South Dakota State University Extension

Cardboard in the Garden: Friend or Foe?

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Sheet mulching with cardboard

- No-till/no-dig method of site preparation that turns potential waste into soil.
  - Ruth Stout an early practitioner and advocate, Charles Dowding
- Layers of cardboard and organic matter
  - Compost, yard waste, straw, grass clippings, arborist wood chips
- Can create any type of garden: vegetable, perennial, food forest—just vary the depth of the mulch.
  - Deeper mulch layers for vegetables
  - Less mulch for native plants

https://courses.charlesdowding.co.uk/new-no-dig-allotments/

Why use sheet mulch with cardboard?

- If you have areas of poor soil—rocky, clay, compacted, etc.
- Create garden areas without disturbing the soil
- Suppresses weeds and builds soil
- Helps retain water
- Moderates soil temperature

No-till garden bed

No-till garden bed

Steps for no-till garden bed

1. Mow any grass or weeds in the space using the lowest setting.
2. Cover the entire area with overlapping pieces of brown, corrugated cardboard.
3. Add alternating layers of nitrogen and carbon. Each layer should be approximately 2” thick.
4. Wet the layers lightly with a hose or irrigation.
5. Allow the materials to decompose prior to planting, or else finish with a layer of soil if you want to seed or add transplants right away.

Nitrogen: compost, well-rotted manure, grass clippings
Carbon: dry leaves, sawdust, woodchips

No-till garden bed

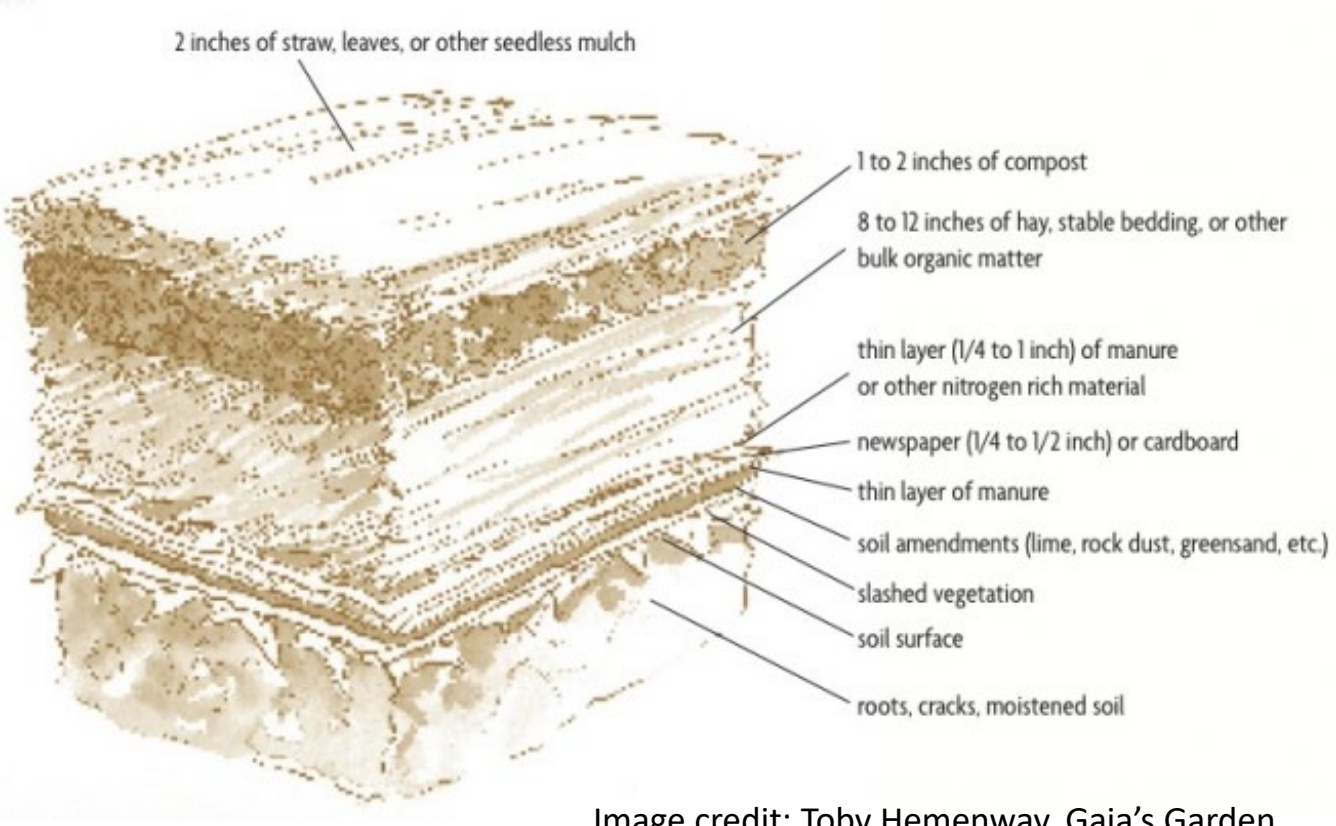


Image credit: Toby Hemenway, Gaia's Garden

Trees, shrubs, transplants

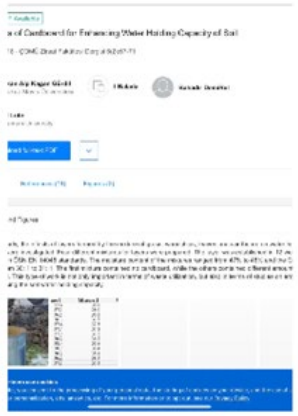
Trees, shrubs, transplants

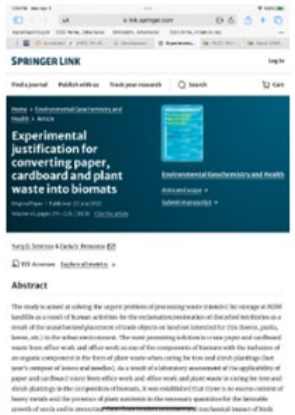
- Mow any grass or weeds
- Plant trees or shrubs prior to putting down cardboard
- Place cardboard and woodchips around trees or shrubs, or over top of the planting area
- Let cardboard decompose before planting additional plants

