

Field Guide for Rain Garden Care

**A GUIDE FOR BACKYARD, NEIGHBORHOOD,
AND COMMERCIAL RAIN GARDENS**

Special thanks to the Arizona State Forestry Division and WMG donors for funding this guide. This guide is generally useful for all rain gardens, with specific examples from the Sonoran Desert in the southwest U.S. and northwest Mexico.

Conventional Landscaping

Say NO to Mow, Blow, & Go!



Grass is a water hog and is maintained with loud mowers and chemical fertilizers.



Leaf blowers are a public nuisance—they cause air and noise pollution. And they blow vital organic material off the landscape!



Chemical weed killer is sprayed frequently on public landscapes (often seen as blue/green coloring). These chemicals are harmful to our soil, water, and wildlife.

Say YES To Hoe, Flow, & Grow!



Hand tools are the best way to remove weeds. You can be selective about what weeds you pull, and there is no noise or chemical pollution!



Plan your landscape to let the water flow through your yard and soak into the soil.



Let your plants grow and prune minimally. You'll be pleased with the results—healthier plants, unique shapes, and better wildlife habitat.

vs. Rain Garden Landscaping Care

Save Dough with Hoe, Flow, & Grow

You can be lazy and save money! Our rain garden care regime helps you avoid trips to the store. Here are things you won't have to pay for:

- Weed killers • Compost • Fertilizer • Hauling away yard trimmings • City water for irrigating plants

You can reduce costs even more by choosing not to install drip irrigation systems and timers—instead, water by hand to establish your new plants.

If you hire a landscape crew for routine maintenance, they can reduce their number of visits and tasks. Here's what you can tell them:

- No raking, please!
- Keep pruning to a minimum—only prune trees and shrubs if they interfere with human pathways.
- Weed less by using more organic mulch.
- Don't spray chemical herbicides—hand pull weeds when they pop up.

“Most Wanted” Landscape Chemicals

Here are some of the most common conventional pesticides used in gardens and landscapes. Let's outlaw these chemicals from our rain gardens and landscapes!

Chemical Name	Type	Common Brands/Usage	Human & Environment Impacts
2,4-D	Herbicide	Agent Orange	1,2,3,4,5
Glyphosate	Herbicide	Round-up	1,3
Carbaryl	Insecticide	Sevin	1,3,4,5
Mecoprop	Herbicide	Weed-feed fertilizers	1,3
Pendimethalin	Herbicide	Prowl, Herbadox, Stomp	1,3,5
Pyrethroids	Insecticide	Permethrin	1,3,4,5
Malathion	Insecticide	Spectracide: broad use, mosquito	1,2,3,4,5
Dicamba	Herbicide	Banvel, Diablo, Oracle and Vanquish	1,2,3
Trifluralin	Herbicide	Triflurex	1,3,5

1. Can contaminate surface waters and/or groundwater
2. Toxic to Birds
3. Toxic to Fish/Aquatic Organisms
4. Toxic to Bees
5. Endocrine disrupter

Sources:

- http://www.epa.gov/opp00001/pestsales/07pestsales/market_estimates2007.pdf
- <http://www.pesticide.org/get-the-facts/pesticide-factsheets>
- <http://www.beyondpesticides.org/lawn/factsheets/30enviro.pdf>



Rain Garden Care:

Instead of MOW, Blow, and Go... we say, HOE, Flow, and Grow!

Before you mow, whack, or wage chemical warfare on the “weeds” in your yard, we invite you to think differently. Be selective. Reduce the number of plants you pull by using a hoe to remove specific weeds instead of removing all your seasonal and annual plants.

So What is a Weed?

In general, weeds are undesirable plants that you don’t want in your rain garden. In many cases, plants considered to be “weeds” are actually beneficial. WMG defines weeds more specifically as plants that are invasive or aggressive and will out-compete your desirable plants. Many of these invasive plants are not native and will be the highest priority for removal.

