No Till Vegetable Gardening

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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!

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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 has a lower bacterial content

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https://extension.uga.edu/publications/detail.html?number=B577&title=Home%20Gardening

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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.

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

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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.

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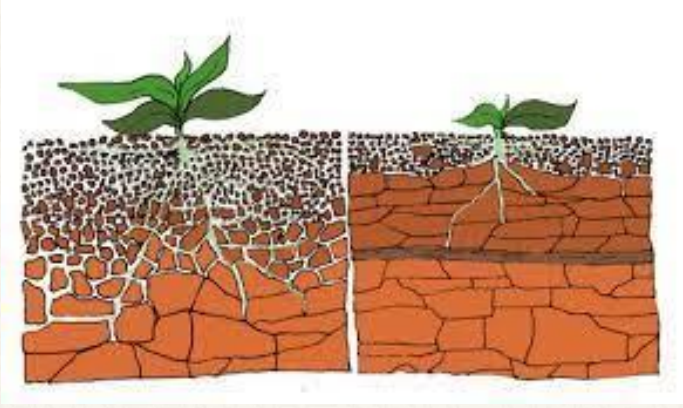

Photo Credit: Mother Earth News

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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.

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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!

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Putting Into Practice

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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

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https://agrilifeextension.tamu.edu/library/gardening/composting/

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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 increase organic matter over time, preparing an inviting seedbed and growing environment for plants.

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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.

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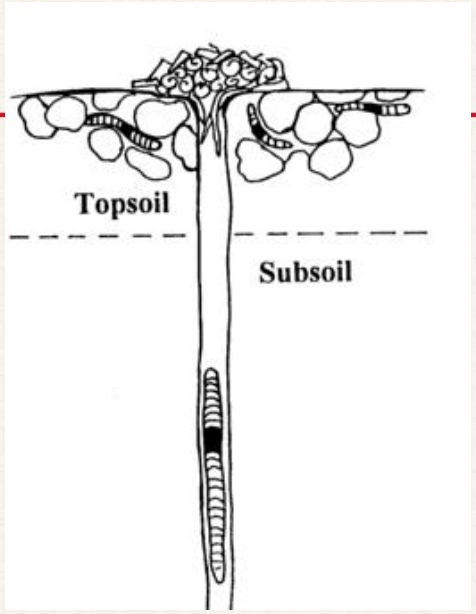

https://www.extension.purdue.edu/extmedia/ay/ay-279.html

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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.

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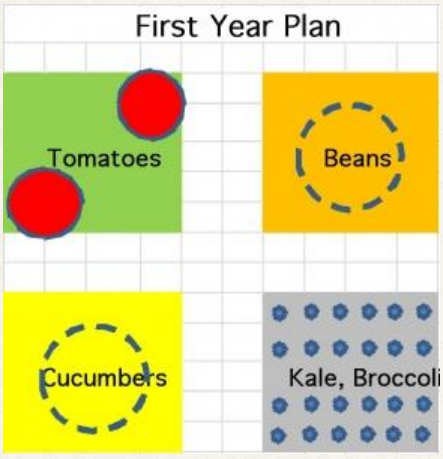
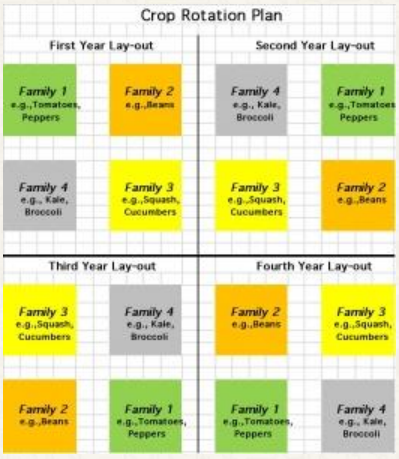
Crop Rotation Plan





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

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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.

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If you want to attract GOOD BUGS to your GARDEN – don't spray poisons!

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Management Tips

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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.

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https://www.aces.edu/blog/topics/lawn-garden/soil-solarization-for-control-of-nematodes-soilborne-diseases/

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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.

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https://extension.illinois.edu/news-releases/garden-vegetables-need-water-survive-extreme-weather

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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

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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.

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Late Summer/Fall

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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

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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.

