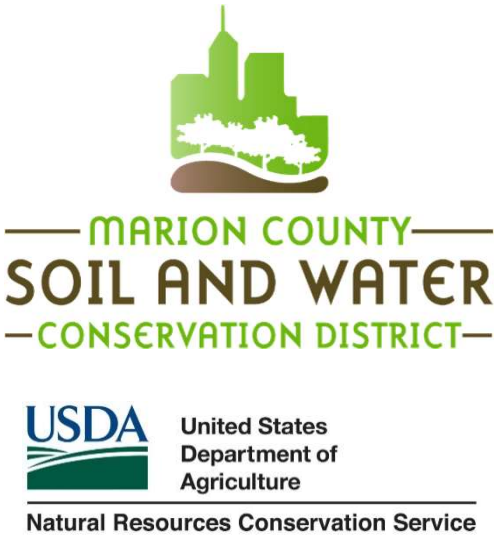
MULCHING



Marionswcd.org

Version: January 2018

Kevin Allison - Marion County SWCD

Mulching is applying plant matter or other suitable materials to the land surface.

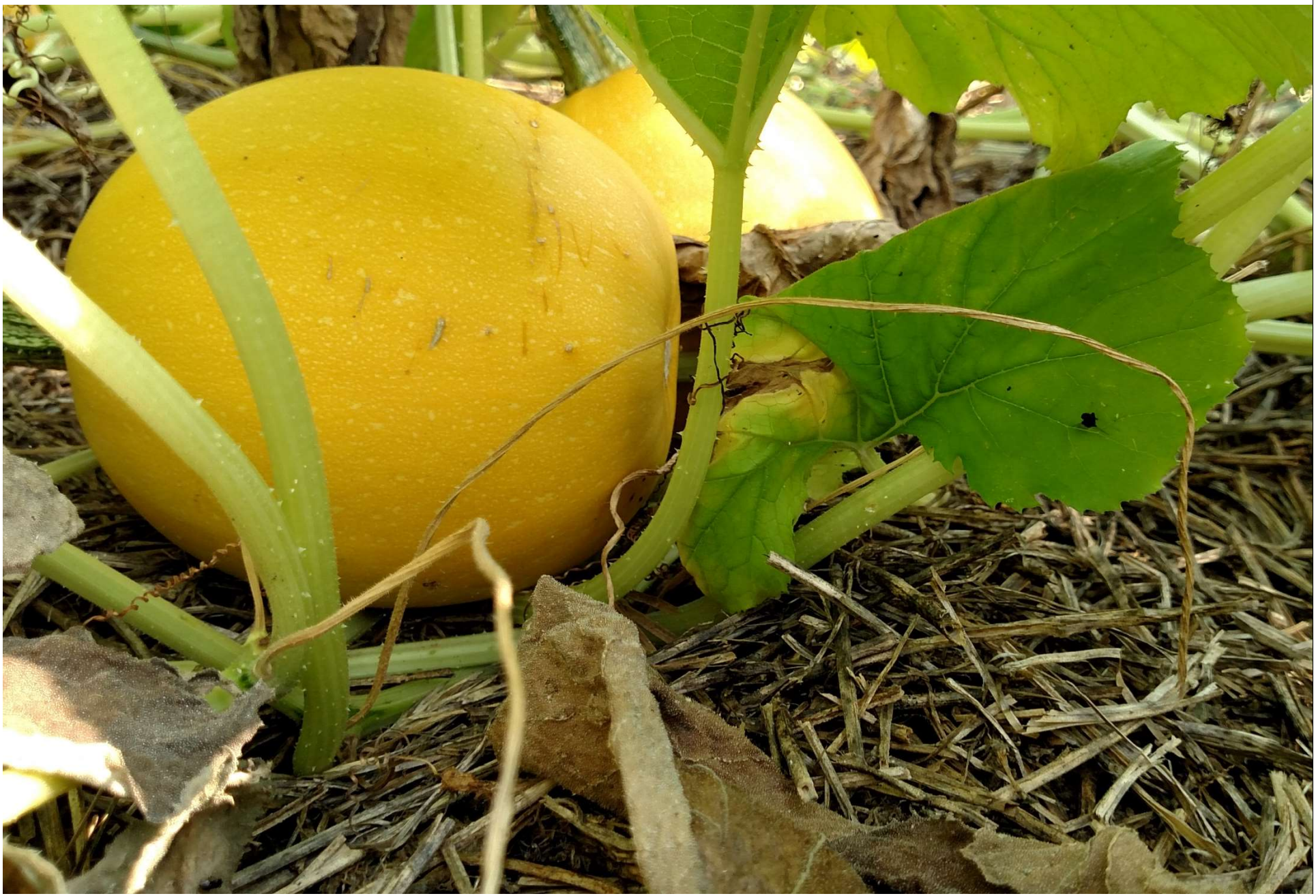
Small square straw bales is a commonly used mulch.