Some examples of non-native weeds in the Sonoran Desert Region include: Bufflegrass, Bermuda grass, Fountain grass, London Rocket, and tumbleweed. Check out our plant guide on pages 12 – 15.

Our favorite examples of turning weeds into a prize are native annuals that you can eat! These plants are often packed with healthy nutrients. Have you heard of purslane, also known as verdologas? It pops up freely in southwest yards during the monsoon season. What’s referred to as pigweed is actually amaranth. Ooh, how exotic! You can quickly harvest, chop, and toss both these plants into your salad, stir-fry, or green smoothie. Dandelions, goldenrod, common mallow, prickly pear—they’re all edible! Check out an extensive photo log of more wild edibles at ediblewildfood.com.

Remember: When in doubt, don’t pull it out!

Google it or ask a plant expert. Make sure you find someone particularly knowledgeable about native plants—not every green thumb knows what is native to the bioregion.

Beyond wild edibles, there are many other benefits of seasonal and annual plants, such as:

- Adding nutrients to soil and building organic matter
- Attracting birds, bees, and other pollinators
- Protecting soil from erosion

Hoe



How To Remove Weeds

If you are proactive, you can easily remove most weeds following these steps:

1. Remove weeds when they are small and after rain. Weeds are easiest to pull when roots haven't grown too deep yet and the soil is soft.
2. Pull or dig out the entire plant including the root system. A trowel, hoe, or shovel should be sufficient to do the job. If you just cut off the top, the plant will likely continue to re-sprout from the base.
3. Remove weeds before they set seed! This will reduce future spreading.
4. Have someone else do the work! Weeds can also be kept in check by animals that graze, such as chickens or goats. Create a "chicken tractor"—a moveable structure where chickens hang out for the day and eat your weeds.

But I Want My Yard to Look Good!

Taking a more free-spirited approach to weeds will change the way your yard looks. Here are some tips to make it work for you:

1. Embrace your wild side. Have different zones in your yard with different levels of maintenance. Allow some areas of your yard to have a wilder look, where you are encouraging wildlife habitat. And keep a cleaner look in other areas where you remove most/all annual and seasonal plants.
2. Trim back weeds from pathways and patios to keep a clean edge.
3. Use organic mulch to reduce weed growth. A 3 – 4 inch layer of wood chips will keep many weeds—and dust—at bay.

Rain Garden Care:

Rain gardens are planted basins designed to harvest rainwater and stormwater, so managing the flow is essential. The best way to do this is get out in the rain and see the flow in action.



What problems should I look for?

1. Is water backing up or not making it to your basins and tanks? Look for leaking gutters, clogged curb cuts, or clogged pipes.
2. Do you have enough capacity to capture all the rain you want? Look for water running off or overflowing—plan where to add more tanks or basins in the future.
3. Are your overflows and outlets working like they should? Look for water overflowing near your foundation or erosive features forming.
4. Is there standing water for more than a few hours after a storm? If you have standing water 24 hours after the storm, read on for some strategies to address poor infiltration.

Do I need more rain storage capacity?

If you find most rainwater overflows in a typical storm (0.5" to 1" rainfall), your tanks and basins aren't large enough. The least expensive way to increase capacity is to make your basins bigger. You can widen and deepen existing basins or add more.

You can also increase the capacity of your tanks—we suggest sizing your tank to capture a full rainy season or at least several large storms. With climate change, storms are larger, but less frequent, so you'll need to be prepared to capture these few big events.

I have standing water. What should I do?

If water is standing in your basins for more than 24 hours, here are some steps to increase infiltration:

- Make sure you have at least 2 inches of organic mulch in basins.
- Plant more!—the roots of grasses and shrubs that can be inundated in water will improve your soil and help infiltrate water.
- If you have caliche (a hard clay layer common in the desert), you may need to use a digging bar or pick to punch through the caliche in some areas.
- Make your basins wider. Spreading the water over a larger area will help it soak in.
- Build in mulched vertical infiltration drains (holes 1 – 2 ft wide and 2 – 4 ft deep) to move water more quickly down into the soil.



