Small Scale No-Till Methods

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What are Small Scale No-Till Methods?

How can no-till improve my garden?

Is no-till the only way forward?

I have a small raised bed can I no-till?

How do I no-till a field, I don’t have specialized equipment?

How do I keep weeds back or eliminate weeds to start growing no-till?

Soil Health

There are 4 basic principles for good soil health:

- Keep the soil covered as much as possible
- Disturb the soil as little as possible
- Keep plants growing throughout the year to feed the soil
- Diversify crop rotations as much as possible, including cover crops

Tools in the tool chest

As farmers and gardeners we have a lot of tools, each one has a specific purpose

Don’t get fixated on one tool, i.e. one way of doing things

Use everything available to you

Branch out, experiment, have fun

Mimic Nature always

What is No-Till?

Instead of preparing the soil by digging or overturning No-till gardening builds up the soil through the application and decomposition of mulch and cover crops

Benefits include: Preventing erosion, building up of soil organic matter, slowing down weeds building soil structure,preserving soil moisture, cutting down on labor and costs

Working with Nature, never against it

Do you ever find tillage in nature?

Nature is always building

Leaves fall, grass lays down, trees fall and everything is absorbed into the soil

You find balance in nature and to have balance in your garden you must do the same as nature

Look at your land

Sunlight

Water

Close to house

Lay of the land, how does water run off? Or pond?

2 methods of doing no-till

Short and long

Short takes a few weeks: Mow, till, amend, cardboard, compost, dirt, mulch, plant

Long takes a few months: Mow, amend, tarp for a few months, mulch, cover crop, tarp, plant

Whichever method you do, always, always **do a soil test**

No Till usually involves a lot of layers, compost, mulch, soil etc

If you don’t have access to all the supplies you need, landscape fabric is a great way to mulch an area and plant into the tarp

Soil coverage, water seeps in slowly, no erosion compost protected from weeds

Keep in mind, brand new no-till beds or gardens sometimes don’t do great the first time or two

Maybe it’s poor soil to begin with, or the nutrients need to be broken down to accessible forms for the soil life and plants

Don't be averse to using synthetic fertilizers

Use as needed and focus on composts to provide nutrients

Raised Bed No Till

Make your raised bed, and place it in the area

This can be bare soil or grass

Put down a layer of cardboard or weed mat covering the entire bottom

Place a layer of sandy loam soil and compost until you reach halfway up the bed

Place another layer of cardboard

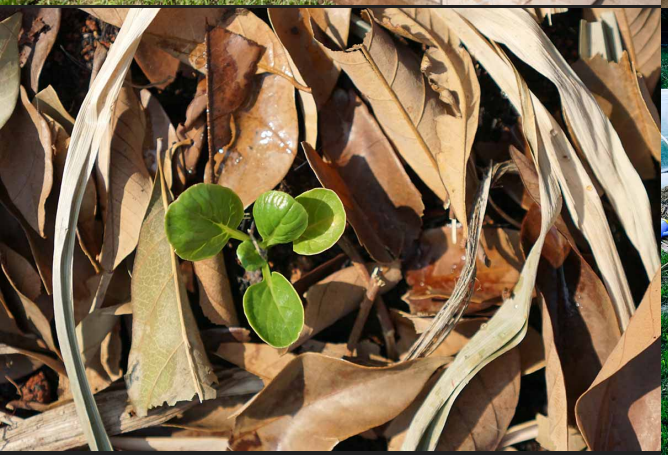
Put 6-8in of compost on top of the cardboard and plant into that

With raised beds you can make them out of wood, fake wood or metal

Metal seems to last the longest

You can also find them in different shapes then the traditional rectangular shape



When the growing season is done, cut down plant matter and add it to the bed

Add compost, leaves, straw etc and then cover with a tarp to decompose over the winter

In late winter add another layer of fresh green compost and brown matter and cover till spring planting

Spring planting happens when the soil temp warms to 45 degrees consistently

The techniques I am going to cover are primarily natural or organic

No-till conventionally is done by applying an herbicide to kill grass and then planting directly into the residue and repeating the process over and over again

In nature nothing is taken out without a replacement to take its place

Soil can and is depleted by agriculture and it’s our job to build it up and keep it healthy

No till is a repetitive or **cyclical process**

Continually adding compost, OM (Organic Matter) to keep the soil fed

Wet OM after layering to aid in decomposition

This process is the same whether you have a raised bed or garden or tunnel

The only thing that changes is the amount of compostable matter to be applied each season

No-till in the garden

Lets scale things up, say you have a 50x100ft garden or 25x25ft garden

Expansion time, you can till the entire area or just where the beds are going to be

Put down cardboard or newspaper (Not the ads) and put compost down

I have added a layer of straw or leaves on top of the compost and then planted directly into that

That added layer of straw or leaves protects the soil and provides a food source for soil creatures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If you are going to direct seed I usually sow the seeds and then put the OM on top and wet it down