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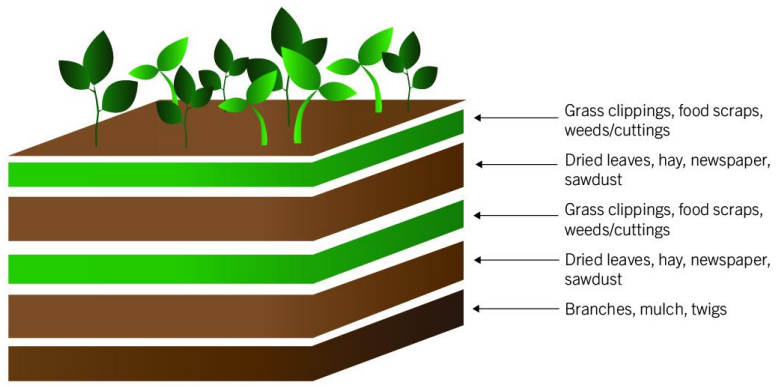

https://hgic.clemson.edu/lasagna-gardening/

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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.

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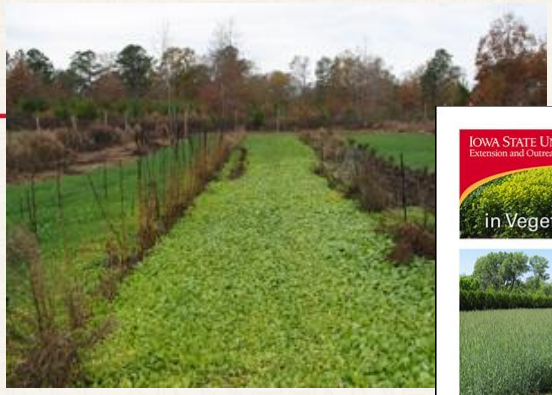

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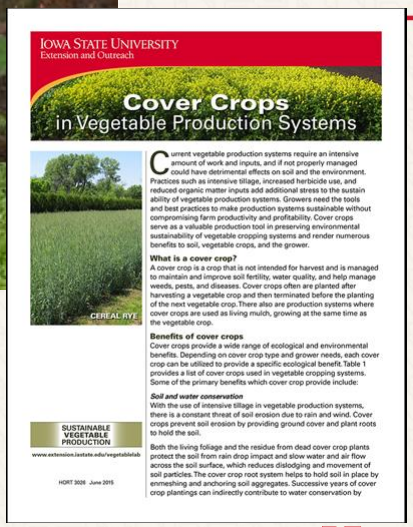
https://store.extension.iastate.edu/product/Cover-Crops-in-Vegetable-Production-Systems



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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.

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Photo Credit: www.russellnursery.com

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- Low and No-Till Gardening https://extension.oregonstate.edu/news/create-vegetable-beds-lasagna-mulching
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- Work Less and Grow More Vegetables With “No-Till” Gardening
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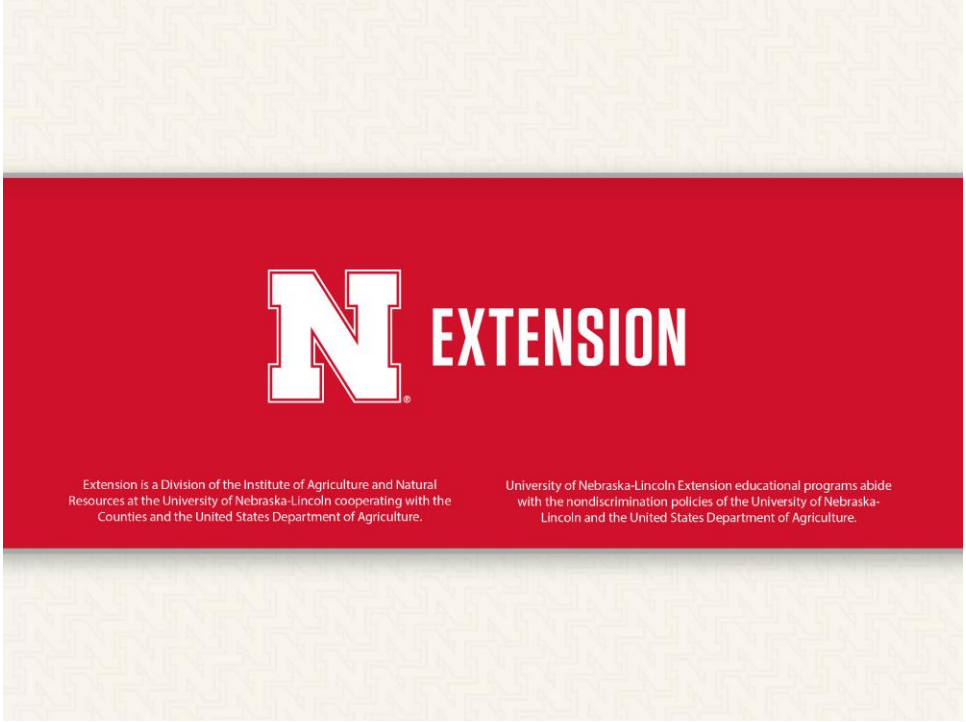
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