Mulch may float when basins fill with water. Plants and rock features can help keep mulch in place, but if your mulch is consistently washed away in rain storms, use larger rocks as mulch.

Flow

Setting Up Your Plants For Survival

Remember, a rain garden doesn't work without plants—they are essential to turning your soil into a "sponge". The plants' root systems create pathways for water to infiltrate into the soil and reduce standing water in basins.

Right: Water flows through a spillway, a rock armored overflow between two basins. It's important to check spillways during storms to ensure they are working properly and water isn't overflowing in undesired places.



Here is a general watering guide to make sure your plants survive and grow into a healthy part of the rain garden.

1st Year: Baby them now for stronger plants later.

- Water deeply right after you plant, and every 1 – 2 days for the first two weeks
- Water two times a week during the summer
- Water one time a week during the winter

2nd Year: Start to wean your plants off additional irrigation.

- Water one time a week during the summer
- Water 1 – 2 times a month during the winter

3rd Year and beyond

- Water during dry summer months or during times of drought

**If you receive rainfall, then you can skip your extra watering cycle! Remember plants native to your bioregion can thrive off natural rain cycles. By harvesting rainwater and stormwater, you are actually increasing the amount of water a plant will receive in a rain event and storing extra moisture in the soil. Once plants are established this is all they should need.



Rain Garden Care:



This Palo Verde has been left with a more natural shape—branches are left to hang low—providing great wildlife habitat and stability for the tree.

Let plants grow—instead of constantly pruning, raking soil, and spraying herbicides. Prune only to promote the health of the tree, keep branches clear of walkways, and shape the canopy for better shade.

Patience, Don't Prune Yet!

Wait at least one year, and up to two years, before you prune trees after planting. Trees become stressed when they are transplanted, and they need ample time to adjust to the new soil, moisture, and light conditions. By not pruning, you allow the tree to develop a more natural shape and strengthen as it grows.

Plants will be healthier and stronger if they are allowed to keep their natural shape. When laying out the plants in your rain garden, plan for the mature size of shrubs and trees. This will ensure plants don't need to be constantly pruned to prevent crowding.

Chop and Drop

The trimmings of your trees and shrubs are valuable to build nutrients in the soil. If you have basins with organic mulch or mulch covering your landscape, you can chop and drop the prunings from your tree.

Prune branches, then chop them into pieces 3 – 6 inches long and drop them in your basin. For larger branches, use them around your landscape as habitat. Drill holes 1/8 – 3/8 inch in diameter and 3 to 8 inches deep to provide bee nesting habitat.

If you have a larger property with more trees, rent, purchase, or hire a commercial chipper to create mulch from your prunings.

Nurturing the Urban Forest and Planting for the Future

In a rural or wild setting, forests have a natural succession—young trees grow and fill in when old trees die. We often don't allow succession in urban settings because we pull up seedlings. But succession is just as crucial in urban settings to build our shade and habitat corridors. So don't wait until a tree dies or is knocked over in a storm to plant a new one!



Grow

When branches or trees fall, keep them on your property to serve as habitat—great for a variety of insects, including bees, and for lizards and frogs. If the tree is too big to keep, just cut a few large branches and place in basins or the 'wild' areas of your yard.



Continue to plant trees every 1 – 5 years, so as trees die, fall down, or become diseased, younger trees can fill their place. The older trees will serve as nurse trees, providing a more favorable environment for young trees. Variety is the spice of life—your tree succession will be more successful if you plant a variety of species. Diversity protects against loss due to pests or disease.

The Average Lifespan of an Urban Street Tree is 15 – 30 Years!

