

## Bat Sheet Crazy: How sheet mulches damage soil and tree health

### An ideal landscape mulch will...

- 🍃 Enhance water infiltration and retention
- 🍃 Enhance gas transfer
- 🍃 Moderate soil temperatures
- 🍃 Reduce erosion and compaction
- 🍃 Improve soil structure
- 🍃 Provide mineral nutrients
- 🍃 Neutralize pollutants
- 🍃 Enhance beneficial microbes and insects
- 🍃 Suppress pathogens and pests
- 🍃 Be cheap, easy to find, and easy to apply
- 🍃 Not detract from aesthetics of landscape

### Unacceptable mulches

- 🍃 Synthetic mulches (geotextiles, plastic, rubber)
  - 🍃 Not a permanent solution to weed control
  - 🍃 Can damage health of landscape system
  - 🍃 Sheet mulches reduce water and gas transport
  - 🍃 Rubber mulches are flammable and may leach harmful chemicals
- 🍃 Organic sheet mulches (cardboard, newspaper)
  - 🍃 Can induce anaerobic conditions if used on wet, poorly drained soils
  - 🍃 Will become hydrophobic if allowed to dry out
  - 🍃 Can become pest havens for termites and rodents

### Acceptable mulches

- 🍃 Living: Cover crops, ground covers
- 🍃 Inorganic: Brick, decomposed granite, lava rock, stone pavers, tumbled glass
- 🍃 Organic: Coir, leaves, pine needles, straw, arborist wood chips (AWC)

### Arborist wood chips – the best choice

- 🍃 Generated through chipping trees or parts of trees; they are NOT bark mulches
- 🍃 Many benefits, including unique ones
  - 🍃 Provide a sustainable level of nutrient availability and prevent nutrient leaching
  - 🍃 Build soil organic matter slowly and sustainably
  - 🍃 Improve water and oxygen movement in soil
  - 🍃 Reduce evaporation
  - 🍃 Prevent soil erosion and compaction
  - 🍃 Enhance beneficial microbes, especially mycorrhizae
- 🍃 Ideal for weed control
  - 🍃 Decrease nitrogen levels at mulch-soil interface
  - 🍃 Reduce light needed by photodormant seeds
  - 🍃 Reduce light availability to buried leaves and root crowns of weeds

### Myths about arborist wood chips (AWC)

- 🍃 “Wood chips leach nitrogen from the soil”
  - 🍃 Wood chip mulches only affect nitrogen at the mulch-soil interface
  - 🍃 Wood chip mulches do not cause nitrogen deficiency in soil beneath interface
  - 🍃 High C:N ratio in wood chips prevents germination of weed seeds on interface
- 🍃 “Wood chips made from diseased wood will infect plants”

### ***Fungal pathogens and wood chips***

- 🍃 *Armillaria*, *Cytospora*, *Thyronectria* and *Verticillium* only survive on large pieces of wood
- 🍃 There is a possibility of disease transfer if wood chips are incorporated into soil
- 🍃 There is no evidence that pathogens in mulch can infect roots below the soil surface

### ***Fungal communities in wood chips***

- 🍃 Fungal species in wood chips are generally decomposers, not pathogens
- 🍃 In healthy (aerobic) soils, beneficial fungi out-compete pathogenic fungi
- 🍃 Healthy plants are not susceptible to opportunistic pathogens

### Landscape and garden mulching advice for gardeners

- 🍃 Do NOT place cardboard underneath AWC. No sheet mulches should ever be used
- 🍃 Begin AWC application before annual weeds are established (spring or fall)
- 🍃 Prune or mow perennial weeds at root crown; pulling destroys soil structure
- 🍃 Thick layers (6-8” for ornamental sites, 8-12” for restoration sites and aggressive weed control) of AWC are best for weed control and water conservation. Add more as needed to maintain 4” depth. (Mulch depth is critical – when depths are less than 3” then weeds increase)

### For more information

Dr. Linda Chalker-Scott

WSU Professor and Extension Horticulturist

URL: <http://www.theinformedgardener.com> (white papers on many of these myths)

Blog: <http://www.gardenprofessors.com>

Books: <http://www.sustainablelandscapesandgardens.com>

Facebook page: <http://www.facebook.com/TheGardenProfessors>

Facebook group: <https://www.facebook.com/groups/GardenProfessors/>

Publications: [https://www.researchgate.net/profile/Linda\\_Chalker-Scott/publications](https://www.researchgate.net/profile/Linda_Chalker-Scott/publications)