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Start with You

Floods and other natural disasters can be traumatizing events. We may feel helpless, distraught, sad, angry, and scared as homes and our communities are upended by forces beyond our control. As gardeners, we often seek refuge in our gardens—for many of us, gardens not only feed our bodies but also provide us with a place of calm and serenity where we can retreat when we are stressed. So, the loss of our gardens to floods can be exceedingly distressing on many levels. Therefore, during these difficult times, it is even more important for you to take care of yourself, not only to attend to your physical safety but also to your mental and emotional health. Ask for help when you need it, be sure to take breaks, and remember to breathe.

Suit Up for Safety

Clean-up efforts should always start with the right “personal protective gear”. Avoid direct contact with flood waters as much as possible. Floodwaters likely contain debris and contaminants like household and hazardous waste and chemicals, as well as disease-causing organisms from septic systems and manure pits.

When dealing with mud and silt from floodwaters, be sure to wear rubber boots and gloves. Eye protection and N95 masks are also recommended for protection from fine particles that may be kicked up during the cleaning process.

Be sure to wash your hands and any exposed skin immediately after clean-up efforts. It’s best to keep boots at the door, clean and sanitize them and any tools you use during clean-up (you can use a solution of 1 cup bleach and 5 gallons of water), and wash clothing in hot water after working in a flooded garden.

Attend to Your Soils

Whenever you have saturated soils in your gardens or lawns, there is an increased potential for compaction. If you have standing water, try to create ditches or furrows to redirect water from your plants and drain the area. As much as possible, avoid walking or driving on waterlogged soils to stem further compaction and prevent additional root damage. Compacted soils can be aerated but you need to wait until they are dry or more damage is likely.

The key is to let soils dry out before you start working them to help maintain good soil structure. For most soil types, soil is dry enough to work when it forms a ball in the hand, then crumbles when pressed. If the squeezed ball of soil drips water, it’s still too wet. Once dry, you can consider tilling if needed or aerating soil with a garden fork inserted straight down into the soil about six inches deep about every 12 inches to the affected area.

Because floodwaters leave contaminated silts and mud behind, it is a good idea to test garden soils for possible contaminants. The UVM Extension Agricultural and Environmental Testing Lab provides screening for heavy metals for a modest fee. See go.uvm.edu/soiltest for the lab's testing form and guidance on interpreting test results for heavy metals. The [Extension Master Gardener Helpline](#) can offer ideas about how to proceed if high levels are found. You may also want to conduct a standard soil test to see what nutrients may have washed away and need replacing. Results will reveal nutrient levels and if soil pH needs adjusting.

Flooded Vegetable Gardens

Simply put, if your vegetable gardens are flooded from *rain* water, they are fine to harvest; plants may bounce back if they are in well-drained soil. However, if vegetable plants have come into contact with *flood* waters, they will need to be destroyed and nothing should be harvested. Unfortunately, vegetable and berry crops that have been in or touched by flood waters are considered adulterated and should be discarded or tilled in. As gardeners, we want to avoid food-borne illnesses (especially among vulnerable populations like kids and elders) that can come from exposure to flood waters and so this is an absolute must. Out of an abundance of caution, discarded plants should not be added to your compost pile to avoid the spread of contaminants; instead bury or landfill them.

The safest practice for floodwater-contaminated vegetable gardens is to till in the plants to a depth of at least six inches, adding in compost to increase tilth and dilute contaminants, and then plant cover crops to speed the decline of pathogens before planting vegetables in the garden the next season. Since soil saturated with floodwater is a possible source of human pathogens and parasites, to minimize the risks of exposure to contamination, you should not replant into affected garden soils for at least 30 to 60 days (gardeners must make their own determinations of risks).

If you are growing vegetables in raised beds and floodwater did not come into contact with the plants and had no floodwater splashed up on them, they are likely safe to harvest. Exceptions include root crops like potatoes and carrots where floodwater may have permeated the bed from the ground up and crops that lie on the soil surface (like strawberries, melons and leafy greens). In both cases, the crops should be discarded.

For brambles and blueberries, you can use a hose to wash silt away from the root areas of these berry plants. Again, if fruits have touched floodwater, they should not be eaten. However, you can harvest them if the fruit did not touch flood water or get floodwater splashed on them.

Please note that cooking does not eliminate the risk posed by industrial pollutants. Neither should you attempt to make an unsafe, flooded garden produce safe by using chlorine bleach, etc.

Ornamental Gardens

Ornamental gardens that have been flooded may recover fully depending on the type of plants and the length they were standing in water—the longer they were in standing water, the more depletion of oxygen in the soil and time for roots to rot. Plants that can tolerate “wet feet” like ferns, sedges, mints, willows, maple, river birch, and other plants that can endure wet conditions will likely survive with little damage. Plants sensitive to wet conditions (sedum, crabapples, pines and oaks to name a few) and tender herbaceous plants may see significant decline or death.

For ornamentals, it's best to take a wait-and-see approach. Go ahead and remove any trash or debris from the gardens and let soils dry. You will want to watch for invasives, like Japanese knotweed, that may have washed in and discard (do not compost) them. Wash silt from ornamental leaves and stems if needed.

