PROFILES IN
soil health
Crystal Runge
Backyard Garden
Brookings, South Dakota
Mixed Vegetables

Gardener Tries a New Approach with Success

When her husband pulled a muscle, putting him out of commission this spring, Crystal Runge was unsure how she would get her garden tilled in time for planting vegetables.

Runge, who has tended her backyard Brookings garden for 14 years, works as a geographic information specialist at the regional Natural Resources Conservation Service office. When she brought up her predicament to her agronomist co-worker and fellow gardener Eric Barsness, he had an obvious question:

“You work for this agency and you have not no-tilled yet,” he asked her.

With his encouragement and some internet research, Runge dived into no-till gardening and took it a step further with other conservation-minded methods: companion planting, layering ground coverings in a technique called “lasagna gardening,” and planting cover crops. Her husband questioned what seemed like some strange gardening practices, but with his injury, he could only set back and watch and wonder.

There is good reason to try this kind of approach, according to Barsness. It is all about soil health, he said, and healthier soil means more nutritious food and healthier people. By the end of the season, the Runge’s were able to see the many ways their new approach to gardening paid off. “This year was kind of an experiment,” Runge said.
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Crystal Runge Backyard Garden

Three keys to getting started with no-till gardening:
1. Leave or add residue.
2. Reduce soil disturbance or tilling.
3. Use a cover crop to keep a living root in the soil as long as possible.

The first test was with her potatoes. Runge did not get them in the ground by Good Friday, but she placed them on top of the ground. Instead of digging into the soil to plant spuds by the date recommended in long-held gardener lore, she laid her potatoes on the soil surface and covered them with hay.

Barsness has done the same thing for the last three years in his garden. Every year, he is sure it is not going to work, but soon the leaves pop through the hay and potatoes grow in their moist, shaded bed. Harvesting is easier, too.

When Runge asked her 11-year-old son to grab some garden potatoes for supper one night, he ran for the tool shed to grab the potato fork. It was not necessary, he learned. All he had to do was lift the hay and pluck a few potatoes for the meal. You can harvest as many as you need without killing the whole plant, Runge said, and they are not caked in dirt.

The Runge's planted onions the same way. For other crops, such as sweet corn, squash, and tomatoes, they hoed rows for seeds and starts. From there, the garden got layers of hay, grass clippings, shredded paper, and manure to provide nutrients, keep weeds down and keep moisture in.

First came a layer of shredded office paper, making it look like it had snowed in early June. The paper was wetted down so it did not blow away and topped with grass clippings. A layer of hay went on a week later, and a little more than a week after that, Runge put down 50 bags of steer manure purchased at a garden center in town. More grass clippings went on top.

It is material Runge used to bag and set on her curbside for the city waste department pick up and haul away. Now she is putting it to good use. “I have got the stuff. Why not use it?” she said.

Even the post-harvest garden waste – corn stalks, cucumber, and potato vines – gets chopped

April 14 – Planted potatoes and onions
May 15 – Planted the rest of the garden, including corn, green beans, squash, tomatoes, and peppers
June 6 – Put down a layer of shredded paper, wetted and topped with grass clippings
June 14 – Put down a layer of hay
June 16 – Harvested first crop of strawberries
June 23-24 – Added a layer of steer manure topped with grass clippings
July 19 – Corn was tasseling, first cherry tomatoes and cucumbers were ready for harvest, second strawberry crop harvested.
Aug. 15 – Picked first corn, pulled cucumbers and planted a cover crop in their place.
Aug. 21 – Harvested corn, cut up stalks to place on garden. The cover crop had emerged.
Sept. 7 – Harvested potatoes, added manure to the area and planted a cover crop.
Sept. 14 – Cover crop had emerged.

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Up and returned to the garden. As for the manure and decomposing grass, she said it did not smell. The process to plant and mulch section by section took some patience, Runge said, but she found things she liked in this layered “lasagna” approach. “The joy of this is when you walk out there, it is soft,” she said.