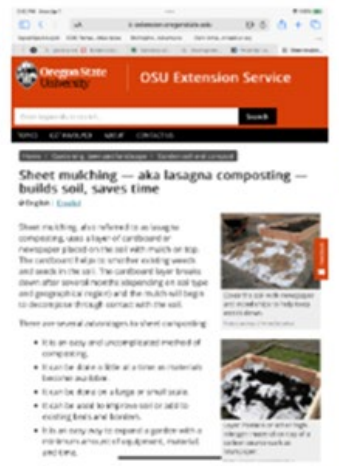
A recent study (in Poultry Science) and a popular garden blog (Garden Professors) have raised concerns about using cardboard in the garden.

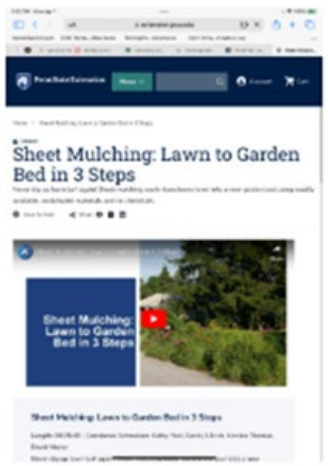
- Concerns include:
  - PFAS and other chemical contamination of cardboard
    - The types of cardboard used in litter, and the amount used for litter vs a thin layer on the soil are different than when using brown, corrugated cardboard
  - Reduced air exchange in soil covered with cardboard
    - But cardboard had better gas diffusion than landscape fabric or polyethylene mulch
    - Only tested cardboard in greenhouse, not full sheet mulch
    - Cardboard layer breaks down quickly in garden
- Important not to take results out of context

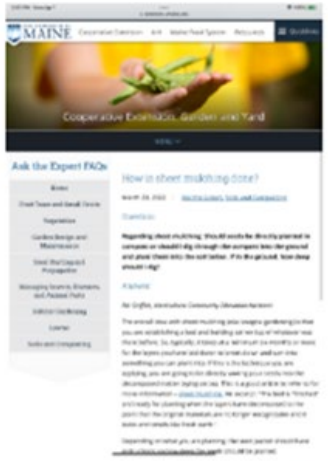
Research and Extension











Things to Consider when using Cardboard

Use corrugated, brown cardboard with minimal to no colored print

- Remove tape, staples

Full sheet mulching requires a lot of organic material

- Takes time to break down those materials (6-12 months)

If fewer layers are used weeds can still become an issue

- Thistle, creeping bellflower

Do not mulch up onto tree trunks or directly around plant stems

Not appropriate for all soil conditions, especially continuously moist or saturated poorly draining or clay soils—can create anaerobic conditions

Not every technique is appropriate for every area

Creeping bellflower in thin layer of cardboard and wood chips ☹

Sheet mulching with cardboard has been researched and advocated for by organic gardening organizations, universities, and gardening experts.

- Builds soil—especially if compact or clay
- Reduces weeding
- Conserves water
- Increases soil health-water holding capacity, organic matter
- Reduces waste
- Increases earthworm and mycorrhizal fungi—soil life

https://www.smilinggardener.com/organic-soil-management/sheet-mulching/

References

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- Potential contaminants and hazards in alternative chicken bedding materials and proposed guidance levels: a review. https://pmc.ncbi.nlm.nih.gov/articles/PMC7705057/
- Carbon dioxide and oxygen exchange at the soil-atmosphere boundary as affected by various mulch materials. https://www.sciencedirect.com/science/article/pii/S016719871930580X

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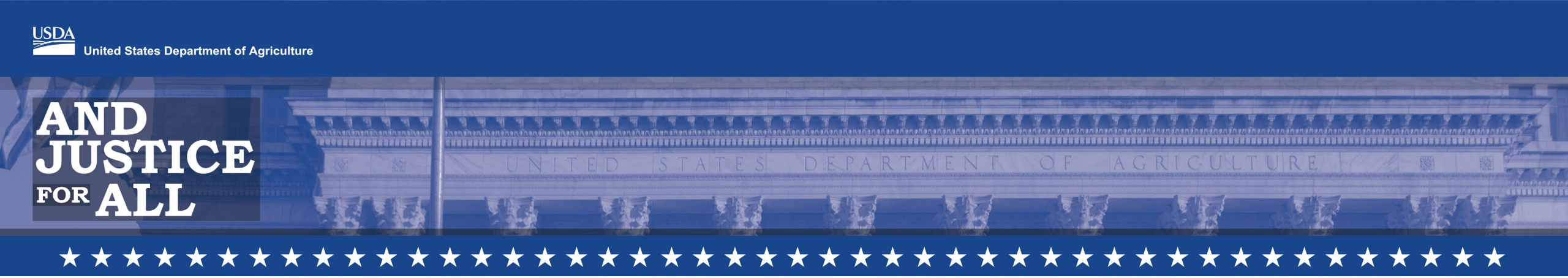

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