Ultimate DIY Guide to Rainwater Harvesting

Insanely Cool Rainwater Projects

Second Rain, Inc.

Version beta

Thank you.

I want to take a quick moment to congratulate and thank you, on behalf of your neighbors, your family, your environment, for being part of the answer to the question, “What can one person do about it?”

And if you haven’t seen the CBS 60 Minutes special ‘Depleting Our Water’ - it’s worth a watch:

http://www.cbsnews.com/news/depleting-the-water/

So here is your guide, raw & uncut. Keep in mind I am completely biased and opinionated, and these are thee best and most innovative techniques here. If I find (or make) a better way, I will update this guide AND send you the updates if you have purchased it.

Note: I will not be showing you how to catch water in a trash can or barrels. You can find how to do that on a hundred websites and a thousand youtube vids. Oh no. This is much cooler than that.

Data, Case Studies, Reason

Found in this guide are specific techniques for any DIYer, urban survivalist, or responsible homeowner who is already convinced they need to catch rain— notsomuch about how many gallons of water we all waste or how bad our water infrastructure is. I could fill hundreds of pages with stories, and many good books and websites have hundreds of pages of reasons why we need to do something about it NOW. I believe you already know this, which is why you’re here. Of course, if those books contain other fabulous solutions, I will include them here and credit them for it.

I say ‘survivalist’ in the above list because if you are a serious prepper you will clearly see how these techniques and plans will give you an arsenal of new ways to catch and store a relatively constant supply of water, and do all of this completely under the radar. You know how important this is in the event that any major water supply goes down.

So that’s my lengthy explanation of why this guide is as condensed as possible (?), to get you the information you need right now to get started catching and storing rainwater, in the coolest ways possible. Ready? Let’s roll!

"Always Remember You Are Unique, Just Like Everyone Else"

-Anonymous

Where to Start

First, you'll need to establish the main reason you are doing this. Someone wanting to use rainwater to provide their entire family with water should go about the setup a little differently than just supplemental watering for a small veggie garden. If you want to water your lawn with harvested rainwater, please don't. Lawn takes a lot of water to keep it nice. Tear it out and plant some artificial turf on nice soft wrestling mat foam instead…

A garden, on the other hand, would be a wonderful use for stored rainwater.

How Much Zucchini is Enough?

First, how much water do you use? If you downloaded our free rainwater calculator, just enter the # of people in the house and any wacko extraneous uses, and voila. If you never got it or lost it somehow, you can find it at www.secondrain.com. There is a free link to it in a blog post titled "rainwater calculator."

Vegetable gardens generally need 1 inch of water per week. You can conserve more by using drip irrigation or wicking (self watering) beds, which I'll touch on later.

A 25'x40', or 1000 square-foot garden would want 623 gallons per week to be happy. That's a lot of water.

And that's a lot of zucchini.

So it's like this for most any garden:

Length (ft) x Width (ft) x .623 = gallons per week

If it's dry for say, 3 weeks, and you have a 1,000 square foot garden, you need to have about 2,000 gallons to water it through the dry spell.

Water supply from the sky

Next find out how much rainwater you can collect. Use the same formula, and you get gallons per 1 inch of rainfall on your roof.

There are other ways of collecting surface runoff, but your roof is pretty much ideal, and we'll get to earthwork later on.

A 25' x 40' roof, or 1000 ft.², can produce up to 623 gallons per 1 inch of rainfall.

Example

Let's say your roof is 1,000 sq.ft. and your mixed vegetable garden is 1,000 sq.ft., and that's all you want to use your rainwater for.

In your climate, it's not uncommon to go for 4 weeks in summer without a drop of rain, so your ideal rainwater storage might be at least enough to last 4 weeks, or (623 gallons x 4), 2,492 gallons.

Of course, you would need at least 4" of rainfall to fill it up, but you can also direct air conditioner or dehumidifier condensate, manually or automatically, into this system. These are 2 very pure sources of "greywater" that should not be wasted. And now you are not so limited by watering restrictions, and your plants would be happier with nice, soft rainwater.

This is just one example of why you might want to catch some rain, why a barrel or two is not nearly enough to store it, and just a barely a hint of how. Next, we'll start where the rain falls and dig into some serious details.

Let the Rain Games Begin

Asphalt Tea, anyone?

The ideal roof material for rainwater harvesting is metal. It stays cleaner, gets rinsed off quickest when it rains, and it lasts forever. Probably the most common roofing material however is asphalt shingles. If you're not going to be drinking it, no worries.

