No Till Vegetable Gardening
David E. Lott, Horticulture Educator

Learning Objectives

• Know the difference from conventional tillage.
• Know the benefits of no-till gardening.
• Know how to start or covert to no-till.
• Know how to control weed pressure and disease.
• See what long-term success looks like!
Conventional Tillage

- Breaks down the soil structure

- Breaks down bacterial population and earthworm populations that increase drainage and plant health

- Alters the pH and macronutrient levels of N,P,K

- Tilled soils tend to have a lower bacterial content

No Till

- Allows soil structure to build up over time.
- Helps build up beneficial soil fungi populations.
- Soil pH and macronutrients stay fairly even.
- Encourages earthworms to populate and till soils.

https://plants.ces.ncsu.edu/garden_detail/vegetable-no-till-garden/
The Difference..

- Perception and “garden look” can be tough to change.

- Cleaned till garden plots versus “messy”

- No till plots are multi year with organic matter and plant material.

- Conventional tillage can stir up weed seed to germinate.

Photo Credit: Mother Earth News
Historic Perspective

- No till is more like vegetable gardens from past generations

- Conventional tillage really took off in the 20th Century.

- Increased use of tillage, clean plots, and pesticides. Especially starting in the 1930s.

- Continued cropping, tilling, pesticide use has brought problems.

Why People Are Changing…

- Mismanaged ground from continuous cropping.

- Reduced organic matter and alter soil holding capacity.

- Dealing with weeds emerging from tillage.

- Conserving moisture levels, building up bacterial populations.

- Allowing earthworms to do the tilling work!
Putting Into Practice

Start Covering Ground Now!

• Lay a layer of cardboard or shredded newspaper, nor more than inches deep to cover weed prone areas. Scalp down weeds if needed.

• Alternating layers of “brown” and “green” layers of organic matter. No more than two inches deep.

• “Brown” – sawdust, leaves, corn stalks, pine needles, peat moss, straw and hay

• “Green” – kitchen scraps, coffee grounds, composted manure, soybean, cottonseed, and blood meal
Time Factor..

- Supplemental water may be needed in areas to help break down the first layers.

- Exposure to the environment (temperature, snow, heat, wind) helps break down these layers.

- Breaking down layers increases organic matter over time, preparing an inviting seedbed and growing environment for plants.
Earthworms Moving In…

- Stopping tillage encourages earthworm species to move into garden spaces.

- Different worm species live at different soil depths
- E.g. Nightcrawlers are deep dwellers, and red wigglers are shallow dwellers.

- Earthworm species break down soil through their burrowing activity from the soil surface, going deeper.

https://www.extension.purdue.edu/extmedia/ay/ay-279.html
Garden Planning

• Planting directly into the newly build seedbed.

• Plant roots help break soil loose.

• Root crops help break up tight soils and hardpan layers.

• Rotate crops by plant families to avoid plant disease and replenish nitrogen replenishment.

Crop Rotation Plan

Fairfax County Virginia Extension Master Gardeners
https://fairfaxgardening.org/planning-vegetable-garden/
Encouraging Beneficial Insects

• Plant pollinator beneficial plants on margins of garden spaces and between rotations.

• Consider planting annual herb species that can be planted and rotated near vegetable crops each year.
• (Avoid herb species that are invasive)

• Cut off beneficial plants and annual herbs at the soil level in the fall.
Management Tips

Warming Soils

• No till gardens usually are cooler soil temperature wise

• Conventional tillage gardens warm up sooner.

• In exchange, conventional gardens stir up weed seed to germinate and moisture loss.

• Solarize soil with plastic layers to warm up spots, especially for warm soil crops such as tomatoes, peppers, eggplants, okra, etc.
Irrigation

- Lay out drip irrigation in planting rows and blocks.

- Irrigate as needed by crop’s needs.

- Generally, no-till gardens retain soil moisture, and may require less irrigation.

- Lightly cover drip lines with mulch, leaves, hay to reduce moisture loss and suppress any weed growth.
Weed Control

• Pull weeds as soon as they come up.

• As “lasagna layers” build, more weeds will be prepressed.

• Not tilling keeps weed seed buried and not allowed to germinated
Avoiding Pesticide Use

• Pesticides drive away earthworms!

• Pesticide residue are on the crops, and harvest intervals have to be observed.

• Crop rotation and encouraging beneficial insects help control disease and insect problems.

• Be vigilant and scout for diseases. Do not compost diseased plant material.
End of Cropping…

• Cut off stems of plants. Leave the roots in unless they are diseased.

• Compost plant tops if they are not diseased.

• Start the fall “Lasagna” mulch layers in cleared areas

Lasagna Method

• Done in Fall or Late Summer:

• Add a 6-inch layer of cardboard and/or newspaper.
• Add a 2-inch layer of “green” next.
• Sprinkle on a layer of cottonseed, soybean or blood meal.
• Add a 2-inch later of “brown” next.
• Repeat green layer, meal layer and brown layer.
Cover Crops

- Purchase and scatter cover crop seed, such as oats, turnip, rye, etc. on top

- Irrigate these areas as needed to help germinate.

- Allow cover crops to growing and establish from late summer through early spring.
Fall Leaves

• Shred and dump layers of leaves into the garden area along with growing cover crops.

• Allow for a light layer that is well spread out to not suffocate cover crops.

• Weed free hay or straw can also be scattered lightly on top.
References

• Create Vegetable Beds With “Lasagna” Mulching
  
  https://extension.oregonstate.edu/news/create-vegetable-beds-lasagna-mulching

• Low and No-Till Gardening
  
  https://extension.oregonstate.edu/news/create-vegetable-beds-lasagna-mulching

• Mulch Is A Key to No-Till Gardens
  
  https://extension.oregonstate.edu/news/mulch-key-no-till-gardens
References Continued…

• No Till, Permanent Beds for Organic Gardening
  • https://smallfarms.cornell.edu/2016/01/no-till-permanent-beds/
• Reduced Till In Your Garden
  • https://extension.umn.edu/yard-and-garden-news/reducing-tillage-your-garden
• Weed Control In No-Till Gardens
  • https://extension.sdstate.edu/weed-control-no-till-gardens
• Work Less and Grow More Vegetables With “No-Till” Gardening
  • https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=41496

Questions?

• David E. Lott
  • Extension Horticulture Educator
  • Lincoln-Logan-McPherson Extension
  • 348 W. State Farm Road
  • North Platte, NE 69101
  • (308) 532-2683 – Office
  • dlott2@unl.edu