For annual flower beds, remove as much silt as possible. Due to their limited reserves, damage to annuals will be evident within about two weeks. Since waterlogged soils impede oxygen needed for root growth, a waterlogged plant will often wilt since its roots are not able to grow. Wet soils also make good conditions for root diseases to appear. If the annual beds don't recover, go ahead and till them under, adding compost and a cover crop (consider buckwheat in the summer and oats or winter rye in the fall) to condition the soil for next year.

Many perennials, especially native and well-adapted plants, are tough and will likely rebound. The exceptions are shallow-rooted plants like yarrow and tickseed and groundcovers such as dead-nettle and sedum that are not likely to survive being silted.

Although many perennials will emerge through a few inches of silt, it will help them recover by raking over them to remove some silt and keep it from crusting. As with lawns and other beds, make sure to test the soil fertility. If plants are covered with more than a few inches of silt, try to remove as much as possible by early spring before the plants start to emerge and grow. For deeply silted perennial beds, it may be easiest to dig up your choice plants, till the whole bed and start over. You may want to replant on higher ground, in raised beds, or in refurbished soil. The upside is this may be a chance for a new bed design and to introduce some new plants to your garden.

Many trees are able to withstand up to a week of flooding with little resulting damage. Unfortunately, trees may take several years to show flood damage symptoms, and then it is too late to save them. If you have a special tree, consult with an arborist to see if corrective measures are needed now.

For both trees and shrubs, scoop or rake away silt deposits from the base of plants and tree trunks. Silt and mud can smother shrubs and trees. For example, silt deposits of 3 inches or more over the roots and 6 inches deep around trunks can be injurious to trees. Water and air need to reach tree roots, and since many of their feeder roots are near the surface, it is important to break up or remove silt to slow plant decline and eventual death. Do not till under trees as this will damage their surface roots.

Silt removed from your gardens can be brought to a landfill, used to fill in eroded spots on your property, and even made into berms to start new ornamental (not vegetable) beds.

Lawns

Lawn survival will depend on the amount of silt and mud left by floodwaters and amount of time turf grasses were under water. Due to the lack of oxygen and light, significant losses to turf grasses are expected after 4 days of being underwater (whether the water is from rain or flooding). Waterlogged lawns from rains or flooding should be left to dry out; again if you can make furrows to drain standing water, recovery may increase. You can also consider using a push-behind or step-on lawn aerator if soils are not draining well.

If your lawn is covered with less than an inch of silt from flooding, it may recover. Scratch the surface with a steel-toothed rake or similar tool. Once silt is broken up, you can try washing silt from small areas of the lawn, or at least thinning the depth, with a forceful garden hose. If the silt dries and crusts, keep it broken up during the season until the grass re-establishes.

If your lawn is covered with more than an inch of silt, it may not recover and will likely need to be re-established from scratch. Remove as much silt as possible, especially if silt deposits exceed 3 inches. If the silt is over 3 inches deep, consider having it professionally removed unless you have a tractor and attachment to scrape it off. If silt is less than 3 inches or has been removed to this depth, till the area, making sure silt is mixed thoroughly with the top 4 to 6 inches of original soil. Re-

seed or re-plant the areas as you would to establish a new lawn in late summer and early fall when cool-season grasses thrive.

If the silt deposits are under three inches, you can also try renting an aerator to use up to 6 times through the season. This equipment removes small cores of soil and silt, allowing air and water to get to the roots. If you do this on a smaller area, you can topdress with compost which will work into these holes.

Continue to monitor the lawn and if it does not show signs of growth by late spring, you should consider rototilling it to incorporate the silt as if adding a layer of topsoil. A soil test will reveal what nutrients, if any, need to be added before reseeding. If you have a small area or want instant results and have the budget, consider adding strips of sod. Do not sod over dead or buried vegetation. The dead layer of grass must be tilled in before laying new sod. If laying sod is not possible, keep in mind that the best times for seeding cool-season grasses are early spring and late summer when conditions favor them and not the weeds. If this is the case, you can stabilize the soil by seeding annual ryegrass at 4 to 6 pounds per 1000 square feet. Then till this in late summer before seeding the permanent grasses.

Another option would be to spend the remainder of the year rebuilding the soil, removing as much silt as possible first and tilling the ground. Since the silt likely brought in a load of weed seeds, you use clear plastic to “solarize” the soil. Here, you are basically covering the soil with a mini-greenhouse that heats up, killing some diseases and many weed seeds. To solarize, rake the soil, moisten it with the hose if dry (moist soil holds more heat), then cover the area with a thick sheet of clear plastic. Hold the edges down with boards, stones, or just bury them in a shallow trench. Leave it on for 6 to 8 weeks. The soil can be tilled again, bringing more seeds to the surface, and covered again. Or, after the first covering, seed in a cover crop to protect the soil from erosion and stimulate biological activity. In the fall, consider planting small grains such as oats or winter rye with or without hairy vetch for adding nitrogen or seed your lawn with cool-season grass

If you have eroded areas, you can refill and replace the topsoil. If this is too expensive, amend any added backfill with organic matter such as compost, rotted wood chips or old mulch, etc. If the area isn't destined to be a lawn, you can add plantings (perennials or shrubs) and mulch, seed with annual rye, or add a cover crop such as clover.

Questions?

If you have questions, contact the UVM Extension Master Gardener Helpline at go.uvm.edu/gardeninghelp. We are open 24/7/365 for online questions (where you can submit photos of affected plants) and on Thursday mornings for phone inquiries during the season at 802-656-5421.

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