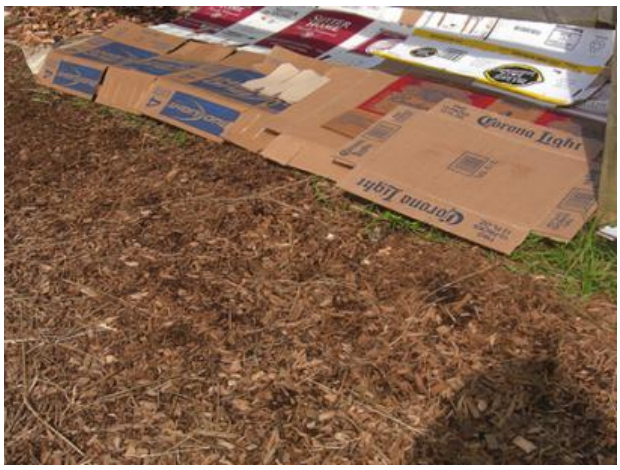
ACTIVITY 4: NO-TILL FARMING

Activity Objective: Build a corrugated cardboard no-till garden and grow a small crop of soybeans or Lima Beans

Materials: Chapter 14, paper, computer, printer, Internet Access, cardboard, soybean or Lima bean seeds.

Definition: Tilling is the process of removing plants or plant debris, usually for the purposes of planting more desirable species. This tilling can result in a flat seed bed or one that has formed areas, such as rows or raised beds, to enhance the growth of desired plants. The effects of tillage can include soil compaction; loss of organic matter; degradation of soil aggregates; death or disruption of soil microbes and other organisms; and soil erosion where topsoil is washed or blown away. All of these reduce the sustainability of the soil and plants. No-till farming dramatically reduces the amount of erosion in a field. While much less soil is displaced, any gullies that do form will get deeper each year instead of being smoothed out by regular plowing. This may necessitate sod drain ways, waterways, permanent drain ways, cover crops, etc.

Another benefit of no-till is that because of the higher water content, instead of leaving field fallows it can make economic sense to plant another crop instead improving water sustainability. Less tillage of the soil reduces worker labor, diesel fuel use, machinery costs and irrigation. No-till farming can increase organic (carbon based) matter in the soil, which is a form of carbon sequestration, which reduced the carbon-footprint and increasing sustainability. .



Some farmers who prefer to pursue a chemical-free management practice often rely on the use of normal, non-dyed corrugated cardboard for use on seed-beds and vegetable areas (Figure). Used correctly, cardboard placed on a specific area can do the following:

- Keep important fungal hyphae and microorganisms in the soil intact
- Prevent recurring weeds from popping up
- Increase residual nitrogen and plant nutrients by top-composting plant residues and
- Create valuable topsoil that is well suited for next year's seeds or transplants.

The plant residues (left over plant matter originating from cover crops, grass clippings, original plant life etc.) will rot while underneath the cardboard so long as it remains sufficiently moist. This rotting attracts worms and other beneficial microorganisms to the site of decomposition, and over a series of a few seasons (usually Spring-->Fall or Fall-->Spring) and up to a few years, will create a layer of rich topsoil. Plants can then be direct seeded into the soil come spring, or holes can be cut into the cardboard to allow for transplantation. Using this method in conjunction with other sustainable practices such as composting/vermicompost, cover crops and rotations are often considered beneficial to both land and those who take from it.

REVIEW VIDEOS:

No-till farming: Farm basics Till vs No Till: https://www.youtube.com/watch?v=bTtRp1_1Dq0

Lasagna Gardening How To – GardenFork: https://www.youtube.com/watch?v=nuNUTTFYArY

Procedure:

1. Work as partners or small teams.
2. Research and brainstorm the process of no-till farming using corrugated cardboard.
3. Build a no-till garden using corrugated cardboard and plant soybeans or Lima beans.
4. Provide the details in a Power Point presentation of the results of your no-till garden.

RUBRIC

4 World-Class Learner	3 Proficient Learner	2 Developing Learner	1 Emergent Learner
Learner at this level has gone beyond mastery of knowledge, skills, & attitudes described in project. World-class learner consistently exhibits high-quality performance.	**Learner at this level has had opportunities to apply knowledge, skills, & attitudes of component of project. Proficient learner has mastered essential attributes, thus proving mastery.**	**Learner at this level has been exposed to & had opportunity to apply knowledge, skills, & attitudes of project. Developing learner may have only a few essential attributes to master before mastery.**	**Learner at this level may or may not have been exposed to knowledge, skills, & attitudes required by academic standards of the project.**

1= Emergent Learner

2 = Developing Learner

3 = Proficient Learner

4 = World-Class Learner