



COVERCROP

VEGETABLE PRODUCTION TRAINING

Session 7

Cover crops in vegetable systems, Part II

UofA DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

Outline

- Examples of how cover crops can impact vegetable crop production: *yields, weed control and pests.*
 - Research from Arkansas
 - Research from the Southeastern U.S.



Effects of Summer Cover Crops on Yield

Summer Cover Crops for Fall Broccoli Production

- Fall plasticulture 'Arcadia' Broccoli head size and yields were increased in plots planted in a summer cover crop of cowpea 'Iron Clay' over control plots at two site locations during the fall of 2016.

(McWhirt and Lee, 2017)



Cover Crops Effect on Reducing Soil Nitrogen Leaching in Winter

- **Problem:** want to retain soil nitrate and prevent it from leaching during winter, but too much cover crop biomass that needs to be incorporated may delay planting
- **Solution:** Kill cover crops with herbicide at an early growth stage (8-9 weeks post germination) to reduce biomass
- **Outcome:** the early killed cover crop can sometimes retain nitrate better than bare ground plots, but not always equal to an un-killed cover crop
 - (Heinrich, Smith and Cahn, 2014)



Strip-Till Plasticulture

Watermelons

Currently used practices in NE Arkansas:

- Winter cover crops planted to precede spring planted melons
 - Wind-break
 - Weed control in the alleyways



Seedless watermelon, No-till:

- *Crimson clover + rye or Hairy vetch*
 - Higher fruit number and yields compared to bare ground (where there was 100 lbs. N supplied)

Rangappa, Hamama and Bhardwaj. 2002.



Examples of Cover Crops Delaying Harvest and Reducing Yield

Eggplant

- Lower soil temperatures in a no-till eggplant system resulted in delayed harvests and reduced the yields when compared to a bare ground plot or a black plastic mulch plot.

(Chen et. al 2017)



Cover Crops Impacts on Soil Health

- After 2 years of using reduced-till and cover cropping in *organic* vegetable production, increases in soil organic matter and soil nitrogen were observed relative to tilled systems were that was also using cover crops.
- The reduced till system had higher weed pressure.

(Butler, Bates and Inwood, 2016)



No-Till Cover Crops Conserve Soil Moisture

No-till tomato

In drought years rye cover crop mulch had higher marketable tomato yields compared to plastic mulch.

- Likely due to better soil moisture conservation. (Kornecki, and Arriaga. 2011)

Rye cover crop residues plus glyphosate suppressed annual grasses, jimsonweed and common lambsquarters but did not suppress smooth pigweed and ivyleaf morning glory in a single year trial in New Jersey.

(Jack Rabin, 2013)



Take Home Message

- Cover crops can have diverse impacts on vegetable cropping systems
 - Well thought out cover crop selection, crop management and timing can increase the chances of success and the benefits to the cash crop and soil health.



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Resources and Sources

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