



# Effectiveness of row covers against late frost in unheated high tunnels

*Agricultural Sciences*

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# High Tunnels

- High Tunnel = passive solar hoop house
- Uses Plastic to trap IR heat
- Low Energy Input
- Out-of-season growing
- Susceptible to low nightly temperatures



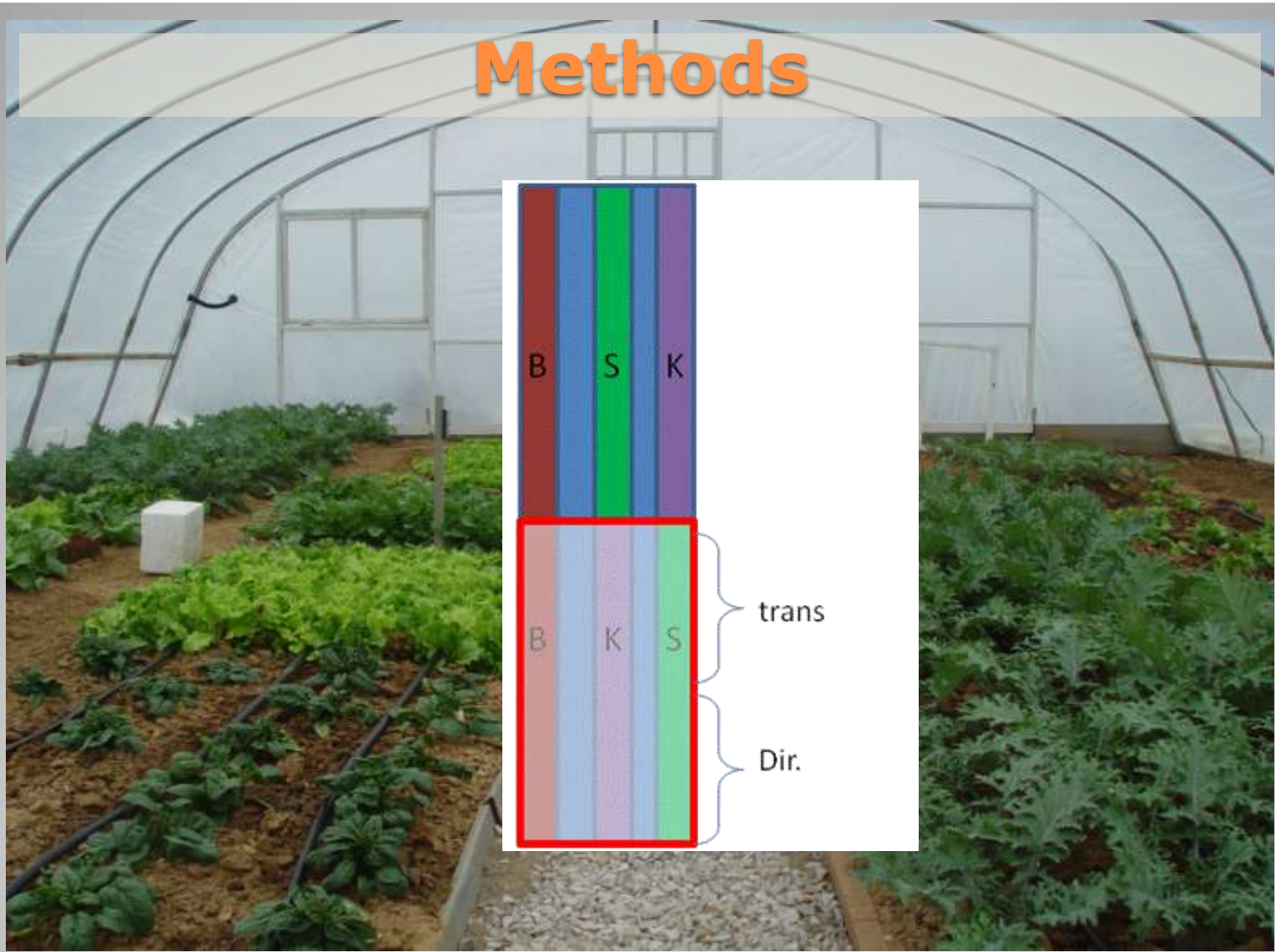
## Row Covers

- Polyester Cover
- Insulates heat
- Testing to see if row covers will effectively retain heat for soil in high tunnels
- Row covers could potentially increase the effectiveness of high tunnels for extending out of season growing