Consider the lifespan of the trees in your rain garden. How long are they likely to live? In an urban setting, there are many stresses that may shorten the life of your tree. Following the practices in this guide will reduce those stresses, but it is still best to plant new trees regularly. Below is a list of recommended trees with their lifespans in wild settings. Take this information with a grain of salt—it is very difficult to determine average lifespans of trees.

Sonoran Desert Tree Lifespans

Desert Willow (*Chilopsis linearis*): up to 30 years

Blue Palo Verde (*Parkinsonia florida*): 60 years, usually under 100 years

Catclaw Acacia (*Acacia greggii*): 100+ years

Canyon Hackberry (*Celtis laevigata*): up to 150 years

Velvet Mesquite (*Prosopis velutina*): up to 300 years

Foothills Palo Verde (*Parkinsonia microphylla*): 100+ years, up to 400 years

Emory Oak (*Quercus emoryi*): hundreds of years

Desert Ironwood (*Olneya tesota*): 300 or more years

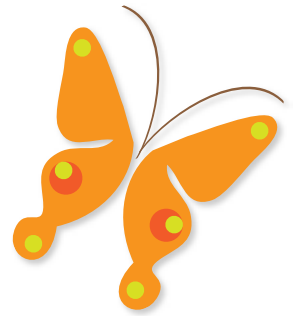


The Good, the Bad, and Your Sonoran Desert Rain Garden Weed Guide

THE GOOD

Let these native plants thrive and you will have a colorful, sensuous yard!

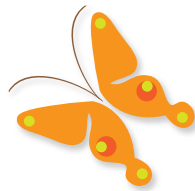
These plants will pop up with seasonal rains and often dry up or go dormant at the end of the rainy season.



Arizona Caltrop, *Kallstroemia grandiflora*
(Note: looks similar to goats head, so ID carefully)



Bladdermallow, *Herissantia crispata*



Desert Senna, *Senna covesii*



Desert Bluebells, *Phacelia campanularia*

the Scrappy



THE GOOD



Dogweed, *Thymophylla pentachaeta*



Globe Mallow, *Sphaeralcea emoryi*



Slender Goldenweed, *Xanthisma gracile*



Parry Penstemon, *Penstemon parryi*



Ivyleaf Morning Glory, *Ipomoea hederacea*
(Note: this vine grows aggressively with extra rain, so you may need to trim it back or remove from plants)

Special thanks to Monsoon Squad members, lylea Olson and Jill Lorenzini, for helping develop this guide through contributing photos and sharing their plant expertise.

THE BAD

Don't let these villains invade your rain garden!

It's best to remove the whole plant and remove them before they seed to reduce spreading.



Buffel grass, *Cenchrus ciliaris* (Note: This plant is a fire hazard. Make sure you carefully identify buffel grass. Don't make the mistake of removing native bunch grasses, which look similar to buffel grass, and are often used in rain gardens. Learn more at buffelgrass.org.)



Bermuda grass, *Cynodon dactylon* (Note: Tricky to remove. You will need to be diligent to remove Bermuda grass manually. Dig out full root system—up to 1.5 ft deep.)



Fountain Grass, *Pennisetum setaceum*



African Sumac, *Rhus lancea* (Note: This tree spreads prolifically.)



London Rocket, *Sisymbrium irio* (a mustard)



Goat head, *Tribulus terrestris* (Note: This is native but is a nuisance in human use areas. Be proactive and pull these before seeds form. They are sharp!)



Hyssop leaf Broomspurge, *Euphorbia hyssopifolia*



THE SCRAPPY

Keep these native plants, if you like it wild!

These plants are great for wildlife habitat, so let loose and let them do their thing.



Scarlet Spiderling, *Boerhavia coccinea*



Desert Broom, *Baccharis sarothroides*



Amaranth or Pigsweed, *Amaranthus palmeri*
(Note: leaves and seeds edible)



Common Mallow, *Malva neglecta*



Purslane or Verdologoas, *Trianthema portulacastrum*
(Note: This plant is edible and great for salads, smoothies, and stir-fry.)



