

Building Better Soil through Cover Cropping and Good Agricultural Practices

*Touria Eaton, Ph.D.
Assistant Professor of Horticulture
State Horticulture Extension Specialist
Lincoln University of Missouri
eatont@lincolnu.edu*



Questions:

- 1. Till or no till**
- 2. Do I really need to use cover crops**
- 3. What kind of cover crops can I use**
- 4. Do I need to fertilize it?**
- 5. When do I plant it ?**
- 6. How shall I terminate it?**

Questions:

- 1. Till or no till**
- 2. Do I really need to use cover crops**
- 3. What kind of cover crops can I use**
- 4. Do I need to fertilize it?**
- 5. When do I plant it ?**
- 6. How shall I terminate it?**

NO deep tillage!



At Carver Farm:

- we practice reduced tillage,
- rototilling to a depth of between 3" to 5"



Questions:

1. Till or no till

2. Do I really need to use cover crops?

Yes



Right management:

- **Cover crops can save money on fertilizer and weed costs**
 - **Legume covers can provide plant-available nitrogen to subsequent crops**
 - **High seeding rates can sometimes pay off in terms of improved weed control**
- **Fibrous cover crop roots hold soil aggregates together (aeration, water infiltration)**
- **Deep tap roots can potentially loosen hard pans**

Questions:

1. Till or no till

2. Do I really need to use cover crops?

Yes



Right management:

- **Roots and their exudates also support the growth of microorganisms**
 - **Many of these organisms release glomalin and other compounds that hold sand, silt and clay particles together in strong soil aggregates.**
 - **High biomass cover crops can also maintain or increase soil organic matter, which increases soil water holding capacity and nutrient holding capacity, and can help reduce the risk of some soil-borne diseases.**
- **Worth the effort**

Questions:

1. Till or no till

2. Do I really need to use cover crops?

Yes

Trade offs:

- ground is not in a cash crop during the period of time that the cover crop is growing and for up to four weeks after the cover crop is incorporated while the residue is decomposing
- direct costs of seed, ground preparation, potentially irrigation, and incorporation
- some cover crops can increase the risk of pest damage, for example, brassica cover crops could increase the risk of clubroot in the soil.

The benefits of cover cropping have to be balanced against potential drawbacks related to your crop rotation



Questions:

1. Till or no till

2. Do I really need to use cover crops?

Yes



Can compost and organic fertilizers replace cover crops?

- May be yes in regards to regard to crop nutrient demand

But

- cover crops are less expensive than most other purchased soil amendments
- Provide more benefits than compost and organic fertilizers
 - Aggregate formation, aeration, water infiltration,
 - reduces salt build up in the soil and prevent nutrients loss and leaching to ground water.

Investment ...

Questions:

1. Till or no till
2. Do I really need to use cover crops?
3. What kind of cover crops can I use?

See Handout ...

- short duration cover crops (40 to 50 days from seeding to terminating):
 - Cowpeas: legume
 - yellow mustard
 - oilseed radish
- Crop rotation include the cover crop. If you are growing brassica as a cash crop, do not grow a brassica as a cover crop.



Questions:

1. Till or no till
2. Do I really need to use cover crops?
3. What kind of cover crops can I use?

See Handout ...

Example of a rotation:

1. Solanacea (tomato),
2. cucurbit (cucumber),
3. lettuce,
4. brassica (cauliflower or radishes),
5. legume (peas or beans)
6. carrots.

The cover crop following the cash crop should not be from the same family as the cash crop for example do not follow cash crop (mustard greens) with the cover crop yellow mustard



Questions:

1. Till or no till
2. Do I really need to use cover crops?

3. What kind of cover crops can I use?

High-density cereal-legume mixes for weed suppression



- weed management as one of the top production challenges,
 - Poorly managed cover crops can increase weed problems.
 - Increased weeds can have a negative impact on a farm's profitability
 - Reductions in yield and/or high weeding costs.
- Fast-growing cover crops can effectively:
 - smother weed competition
 - reduce weed populations in subsequent cash crops
- If weeds are a concern,
 - it is important to make cover crop decisions that
 - can help reduce weed pressure over time

Questions:

1. Till or no till
2. Do I really need to use cover crops?

3. What kind of cover crops can I use?

High-density cereal-legume mixes for weed suppression

- Cereal-legume mixes: popular as cover crops due to the addition of nitrogen through nitrogen-fixing legumes
- However, the use of legumes may not always be the best for winter weed control due to low plant densities at typical seeding rates and slow emergence in cool temperatures
- high-densities (2-3x typical commercial seeding rates) can reduce weed populations compared to standard seeding rates.
- seed costs: Concern _ this may pay off in reduced subsequent weeding costs in a cash crop



Questions:

1. Till or no till
2. Do I really need to use cover crops?

3. What kind of cover crops can I use?

Furrow cover cropping in organic strawberries

- A furrow cover cropping system has been developed and tested by researchers for strawberries grown on plastic beds. (in open field)
- Ida Gold' mustard was planted in the strawberry furrows after harvest. This mustard was allowed to grow through the winter and is then easily mow-killed with a weed-whacker when the cover crop reached the height of the beds
- While this system doesn't offer all of the benefits of growing a cover crop on an entire field, it does provide some help especially if the beds for the following crops are planted where the cover crops were.



Questions:

1. Till or no till
2. Do I really need to use cover crops?
3. What kind of cover crops can I use?
4. How shall I terminate it?



Without herbicide !!!

- Rarely winter killed in high tunnel
- Chop and incorporate at once to reduce time of drying and decomposing
- Use of roller crimper to use the cover crop as a mulch

➤ End