Benefits include:

- **Protects the soil from erosion**
- **Improves soil health**
- **Reduces compaction from the impact of heavy rains**
- **Conserves soil moisture, reducing the need for frequent watering**
- **Maintains a more even soil temperature**
- **Prevents weed growth**
- **Keeps fruits and vegetables clean**

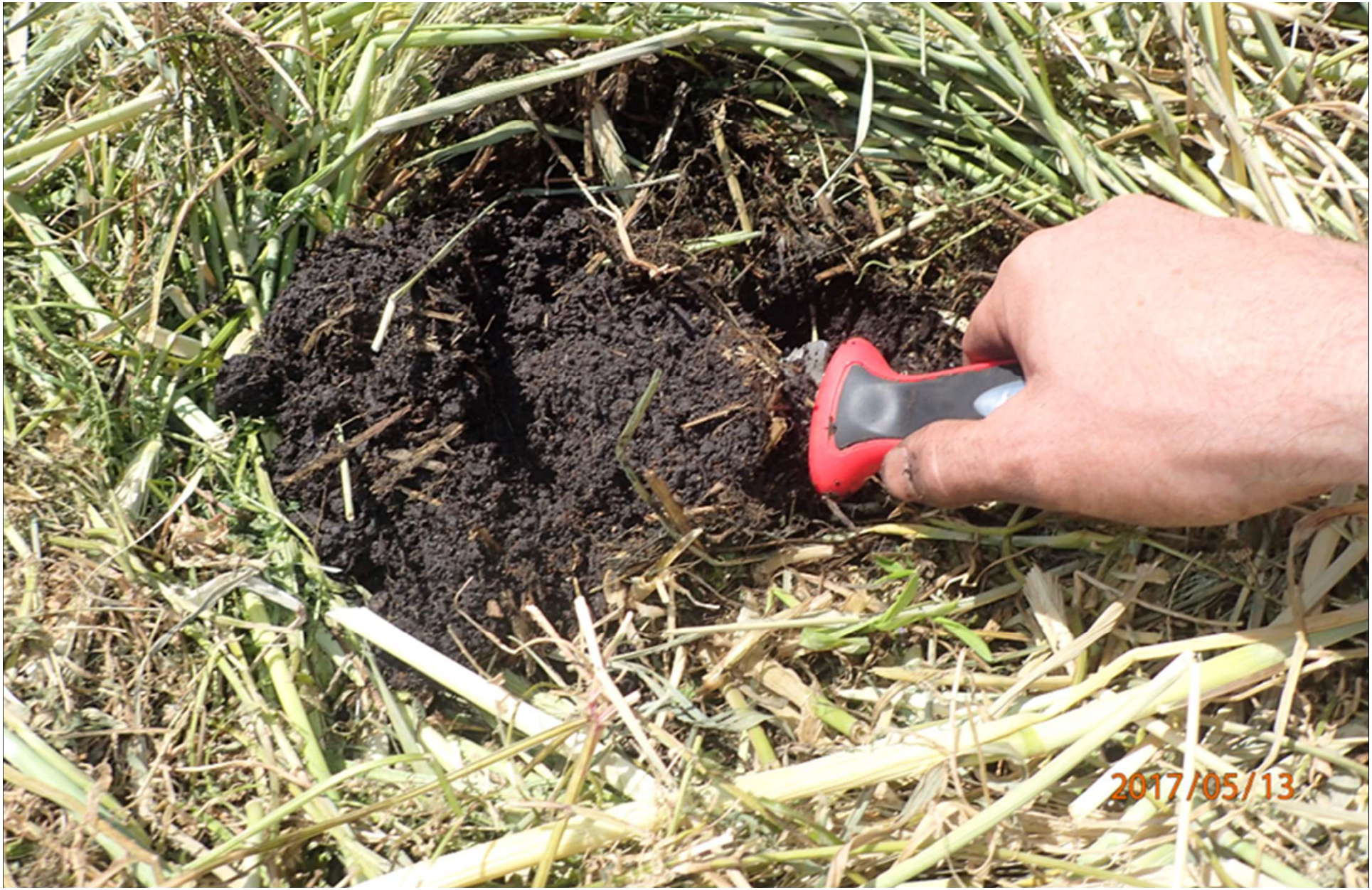
Mulches like straw, hay, and leaves can improve the condition of the soil. As it decomposes, it provides organic matter in the soil. Organic matter is a source of plant nutrients and provides an ideal environment for earthworms and other beneficial soil organisms.

