

What Are Swales and How to Create One

A *swale* is a shallow channel and a berm that collects rainwater and runoff from the land above it and any impermeable surfaces such as roofs, driveways and patios.

The water slowly infiltrates the soil below the channel. The channel is shallow 8-16" deep and 2-4' wide depending on the slope of the land and the average rainfall for the area.



A *bioswale* is a swale that is planted with ornamental or edible annuals, perennials, shrubs and trees to create a habitat and/or garden. A bioswale prevents water from running off a slope pooling in a low spot, eroding soil, and entering the sewer system. A bioswale also reduces the need for watering the area below the swale which results in a lower water bill.

How does a bioswale work? The bioswale consists of 1) a shallow channel and 2) a berm. The berm is located on the downward slope of the swale. Water flows into the channel and spreads out its entire length. Water is retained in the channel until it is absorbed by the soil below the swale. The channel is filled with mulch, 1) to keep soil from above the channel from entering and clogging the channel and 2) acting as a sponge to absorb any standing water over time. The berm prevents water from “sheeting” down the slope, which aids in the collection and percolation of water into the soil below the swale. Therefore, the soil retains moisture for longer periods of time.



Creating A Bioswale

1. **Determine the area for the bioswale.** Areas best for a swale have a gentle slope from 1-6%. Anything above 10% is too steep.

Bioswales should not be placed:

- Closer than 10' from buildings
- Above or near septic systems
- Above underground utilities
- Directly above bedrock or bedpan
- Low flat areas
- Any area with a highwater table

2. **Determine the water source(s) for the bioswale.**

Common water sources are:

- Roof downspouts
- Driveways
- Patios
- Sidewalks
- Sloped yards (preferably 1-6% slope)
- Street runoff.

Observe the water runoff to identify the natural water flow path. This is best done while raining and can be observed with a sprinkler left on for a period of time.

3. Mark the contour line for the bioswale

The tools needed:

- An A-Frame level, laser level or a carpenter's level with a stringline to mark points.
- Wooden stakes or landscape flags
- String line
- Spray paint
- Shovel
- Cardboard and/or newspaper

To mark the contour line, place wooden stakes or landscape flags every 3-5' of the contour line perpendicular to the slope. Then mark the swale center line, edges and width.

4. Excavating the channel.

Use the sod and soil that come out of the channel to create the berm. The berm can be narrower and taller or wider and shorter. Ensure that the berm is not so steep so the soil will fall back into the channel. The sides of the channel should be smooth. The channel bottom needs to be smooth and LEVEL with a "U" shape vs a sharp "V" shape.

Once the channel and berm are created, water the soil on the berm. Water will reduce any dust and compress the soil air pockets. Then lay cardboard or 6 layers of newspaper on top of the berm's soil. Water the cardboard/newspaper. The cardboard/newspaper will create a weed barrier as well as preventing soil from eroding. Mulch to the berm to prevent weed seeds from sprouting. The berm can be planted before or after the cardboard/newspaper is laid down.

5. Planting.

The top of the berm should be planted with drought tolerant plants as this zone is drier. The sides of the berm will have moderate to moist soil. Planting the berm helps stabilize the swale, preventing erosion over time. Please note that planting the channel is optional. To plant the channel, the plants must be suited to both wet and dry periods.

A berm, planted as a food garden, can be planted with herbs and other fruits and vegetables that prefer even moist soil. The top of the berm can be planted with berry bushes and/or trees. If planting trees, keep in mind that over time the amount of shade they provide will increase. The area below the berm can also be planted to create a larger garden. Leave a small path for you to harvest food and weed as needed.

6. Maintenance.

The first-year the plants need to be watered and weeded regularly until plants fill in the bare spots. During the second-year watering should be done for top of the berm plants, especially if trees and shrubs were planted. However, this should be only when it hasn't rained in 2-4 weeks depending on temperature. Signs of a healthy bioswale are 1) water infiltrates the soil within 24-48 hours, 2) dense plant growth, 3) minimal soil erosion and 4) the soil remains porous.

Each year ensure the channel has not become blocked. Refill the channel with mulch as it decomposes, normally every other year. The decomposed mulch can be used as compost in other gardens.