## Methods

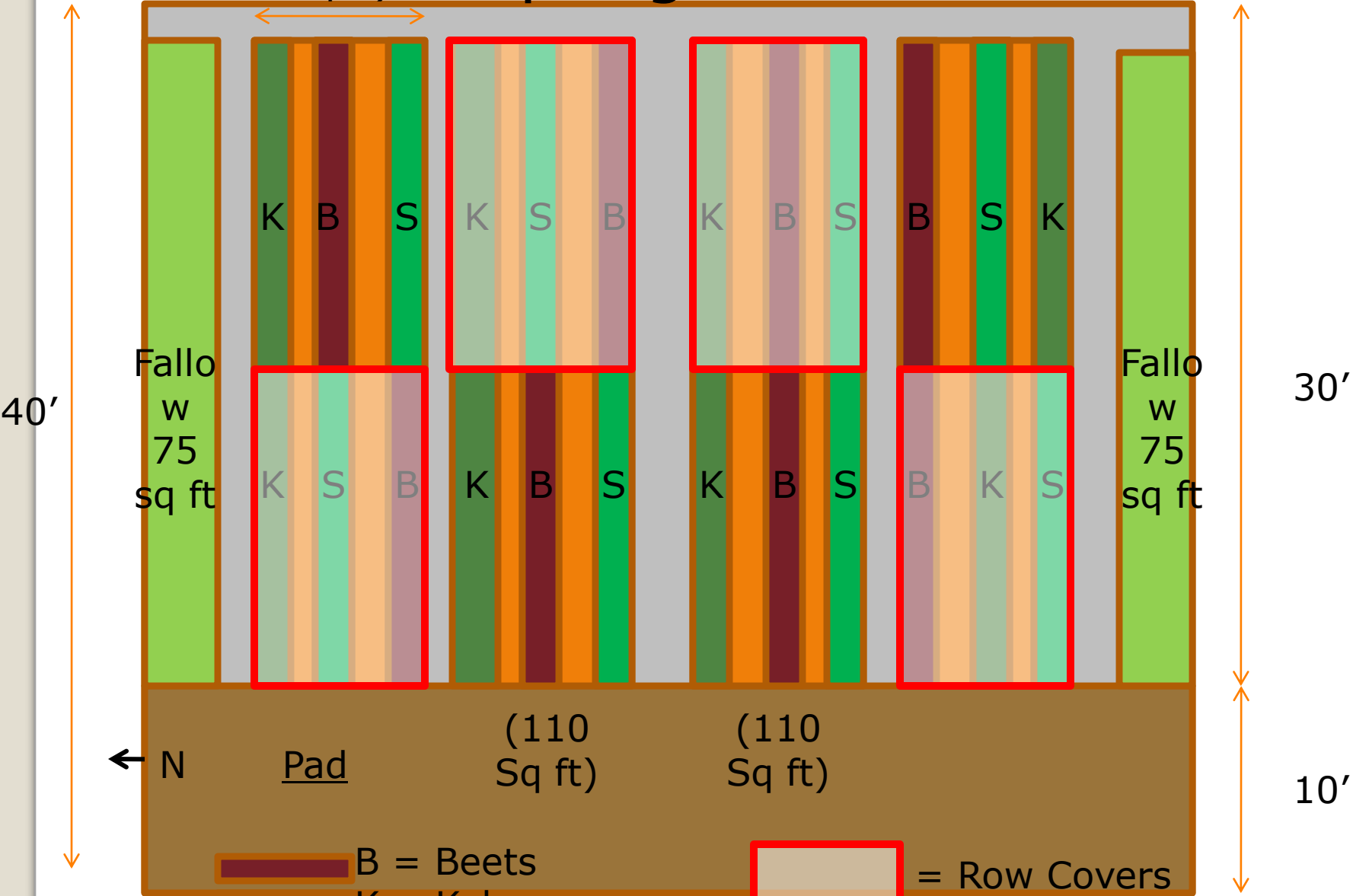
- Divided rows into uncovered and covered sections
- Planted three crops in each row.
  - Kale (*Brassica napus pabularia*), Beets (*Beta vulgaris*) and Spinach (*Spinacia oleracea*)
- Four replicated rows
- Subdivided each treatment into transplanted and direct seeded beds