If you plan on drinking water from a shingle roof:

Pick up some stuff called Shingle Saver at your local home improvement store. It's an acrylic coating, in white or clear, that rolls on over your roof and protects it. It's expensive, but along with coating it so the asphalt does not leach into the rainwater, it also extends the life of your roof by 50 years or so. The water isn't drinkable yet, but at least you won't have so much chemical garbage in it.

Get your mind out of the gutter

If you don't have gutters on your house— get some…? Seriously you could still do it, but gutters would be a swell move at this point, especially if you coated your roof already. (Hey you're fast) Gutters aren't hard to install, but this isn't a gutter guide. Just slope them down 1" every 8' run toward the opening. Let's assume you have them, either 2"x3" or 3"x4" downspouts.

You could cut off a downspout and stick a barrel under it, but if you live in cold climate or get heavy rains (like basically anywhere), use a diverter.

There are lots of downspout diverters out there, and for the cost of all the fittings and finagling to create your own DIY downspout diverter out of PVC, you may just save time and money by buying a pre-made one and using the directions to install it on your downspout.

These 3 diverters are across the price range and all work on 2x3 or 3x4 downspouts.

"A Person Who Never Made a Mistake Never Tried Anything New"

-Al Einstein

Quick, Create a Diversion!

Low-end Diverter: The cheapest one I found is $25.95 -called Flexi-Fit by Rain Brothers, LLC. It's a piece of rubber that you put through a big hole you drill in the side of your downspout, and it will divert maybe 60% of the water. I have installed 2, but don't know how much of a problem it has with debris and cleaning. No filter.

Here is the link to it: http://store.rainbrothers.com/universal-flexifit-downspout-diverter-kit/ (price includes tubing and some adapters)

High-end Diverter: The most expensive at $222 is the WISY from Germany. As you'd expect, it's pretty super; stainless steel, aerates, comes with a VW van (kidding, but it'd be a lot cooler if it did). I have not used this yet, but if you've got money to burn, go for it.

Here is the link to it: http://www.rainwatermanagement.com/wisy-downspout-filter-collector/index.html

Mid-range Diverter: A good balance between them is one by Saving Rain, LLC. Designed by Master Gardener Mom, it has a large enough opening at the top to work with up to 4 inch square commercial downspouts (I have used it on a few), and works very well with 2x3 or 3x4 residential downspouts. It diverts 99% of all rain coming down your downspout, which most others don't do. It also aerates, has an easy access filter, and its winterizing plugs double as filter handles— very nice. Made in the USA. It runs about $40.

Here is the link to it: http://savingrain.com

"Each Mind Has its Own Method"

-Emerson

Great, we've got water from your coated roof, to gutters and being diverted, now what?

Drink or Flush?

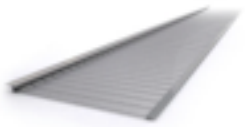
End use will guide a few decisions you make from here on - and it already has (remember the acrylic roof coating?)

It boils down to cost, really. Most of these filters can be retrofitted if you decide you want to do more filtering later on…

For the purposes of keeping this concise, let's say you want to keep cost down and collect rainwater primarily for outdoor use (58% of all home use is outside). That said, these next 2 filters are not necessary for watering plants, but also not crazy expensive and will certainly help clean it up and reduce maintenance down the road…

Gutter Guard or Foam

This is just an insert you put in your gutters that stops some of the leaves and junk from washing off the roof and into your system. They should be self cleaning, and by design they prevent clogging and reduce gutter maintenance overall.

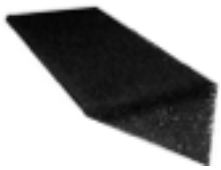


Gutter Guard ($2 per ft):

http://www.costco.com (search: "EasyOn Gutterguard 24' ")

Foam Insert ($1.56 per ft):

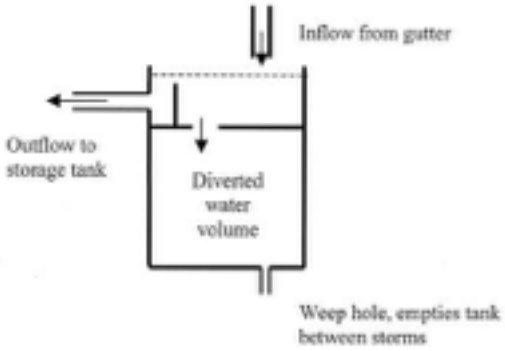
http://www.homedepot.com (search: "gutter foam")



The First Flush

As the name implies, this is like the toilet of your rainwater system. It takes (most of) the crap away, the single most effective way to get clean rainwater. Many people around the world use only this filter and drink the results. Then again, many people also get sick and die from drinking contaminated water…

A first flush is basically a junk container. It leaks! But it's supposed to. The first bit of rain starts running off, with all the crap (literally) from the roof since the last rain, and falls into this container. It fills up with this swill and inside there is a ball or float that, when it reaches the top, stops and separates the continuing runoff (a bit cleaner now)



from the dirty runoff trapped inside the first flush.