Organic matter improves root growth, increases the infiltration of water, and also improves the water-holding capacity of the soil.



Mulch can provide soil health benefits, water conservation, and weed suppression. This farm uses straw to mulch 30 inch wide growing beds and walkways.

If transplanting the crop, the bed can be mulched before planting and then spaces created for the transplant. For direct seeded crops, growers often allow the crop to become hardy before applying the mulch around the growing plants.



Alfalfa mulch and spring broccoli

Mulch in the garden changes weed management. Mulch is often used to suppress weeds, and instead of multiple cultivation passes or hoeing, labor can be directed at spot hand weeding.

Mulch can also facilitate the establishment of vegetative cover. A layer of lightly packed straw conserves moisture and protects a no-till cover crop seeding of oats, radishes, and peas after popcorn.

A light alfalfa mulch conserves moisture for a vegetable seeding in a school learning garden.

Cover crops can be grown to provide mulch as well. In this example, a fall planted oats cover crop dies in the wintertime and is left to decompose in place. Furrows are created in the mulch residue where early vegetables can be planted.

Cuttings from the spring growth of a legume cover crop provides soil protection and contributes nitrogen to summer fruiting crops like peppers and tomatoes. Spaces are made in the cover crop residue where vegetable seedlings can be planted.

This image shows a cut down crimson clover cover crop covered with newspaper and alfalfa mulch. The layering of composts and mulches is often referred to as "Lasagna Gardening". Adding the cover crop's living root to the system during the off-season boosts soil health.

Not all mulches are created equally. There is benefit in knowing the source and how the mulch was made. Mulch material, to the extent practical, should be free of disease, pesticides, chemicals, noxious weed seeds, and other pests and pathogens.

Understanding the carbon-to-nitrogen ratios of crops and other material applied to the soil is important for managing soil cover and crop nutrient cycling. Mulches like straw can have a high C:N ratio and breakdown more slowly, whereas legume hay like alfalfa has a lower C:N ratio and can decompose quickly. The differences in mulch type and decomposition rates influence how nutrients behave in the garden. Straw can immobilize soil nitrogen and draw the much needed nutrient away from a crop, whereas legumes will readily decompose and can provide nitrogen to a crop.

Table 1. Carbon to nitrogen ratios of crop residues and other organic materials

Material	C:N Ratio
rye straw	82:1
wheat straw	80:1
oat straw	70:1
corn stover	57:1
rye cover crop (anthesis)	37:1
pea straw	29:1
rye cover crop (vegetative)	26:1
mature alfalfa hay	25:1
Ideal Microbial Diet	**24:1**
rotted barnyard manure	20:1
legume hay	17:1
beef manure	17:1
young alfalfa hay	13:1
hairy vetch cover crop	11:1
soil microbes (average)	8:1