# Methods




# Spring 2010

(110 Sq ft)



- B = Beets
- K = Kale
- S = Spinach

 = Row Covers (55 ft<sup>2</sup>)



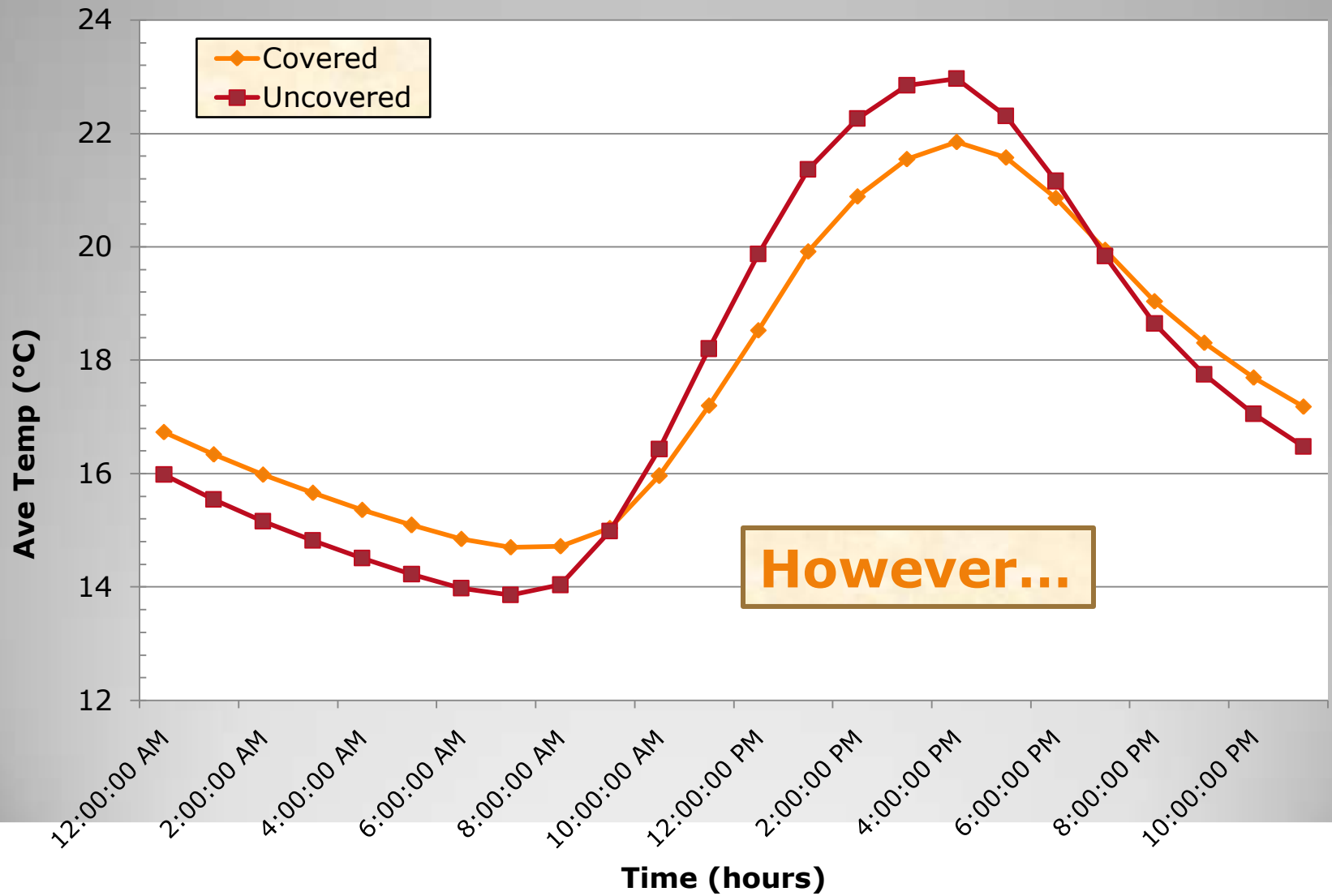
# Temperature

- Used a datalogger to record temperatures samples every hour
- Our sampling period lasted March 2-May 18 (77 Days)
- Recorded temperatures
  - Average, Maximum and Minimum

