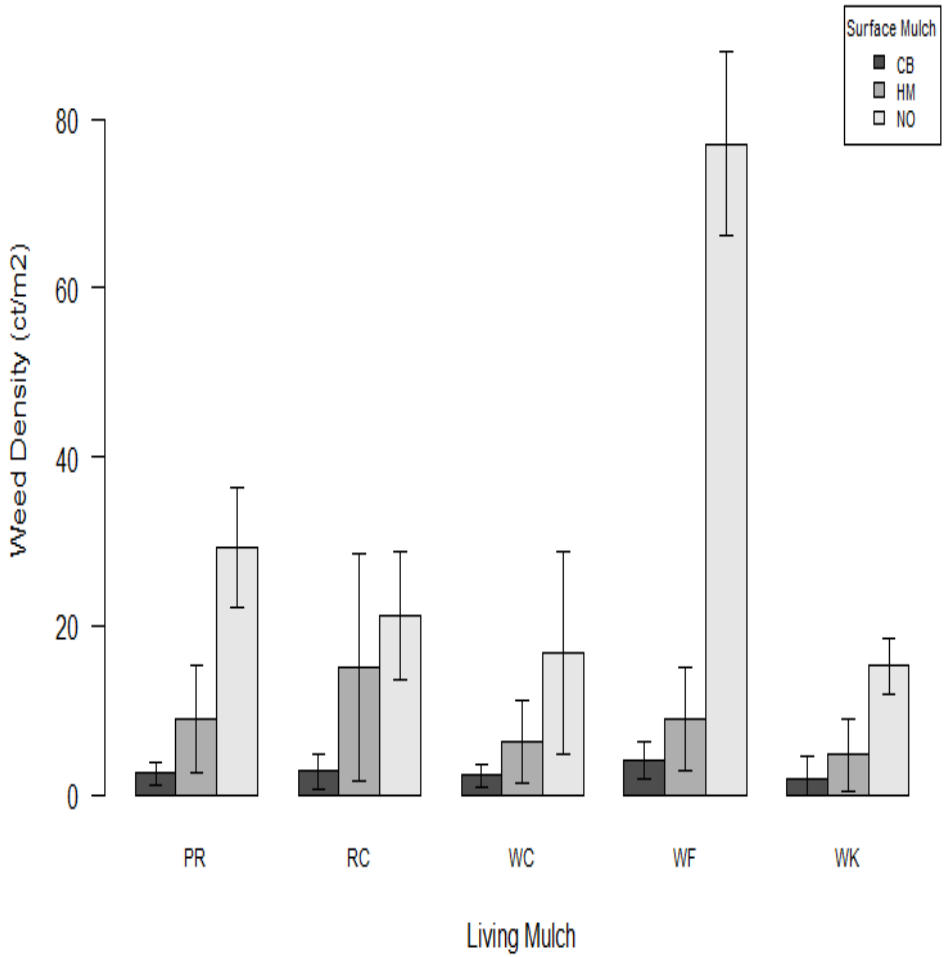
Absaraka Carrot Yield



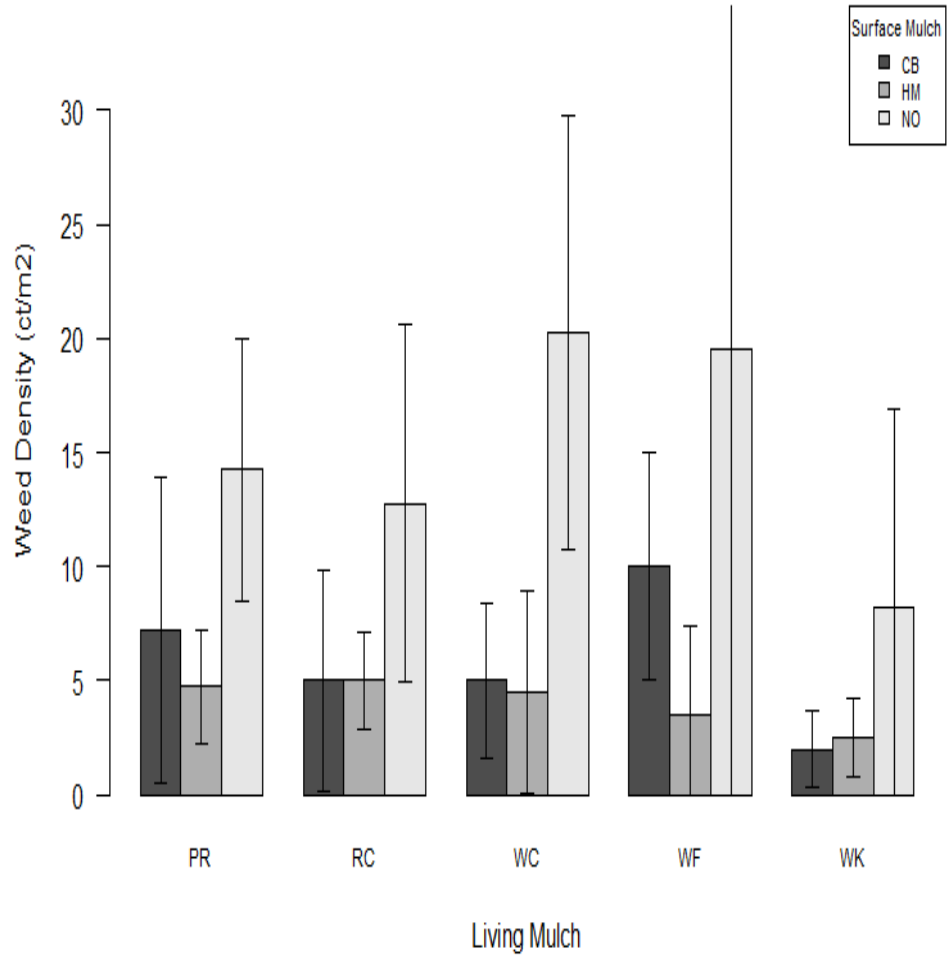
Fargo Carrot Yield



Absaraka In-row Weed Population Density



Fargo In-row Weed Population Density



Summary of Results

- Emergence
  - Compost blanket significantly greater emergence than other treatments in Fargo.
- Yield
  - Living mulch dependent. Weed-free yielded highest, perennial ryegrass least.
- Weeds
  - Mulches significantly greater suppression.

Discussion

- Emergence
  - Soil Texture
- Yield
  - Living mulches
    - management
- Weeds
  - Hydromulch and Compost Blanket work

- Proof of concept

Special Thanks

- USDA-Hatch Project # ND01583
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Further Development

- Application technique
- Different levels of treatments
  - 1x depth
- Different mixtures

Questions?