slower

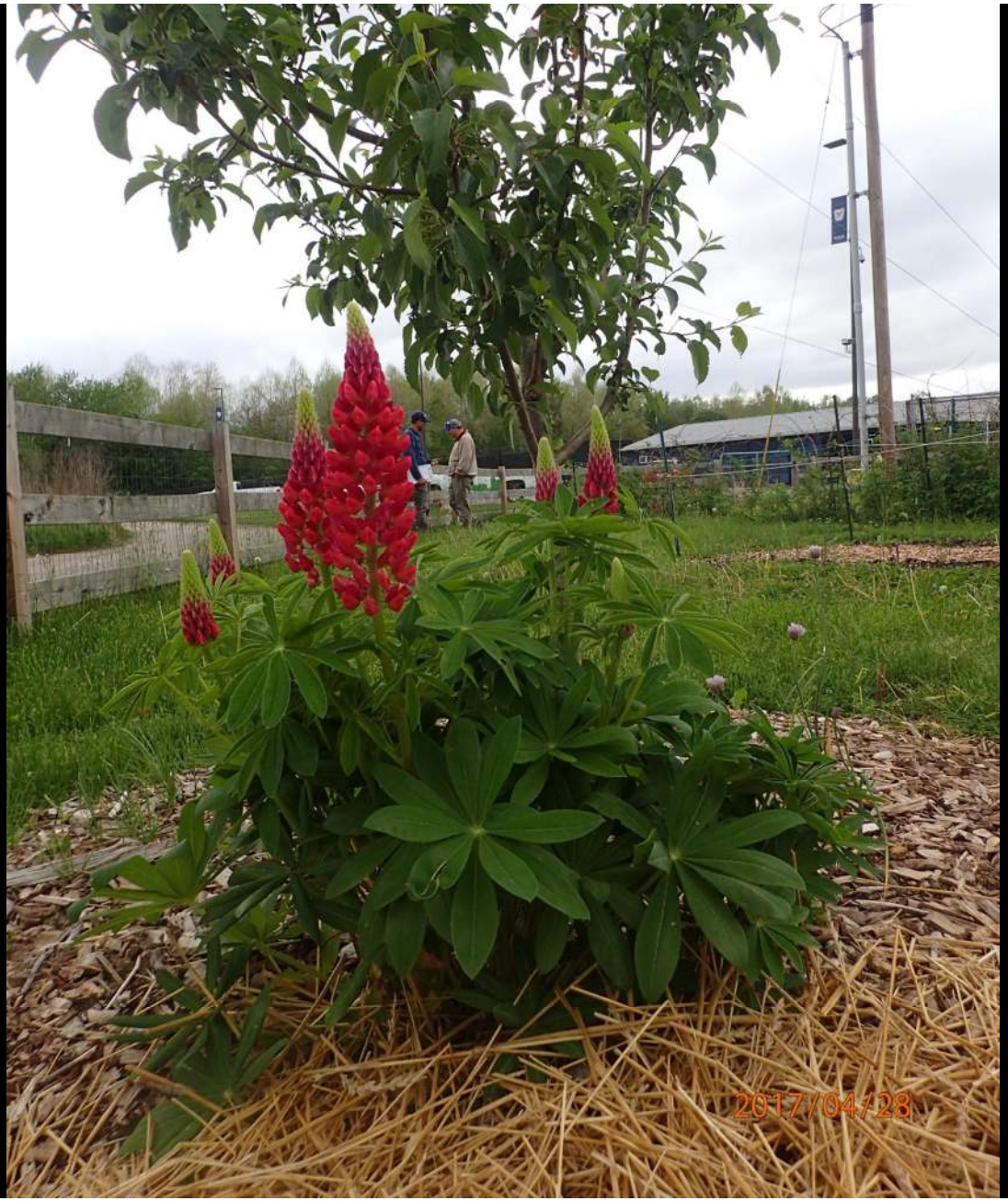
Relative Decomposition Rate

faster

General Helpful Hints

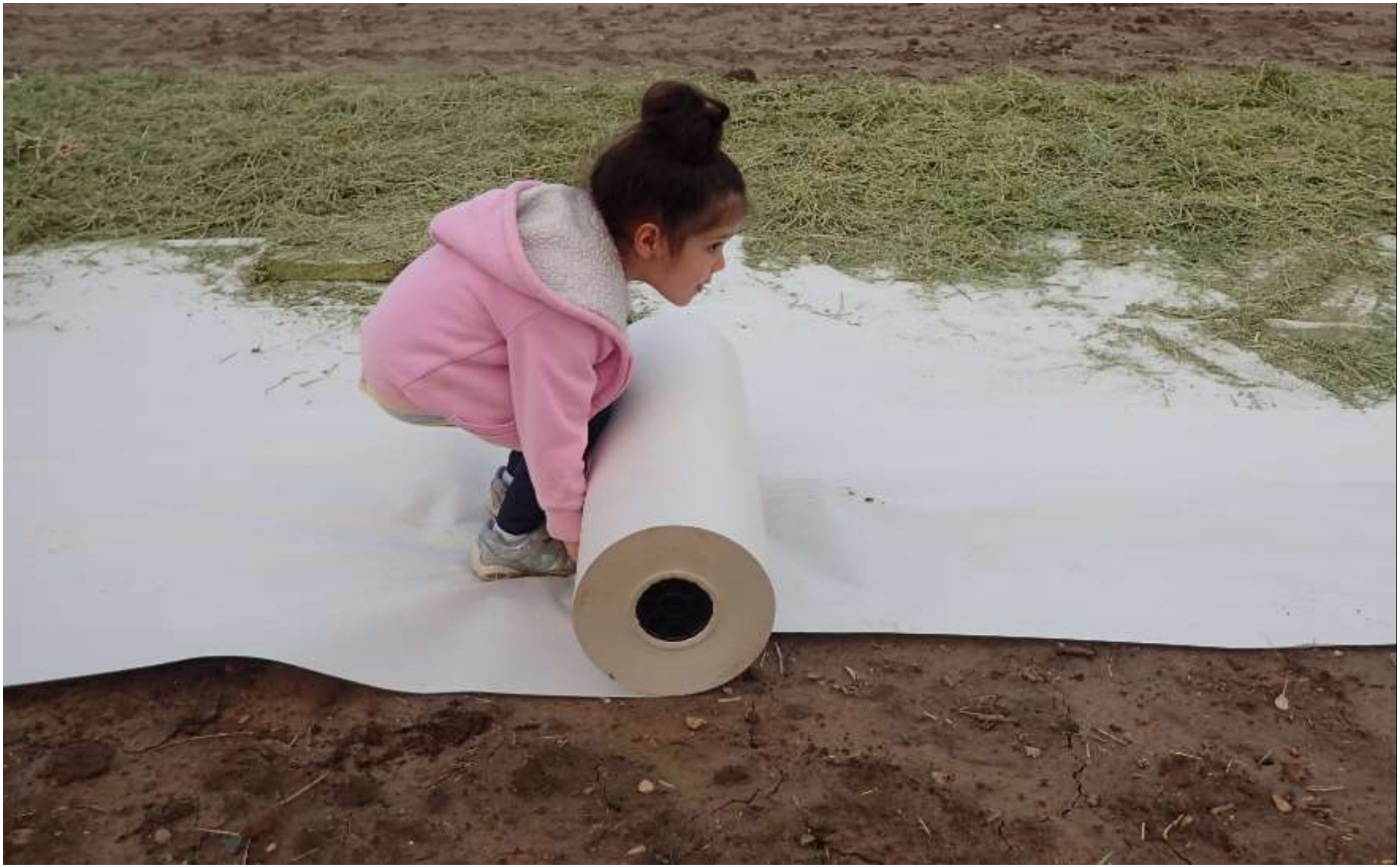
- **A general rule of thumb for optimal mulch thickness is 4 inches.**
- **Keep mulch 3” away from plant stems and crowns to prevent weeds and pest problems. Additional weed control may be needed around the plant base area.**
- **Keep carbon-to-nitrogen ratios in mind. When planting a vegetable or crop that requires a lot of nitrogen, keep the carbon-to-nitrogen ratio low. Below 30:1 is best.**
- **Mulch can provide nesting habitat for ground-burrowing rodents. Stay on top of scouting and develop a plan for control.**
- **Plant residues from cover crops can also be utilized as mulch.**
- **Mulch can slow soil warming in the spring and insulate the soil in the fall.**
- **Wood chip mulch can have a high carbon-to-nitrogen ratio and can draw nitrogen away from crops.**

Though high carbon inputs can tie up nitrogen needed for annual vegetable production, perennial plantings often fair well.