Then, when it's done raining, *Whoosh* - it flushes out the bad stuff. Ok it's usually slower than that, but gradually it drains and is ready to take the 'first flush' from the next rain.

Many people use a vertical piece of PVC **— 10' of 4" PVC will hold 6.5 gal.**

Also called a "roof washer," the size of a first flush should be relative to the roof, standard being 10 gallons per 1,000 sq. ft. of roof.

Use adapters to place it in the line before it reaches the tank or up on the gutter on the upstream side of the downspout, attached to a solid support (it's very heavy when full). The float can be a ball or empty plastic bottle.

As with diverters, there are now pre-made first flush filters that might just save you enough time over creating it all. Depends if you have more time than money, or vice versa…

Here is a great YouTube video by Rich Allen that shows how he made his diverter, along with some more great ideas for DIY Rainwater:

https://www.youtube.com/watch?v=tvIFMGuqBp8

(while you're at it, check out his solar heaters)

This free guide from GrowNYC includes details of options for making a DIY diverter/ first flush using PVC: http://www.grownyc.org/files/osg/RWH.how.to.pdf

This is a link to the prefabricated first flush filter shown above ($35): First Flush

"You Can't Have Everything. Where Would You Put it?"

-Steven Wright

Meet Roger, Over.

Now it’s time to match your ideal storage quantity with your ideal space.

I don’t know yours, but take Roger's, for example. He lives in L.A. and figures it’s time to at least see what his options for rainwater are.

Back to that calculator… Roger got ahold of it, too, plugged in the numbers from his home in L.A. with a roof size of 35’ x 55’, or 1925 sf…

…He then entered his local average rainfall amount (find yours at the link below) and calculated what CAN be stored. His home can catch over 22,000 gallons each year.

roof size: length: 35 feet
Square foot catchment area: 1925 sq.ft. width: 55 feet
Catchment area material type: metal (for runoff coeffiecient)
Potential rain collection, 1" rain: 1199.275 gallons

Rainfall amounts for: Los Angeles, CA

Month	Avg Precip (weather.com)	Harvest potential (gal/mo)	
Jan	3.98	4,773	
Feb	5.08	6,092	
Mar	2.83	3,394	
Apr	0.98	1,175	
May	0.31	372	
Jun	0.12	144	
Jul	0.04	48	
Aug	0.04	48	
Sep	0.24	288	
Oct	0.91	1,091	
Nov	1.38	1,655	
Dec	2.76	3,310	*N/A for off season if no snow melt potential
Total		22,390	gallons

Notes on water usage:
Average water use per person per day (pppd): 99 gallons
(Average in U.S. is 99 gallons - info from USGS)
Number of people in household: 2
Water usage monthly in this household: 6,023 gallons ======> indoor: 2,529 gallons (monthly)
Water usage annually in this household: 72,270 gallons outdoor: 3,493 gallons
Average outdoor water use is 58% 36,135 gallons

Notes on rain barrels:
1. Buy local. Build your own. Make it useful (planter, table, bench ;)
2. Use a diverter to place the barrel anywhere, not just under a downspout (or plan for a geyser!)
3. Modify soaker hoses to automatically water your plants-- use that rainwater!
4. Add on more barrels, benches, etc. for maximum benefit - like catching 6,092 gallons in one month!?!
5. Connect at bottom if all at same elevation or use overflow if added ones are lower in elevation
6. Be creative. Have fun. Save water. Peace Love Irrigation.

Your local rainfall: http://www.usclimatedata.com/climate/united-states/us

Roger's family water use, based on national average of 99 gal/ person/ day is 70,000+ gal/ year.

Now, Roger knows these are entirely AVERAGES - there will be a freak rainfall here and there, and anyone who is collecting rainwater will likely start to live more consciously than this— but for the sake of simplicity, he’ll go with it.

According to the stats, 58% (average across the U.S.) of all household water use is outdoor, primarily irrigating plants and gardens…

“Tanks, but no Tanks”

-Roger

Half Alive or Half Dead?

For outdoor use, Roger wants to catch enough rain to make it at HALFWAY through dry spells. Why only halfway? If his plants can’t survive any drought at all, he reasons, they don’t deserve to live. Tough love, Rog, tough love.

He believes a little struggle is actually a good thing. It makes us stronger. After all, what is the oldest living organism on earth? That ole bristlecone pine growing on a windswept, barren wasteland for 5,000 years and counting…….