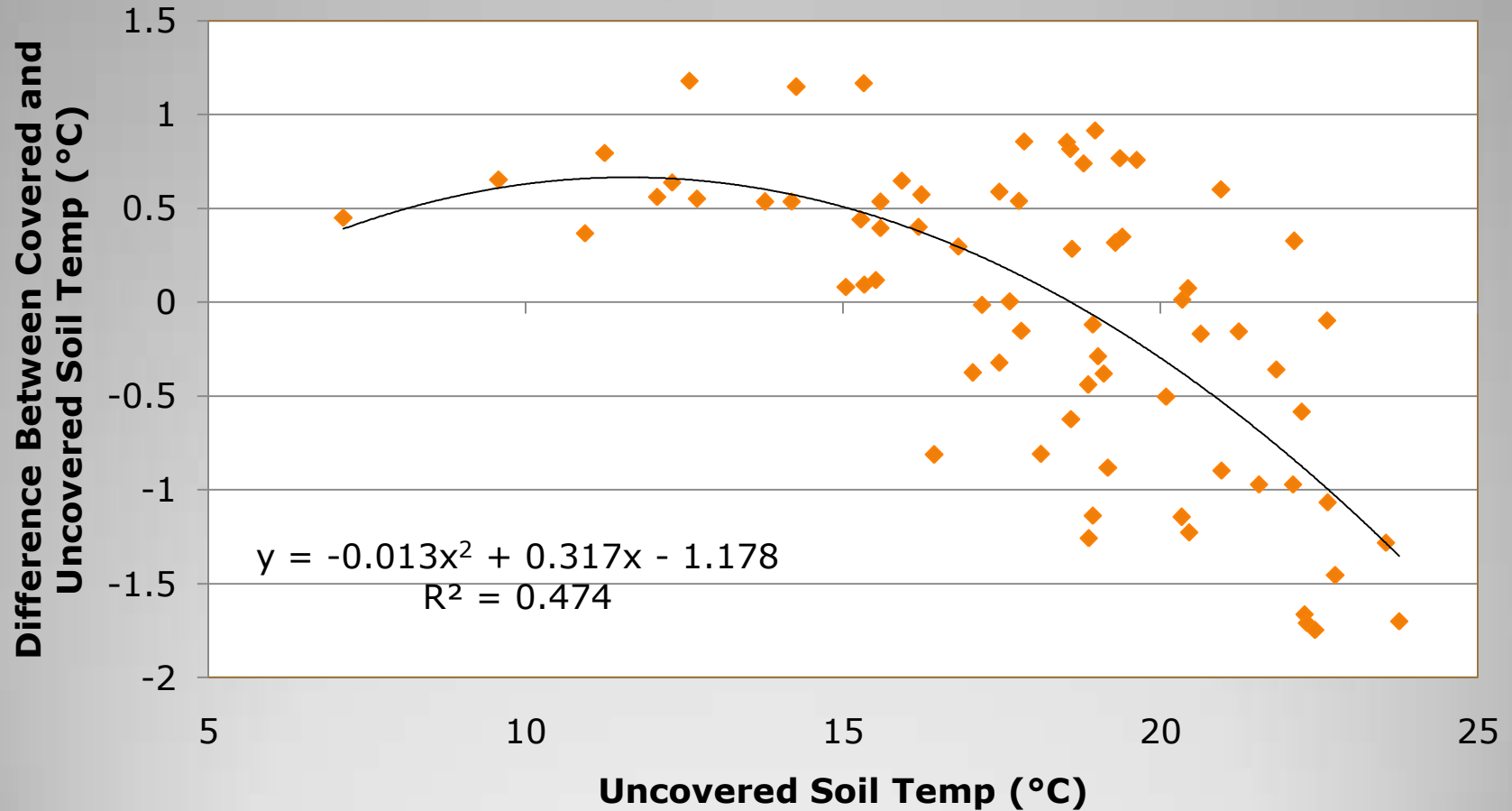
# Yield

- Recorded aboveground dry weight of 3' subsample from each treatment combination