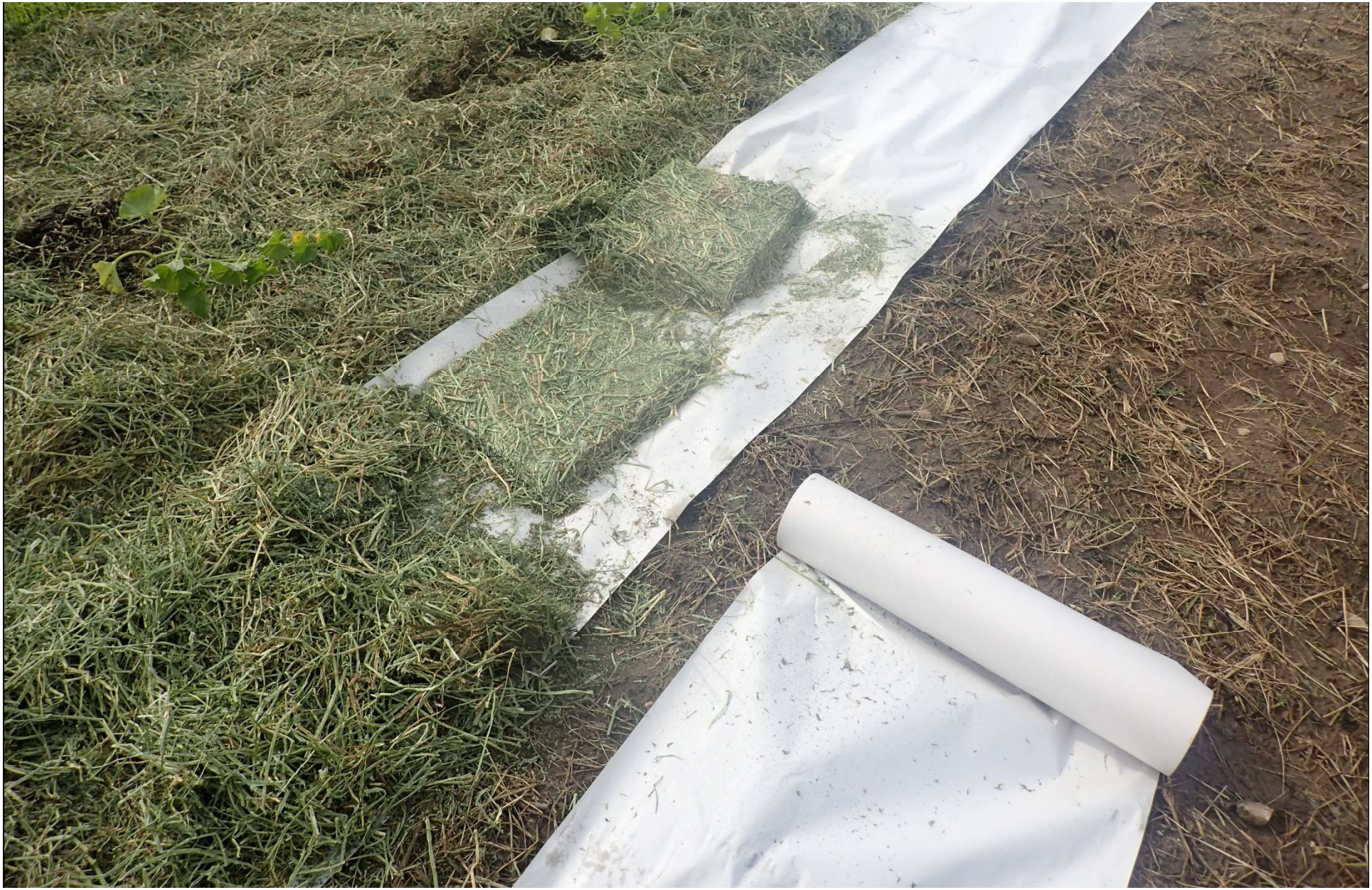


Leaves can be a readily available and inexpensive mulch. Growers often chop up or compost the leaves first, as whole leaves can stop rainfall from infiltrating into the soil. Beware of black walnut and black locust leaves, which can contain natural chemicals that impact plant growth.

In this community garden, tillage is used to eliminate weeds. To decrease the need for further tillage, the gardeners mulched up the area with paper mulch and topped it off with alfalfa hay before transplanting vegetable seedlings. Mulching damp soil can preserve the moisture into the season. Newsprint rolls can work well as a weed barrier and allows water to infiltrate.