Woolly Honeysweet, *Tidestromia lanuginosa*

Common Rain Garden

Here are some common rain garden problems. These issues can turn a rain garden into an unsightly rain disaster. You can prevent these problems by addressing them in the design phase and monitoring your rain garden frequently, especially during storms.



Don't over prune your trees—they are both unsightly and nonfunctional. Make sure trees are pruned by arborists or pruned by people who have been properly trained.

Street-side basins are prone to filling with sediment. Build-in sediment traps so the sediment is contained and easily removed—instead of filling in the whole basin.



Berms can fail if they are not level or don't have an armored spillway. Make sure your 'outlets' are lower than the top of the berm. Water will find a way out, so plan for this. Eye-balling grades and levels is not sufficient—you will need to use a water level or laser level. Be proactive in planning your overflow so you can direct it where it is most useful.

Problems

Bermuda grass, an invasive weed, has choked these rain gardens. The grass is blocking the inflow to the basin, preventing water from entering and choking out the native plants. These basins become extremely difficult to weed and maintain. To prevent this common problem, make sure Bermuda grass is entirely removed before you plant your rain garden. Stay on top of the problem with frequent weeding to remove new grass as it pops up.



The best time to spot leaks is during a storm. A tank should never leak water through its lid or inflow pipes. Also check for gutter leaks. Make sure inflow and overflow pipes are property sized, and make sure pipes and screens are not blocked by leaves and other debris.

Rain Garden Care Cheat Sheet

Rain Garden Care

Monthly

- Inspect spillways, inlets, and outlets for blockages.
- Observe plant growth, adjust watering/irrigation as needed.

Seasonal – Before, During, and After Rainy Season

- Inspect berms for signs of erosion. Level berm tops and reinforce or armor berms as needed to mitigate erosion and prevent breaches or failure.
- Inspect subsurface piping for blockages or sedimentation. Remove any obstructions and periodically flush piping to remove accumulated sediment or debris.
- Add yard trimmings and other green waste to basin bottoms to replenish mulch with on-site materials. Exception: undesirable weeds that have set seed should be disposed of off-site.
- Check basins and swales after rainfall for excessive ponding. Incorporate organic mulch, deep rooted plants, or deep infiltration trenches if needed.
- Prune trees minimally, just one or two times a year.

Green Infrastructure Care (stormwater harvesting)

Monthly:

- Remove invasive plants and weeds, particularly Buffel Grass and Bermuda Grass which, left unchecked, can render green infrastructure ineffective.
- Clean up any trash that may have blown into your basins.

Seasonal (Before and During Rainy Seasons)

- Inspect inlets and outlets for blockage.
- Remove sediment from basin inlets and sediment traps.
- Inspect berms, basin slopes, and spillways for signs of erosion. Reinforce or armor earthworks as necessary to mitigate erosion.
- Add plant trimmings and other yard waste to basin bottoms to replenish mulch with on-site materials. Exception: undesirable weeds that have set seed should be disposed of off-site!
- Check basins and swales after rainfall for excessive ponding. Incorporate organic mulch, deep rooted plantings, or deep infiltration trenches if needed.
- Prune trees and plants minimally to ensure plants do not obstruct pathways or required traffic visibility at intersections.

Rain Tank Care

Monthly

- Check tanks and plumbing lines for leaks or wet areas.
- Clear the gutters and downspout of any debris, leaf litter, etc.
- Check to be sure adult mosquitoes do not have access to the stored water in the tank.
- Ensure pump and irrigation system are functioning and perform maintenance as recommended by the manufacturer.

Seasonal (Before and During Rainy Seasons)

- Check and clear debris from gutters and downspout.
- Check that gutters, debris filter (if installed), and downspout pipes are well secured.
- Check overflow outlet and clear out any debris.