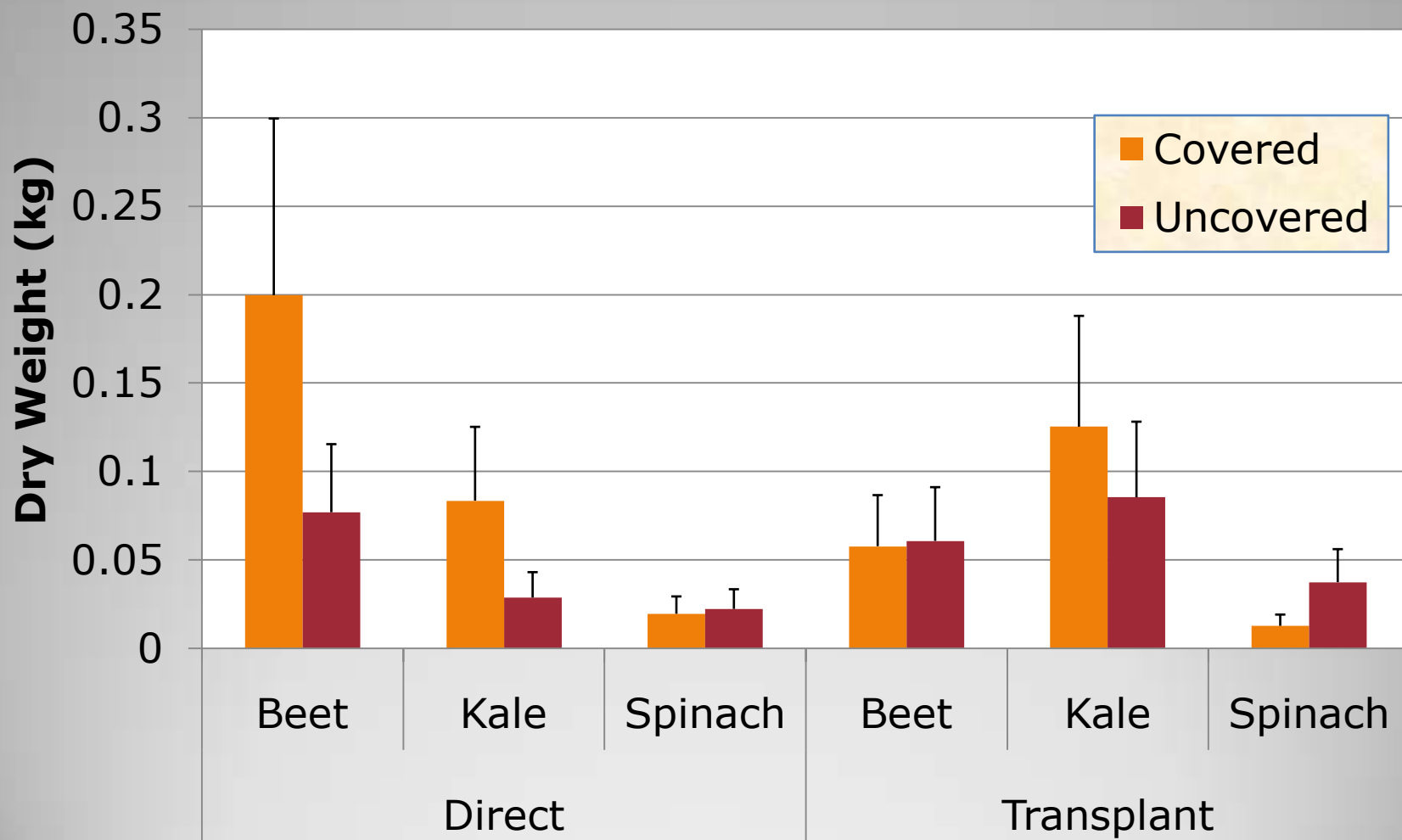
# Row Covers Moderate Temperature



# Row Cover Effects at a Range of Soil Temperatures



# Yield



A photograph of a person wearing a green jacket and a white hat, working in a high tunnel. The person is bent over, possibly tending to plants or soil. The high tunnel is covered with a white plastic material supported by a metal frame. The ground is covered with brown straw or mulch. The background shows a bright, overcast sky.

# Conclusions

- Row covers moderated temperature but did not affect average soil temperature overall
  - Warmed soil at cool temps
  - Cooled soil at warm temps
- Row covers had no significant effect on crop yields. Not recommended for use in high tunnels.
- Considerable variability within treatments
  - Soil conditions varied within the high tunnel

# Future work



- Repeating study this fall
  - Investigate the effect of covers on photosynthetically active radiation
  - Further investigate moderating effects of row covers