In the garden I use a seeder, in a raised bed a rake works good for making the furrow and covering

For transplanting I will make the bed completely and then plant through the OM

Make sure you water the beds well

You do not need to water as often as the soil will hold moisture longer with the covering of mulch

Water, the heat from decomposition and the soil organisms will aid in breakdown of the plant matter

Composting is important

You can make your own compost or buy from a nursery

Stockpiling the compost and covering with a tarp helps keep it weed free

It also helps continue the decomposition process

Over time you will find your compost teeming with soil life

Transitions between crops

When a season is done and you terminate the crop mow and leave the roots in the ground

This is a food source for soil organisms

As roots decompose they leave pathways and open the soil up for better airflow, water infiltration and nutrient movement

I’ve used wood chips for my walkways and straw

You will run the risk of ants if you put down a lot of wood chips

Wood chips take a long time to decompose and can tie up nutrients during the breakdown process

Straw breaks down quickly and can be incorporated into the soil sooner

You can put a layer of cardboard in the walkways or a light layer of compost

Pathways can become compacted with with use, adding OM feeds the soil organisms and helps build healthy non-compacted soil

Using a broadfork helps to open up compacted soil

Cover crops in your walkways

Weed control methods

To control weeds in no till you want to keep the soil covered

Layers of compost, cardboard, straw, leaves and tarps can massively cut down on grasses and weeds

Prior to planting or seeding you can also run a flame weeder over the bed to kill any germinating weeds

Landscape fabric

Solarization, clear plastic

Hay and straw work really well when added as layers between the compost

Alfalfa hay provides nitrogen and potassium to the soil

Layering compost, and straw or hay and more compost with a cover on top really works well

Brown materials add carbon and food for the soil creatures

I will usually prepare my bed and water it

Putting plastic over the bed for a few days will allow germination to occur

Weeds will start to sprout, then you flame them

Plant directly after this and cover your beds with mulch

No-till in high tunnels

The same methods and principles apply to high tunnels as they do to field and raised bed no-till

Adding compost, straw, leaves or tarps work well in a tunnel

Tunnels act like micro climates allowing plants to grow faster, better and usually with less pest and disease pressure then in the fields

Cover crops for no-till

Cover cropping is a way to improve the soil and add lots of biological organic matter to the soil

Think of it as a way to make and add compostable materials to your soil en mass

Keep in mind that whether you are doing a raised bed, tunnel or field no till you must be ready to terminate and incorporate the cover crop into the soil

Cover crops can be used in addition to adding compost

This combo gives soil the best start

Once you terminate your cover crops you could tarp and let it all decompose

Come back in a few weeks or a month and plant

No-till and cover crops and compost, soil coverage is all done for the health and benefit of the soil

Planting cereal grains, wheat, rye, barley, oats, will give you a lot of biomass

These covers can be crimped, and this causes the cover crop to lay down providing a cover, a mulch on top of the ground

You then plant into this residue

Make sure you planted thickly, you don’t want weeds poking through


CRIMPED
MOWED

You want cover crops that don’t take a long time to grow

That terminate easily and are easy to put into the soil

Short growing covers like white clover work well for pathways as they can stand a lot of traffic

White clover can also be used as a living mulch on the bed and your cash crop be planted in it

Cover crops by themselves do not add nutrients to the soil

They act as scavengers gathering left over nutrients from the previous growing season and holding them

Or gathering nutrients from the air such as nitrogen and storing them

When cover crops are terminated they release these nutrients right at the root zone of cash crops

Allowing for ready absorption of nutrients

Some cover crops that I have used in to till systems that work well are:

White clover

Buckwheat

Tillage radishes

Forage turnips

Cow peas

Red clover

Peas

Sunhemp

Most of these cool season cover crops will winter kill or for warm season cover crops I will mow and leave the residues on the bed

Nitrogen and carbon storing cover crops work well together

Root crops like turnips and radishes once terminated rot in the soil producing pathways for air and water infiltration

Think nature’s tillage

Some people will let the cover crops winter kill in southern climates that may die in January or February and then they tarp the area or just leave the area exposed and come March or April plant directly into the soil/residue.

If you have cover crops that left a lot of residue behind it may be beneficial to tarp the area for a few weeks or a month to make sure the the residue has time to break down

In tunnel or elsewhere you don’t have to let the cover crops grow to maturity

If you just have time for them to get 2-3in tall before termination that's fine

Every little bit helps, you always want plants growing in your soil

Resources

https://joegardener.com/podcast/no-dig-gardening-charles-dowding/

https://youtu.be/sdmqbhQo-yw?si=hvb0eFcJYii5Pvex How to start a No-till Garden from Scratch

The Living Soil Handbook, Jesse Frost

The Organic No-till Farming Revolution, Andrew Mefferd

The No-till Organic Vegetable Farm, Daniel Mays

Organic No-till Farming, Jeff Moyer

Winning the War on Weeds, John Moody