



Make Your Garden More Climate-Resilient: Lawns

Earth's current warming trend results in melting glaciers, rising sea level, increasing ocean acidity, and more frequent and severe droughts and floods. The Pacific Northwest has seen prolonged drought, increasing wildfire incidence and severity, heat waves, insect outbreaks, and tree diseases. Reduced snowpack results in earlier peak flows in rivers and streams which reduces water supplies. In addition to these trends, climate change brings erratic, extreme weather events (heat wave, heavy rain) in greater frequency. <https://blogs.oregonstate.edu/occri/oregon-climate-assessments/>

How do we garden in these times? This handout offers ideas for building resiliency into the garden via plant choices and growing practices.

What We Know

- Climate change is occurring because an excessive amount of the gas carbon dioxide (CO₂) is accumulating in the atmosphere. All green plants have the potential to capture carbon from the atmosphere through photosynthesis.
- A lawn's long growing season means a greater potential for pulling carbon from the air into the grass blades and root system.
- Bare soil and impervious surfaces (like asphalt and concrete) increase temperatures in comparison to surfaces covered in plants. Turfgrass is 4°C cooler than urban surfaces not covered with turf and as much as 39°C cooler than synthetic turf on a hot day.
- Oregon State University's Turf Management Program researchers are studying how to make your lawn more climate-friendly. Lawns take in carbon from the air and temporarily store it in the grass blades and the roots. But some of that carbon is moved back into the atmosphere by soil microorganisms that break down roots and thatch. For details, read Climate-Friendly Lawns <https://extension.oregonstate.edu/gardening/lawn/through-thoughtful-practices-lawns-can-be-climate-friendly>

Potential Climate Mitigation

- Studies show that mowing, fertilizing and irrigating can boost photosynthesis and increase the amount of carbon moving into the grass plants and soil.
- Some cultural practices encourage soil microbes to break down organic matter which releases carbon back into the atmosphere.

What To Do

Mow at an optimum height: Lawns managed at a higher mowing height have greater shoot biomass. However, a lower mowing height produces greater lawn density by stimulating lateral growth. OSU research suggests that a 2-inch or higher mowing height is optimum for lawn health, broadleaf weed prevention and carbon sequestration. Mowing lower than 2 inches will open the opportunity for weeds to move in. Mowing at 4 inches gives maximum carbon sequestration and weed prevention.

Skip the emissions: Switch to electric-powered mowers, edgers, string trimmers, blowers and other equipment. Manual reel mowers are another lower-cost option that only use human power.

Keep grass clippings in place: Skip the bag or use a mulching mower to return grass clippings to the lawn. Use a rake to separate any large clumps of clippings to avoid smothering the lawn. This recycles nutrients into the lawn and reduces fertilizer needs. Research shows that bagging and removing grass clippings will remove around half the nitrogen applied in a year.

Apply fertilizer thoughtfully: Annual fertilization rates should be 2 to 4 lb of nitrogen (N) per 1,000 square ft. To reduce your carbon footprint, use organic fertilizers for two applications per year, once in the spring and once in the fall, at 1 to 2 lb of N per 1,000 square ft for each application. If you choose synthetic fertilizer, pick a product that is slow release and with a low concentration of phosphorus, such as a 10:1 nitrogen to phosphorus ratio.

Build the soil: Adding compost can help build the soil. Spread a one-quarter-inch layer over an existing lawn in the spring or fall and rake in. The quarter-inch compost layer will provide approximately 2 lb of N per 1,000 square ft. Therefore, two applications at this rate would provide 4 lb N per 1,000 square ft annually.

Add clover to your lawn: Clover and other legumes can capture nitrogen from the atmosphere. Add these elements to create an “eco-lawn” and bypass carbon emissions produced during fertilizer manufacturing and delivery.

Use water wisely: Recent research in western Oregon has shown that around one-quarter inch applied four times per week, totaling one inch per week, will result in a greener, healthier lawn with fewer weeds than a lawn that receives one inch applied in a single application. Reducing the amount of irrigation water will also decrease the microbial activity of the soil and reduce carbon emissions.

Let it go brown: If you can tolerate a brown lawn in the summer, let it go dormant by not watering. Keep in mind that unirrigated lawns are more susceptible to broadleaf weed invasion and will require some maintenance in the fall. Dormant lawns are also generally carbon-neutral. The lawn isn’t growing and taking in carbon, but the soil microbes also aren’t active and releasing carbon.

Replace your water-hungry lawn: Tall fescue is generally a drought-tolerant, cool-season grass that can retain some green color during summertime without irrigation. OSU research in the Willamette Valley has shown that one-half inch per week is adequate for tall fescue while one inch per week is required for perennial ryegrass. In eastern and central Oregon, tall fescue will require more irrigation (roughly one inch per week).

Common yarrow (*Achillea millefolium*) is a typical component used in Oregon eco-lawn plantings. A mixed planting of common yarrow and grass will keep the lawns looking green longer into the summer months without any irrigation. If monthly irrigation is applied (one-half to one inch once a month), the lawn may stay green all summer. Common yarrow and other eco-lawn seeds can be purchased from specialty seed companies online. Eco-lawns can be planted by overseeding into an existing lawn or during a complete renovation.

Other low-growing, non-grass ground covers include creeping thyme, creeping mint, low-growing chamomile or even moss. Match the ground cover to the amount of sunlight and moisture the site receives

Build your tolerance of weeds: Weeds can even help increase biodiversity in your yard by providing food sources for different insects. Flowering weeds can provide support for pollinators.

Use herbicides wisely, if at all: Mow before the weed seed sets to avoid spread or use physical removal for weed management. If a chemical herbicide is warranted, choose a low-impact product from the list <https://blogs.oregonstate.edu/schoolipm/pesticides/>

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