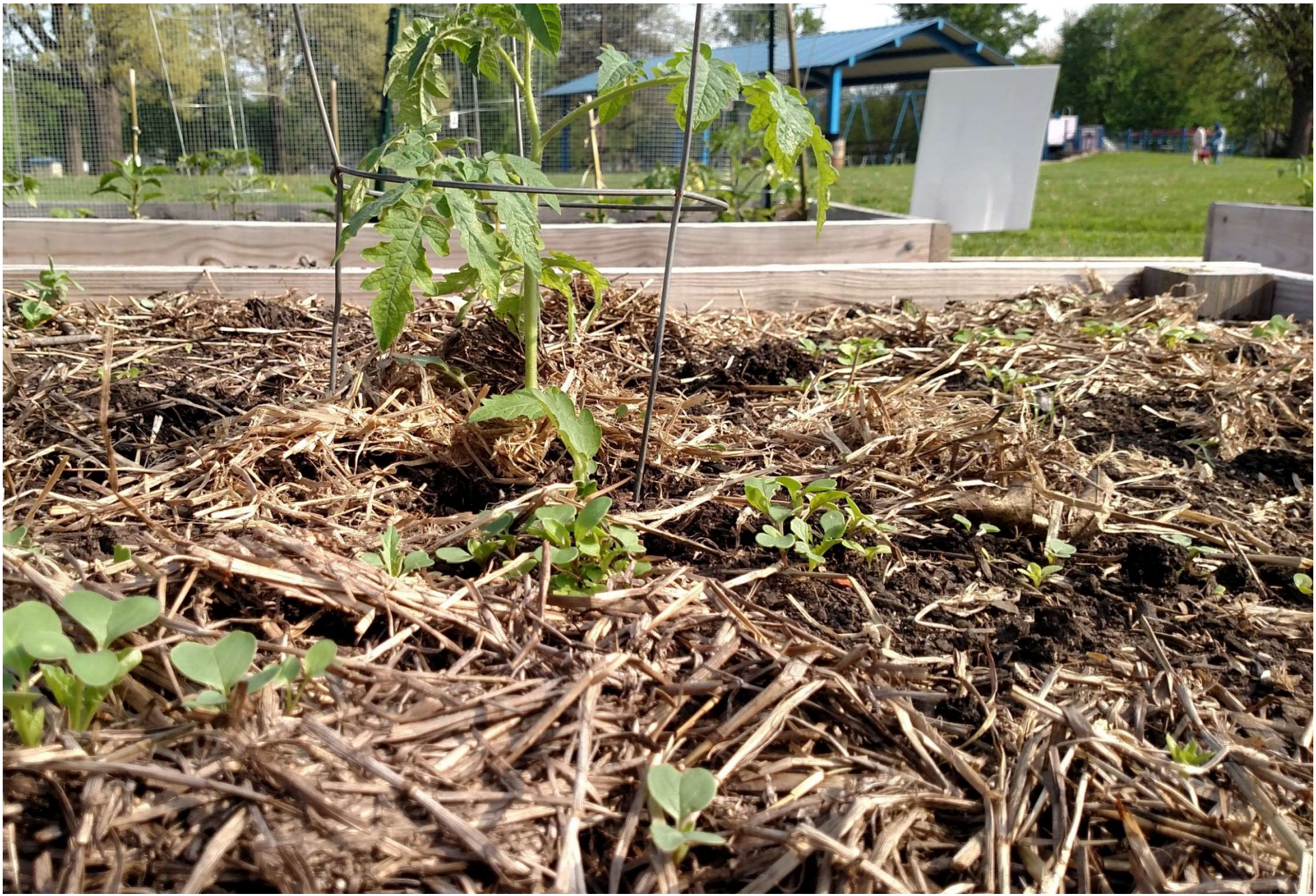
Mulching newsprint in strips allows for the legume mulch to directly contact the soil in the transplant zone. Though weed suppression may decrease without the paper, nutrients from the decomposing hay might become more readily available to vegetables.



Inorganic materials like black plastic and fabrics are also considered mulches. Growers should consider potential effects on soil health and drainage when using inorganic mulches. Temporary tarping can be used to terminate cover crops. Consider the permeability of the fabric and its ability to infiltrate water.

Like cover crops, mulch can also protect the soil during the wintertime. An average square bale of straw can cover approximately 60 square feet of growing space, depending on desired mulch thickness.

In the spring, the mulch can be managed for a vegetable planting. There are multiple ways to use mulch to protect and feed a healthy garden!



ADDITIONAL RESOURCES

MARION COUNTY
SOIL AND WATER
CONSERVATION DISTRICT

[NACD Backyard Conservation - Mulching]

[USDA-NRCS Carbon to Nitrogen Ratios in Cropping Systems] **(pdf)**

Soil Health Principles

1. Disturb the soil as little as possible.
2. Keep the soil **covered** as much as possible.
3. Keep plants **growing** throughout the year to **feed** the soil.
4. **Diversify** as much as possible