Lack of weeds brought even more joy. If weeds popped up, Runge smothered them in more grass clippings. That is what usually sells people on no-till gardening, Barsness said. “As soon as you talk about not having to pull as many weeds, you get a lot of people’s attention,” he said.

He’s seen the same with farmers getting into no-till and crop rotation management on their fields. The key is not letting the weeds go to seed, he said, then after three years, there is hardly a weed problem. Having residue on the surface increases water infiltration, so when it rains water goes into the soil instead of running off. That means less watering.

Another way Runge tried to help her garden vegetables along was through companion planting, which involves growing different kinds of plants beside each other or even in the same row. The companion plants help make nutrients like nitrogen more readily available for the corn to use. They also provide ground cover, keeping weeds from growing.

Runge planted squash and pumpkins beside her corn rows, and she planted green beans within the same row as the corn. Barsness recommends that gardeners seed their companion plants after the main crop is well established. The corn should be about knee-high when its companions are planted, so it is not competing for water and nutrients. Runge planted hers together at the same time with no problems.

Runge saw the benefits of companion planting in her healthy, high producing sweet corn stand. Rows with companions were tall and green, while one row without companion plants was yellow and stunted and the ears of corn each had knobs at the top where the kernels did not fill out. She saw how companion planting strengthened the plants. The garden was hit by two storms that flattened the corn stalks. Normally, she would help prop the plants up again. This year, she decided to let them go, and they soon stood up on their own. “It makes for healthier plants,” Runge said.

She especially liked how companion planting helped get more out of her small garden. It produced a bumper sweet corn crop and just enough beans for her to enjoy in-season. At the end of the season, she got her largest ever sweet corn harvest. Five rows of corn filled a laundry basket, and she froze 17 bags of it.

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**Take the “Tighty Whities” Test**

The “Tighty Whities” Test is a comparative test that shows the presence or absence of soil microbiology under different management techniques. Since the cotton “tighty whities” are made from organic material (not including elastic), the soil microbiology will feed on them if microbes are present. The less “tighty whitie” material left, the more soil microbiological activity.

- Choose locations, field or garden, with different management techniques that you want to compare (ex. Long term no-till vs. conventional till).
- Bury “tighty whitie” in each field 2-inches deep and mark the location where you planted the whities.
- Dig out remains 6-8 weeks later.
- Visually compare remaining material.
- Compare weights of the “tighty whities.”

*Notes*

- Works best during May through June and not as well in July through August.
- Can also compare different grassland management systems.
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Runge planted a cover crop after harvesting each area, which was another new gardening practice for her. Throwing on a mix of nine species – common vetch, flax, field peas, forage variety radishes, rapeseed, turnips, oats, cowpeas, and millet – she covered it with straw and was surprised to see it leafing out within a week.

Runge liked the layered “lasagna” approach. “The joy of this is when you walk out there, it’s soft.”

- Crystal Runge, homeowner

The seeds are available at local elevators and seed dealers. Most are happy to give gardeners smaller quantities of the mixes they sell to farmers, Barsness said. He suggests using a seed mix of cool-season crops. The goal is to get as much growth as possible before the freeze. The plants in the mix will be killed and decompose over the winter, leaving not much more but their nutrients and loosened soil in the spring.

Gardeners tend to think that no-till and cover cropping is for the big guys like farmers and large-scale gardeners, Runge said. But she put the conservation practices to work on her backyard plot, which measures about 15 feet by 50 feet. No-till gives gardeners the same benefits farmers enjoy, Barsness said. Plants can easily get started in the loose, healthy soil as compared to the tightly compacted tilth that results from tilling year after year. “Every time you till, you take the air out. Pretty soon, your top soil is shrinking away,” Barsness said. As for Runge, she is happy to park her tiller, it was on its last legs anyway. Without the extra work of tilling and weeding, their new gardening style will save on her husband’s sore muscles, too.

Natural Resources Conservation Service

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