Emergency Fund

Being realistic, Roger knows that basic human need is about a gallon a day or 30 gallons per month. If he can store in reserve at least 500 gallons, they can make it a month on just this. 1,000 gallons? 2 months. Without any rainfall whatsoever.

a 10’ x 20’ garden needs
112 gallons/ week,
448 gallons per month

Let’s Get This Party Started Right

Are you ready for the fun part? Because this is the fun part. Until now, you’ve been calculating, catching, directing, funneling and filtering rainwater to get it here. Let’s check back in with our ole buddy…

1,000 gallons of water would have meant at least 5 rain barrels sitting at ***each*** corner, literally, AROUND the house.

A week earlier, Roger only knew of the barrels his city was giving away.

Even IF they were free, Roger’s response? “Tanks, but no tanks.”

He wanted to do something different so he started looking for ideas online. Surely with about a billion people posting stuff, someone has felt the same way and come up with an alternative. He bought this guide, started reading, imagine his surprise when…

Hi, Roger!

“The Best Way to Predict the Future is to Create it”

-Abe Lincoln

That Was Weird.

Seriously though, what are the main reasons people don’t want to use tanks or barrels?

1. They are not attractive. Come on, you have to admit that.
2. The cost and thought of shipping is just ridiculous.
3. They take up valuable space in your landscape.
4. Finding and cleaning used ones isn’t always safe or easy.
5. One barrel is not enough to make a significant difference .
6. Using new plastic to manufacture them is counterintuitive.

The bottom line is that barrels are not enough as a stand-alone option for homeowners.

So let’s think outside the barrel. Or tank. Why? **Why Not?**

Instead, imagine, if you will, being able to mold that barrel into a seat, a table, a building of some sort — and not near your downspout but anywhere on your property, even far away from your house…

Thinking? Fantastic. Shall we see what Roger came up with?

“Action is the Real Measure of Intelligence”

-Napoleon Hill

Forget the Barrel…

Roger really wants a vegetable garden, but random watering restrictions and without any reserve of water, those veggie plants don't stand a chance.

First, he needs to find enough space on his small lot for at least 1,000 gallons of storage. "Over 18 rain barrels?! No way!!" —Wait, stay with us, Rog! Remember: Forget the current options, forget the barrel…

As far as projects that had been on the horizon or at least talked about, Roger's wife Sarah mentioned she would love a daybed, and Roger was planning to build one out of pallets. He just needed to find some pallets…

Keeping Up is Hard to do

They have a patio, but some friends down the street had an outdoor kitchen put in about a year ago. It is great for entertaining, and Roger loves to grill out with friends, so he got a quote. At $15,000, it proved to be more than they bargained for. And Roger, while an avid DIYer, isn't keen on the idea of moving and cutting tons of concrete or stone, so they're saving up for a smaller version.

Roger's push lawnmower and his other tools have been crowding the garage, and with a garden in the future it would be handy to have a little garden shed…

Back to the Future…

Fast forward 4 months: Roger is firing up his new grill, getting all set for the neighborhood party they are hosting. From the street, the only indication that anything is different is the following:

1. His landscape looks healthier than ever, even though it is brutally hot, dry and there is a watering ban in effect.
2. A small rectangular box is attached about halfway up each downspout, with a 1” round tube from each going down to the ground.
3. There are a couple of cedar day beds in the garden in the front yard, with a cute little rain gauge on one of them shaped like a rain drop.
4. You can just glimpse an new garden shed out back.
5. There is a ‘raindrop’ sign by the street that reads: “Are You Looking at My Rain Barrels?! Try to Find All **72**”

“FACT: Water is Our Most Precious Resource”

-“Water From The Sky” by Michael Reynolds

The Versatility of a Simple System

Roger’s largest capacity of water storage is part of his second DIY Rainwater project, the garden “WaterShed." Once again, he built exactly according to the instructions that came with this guide. He was already familiar with the system, since it uses the same basic liner with welded fittings and it’s really a repeat of what he already did, just a few more times.

It is 12’ x 16’ and stores 1,680 gallons. The extended metal roof increases rain catchment area to 14’ x 24’. The shed is located at a lower elevation than much of his property, so he installed a solar pump with retracting hose reel to water all of his landscape. **Total WaterShed material cost: $2,500**

Runner up with a 1,080 gallon capacity: He put together some seating, a bar and built-in grill on his patio: basically an outdoor kitchen. The setup can be used with his gravity-operated watering hose or connected to the pump. He capped all surfaces with manufactured stone caps (wetcast concrete that looks like stone).
Outdoor kitchen material cost: $2100

Sleeping ON the Rain, Not in it…

Roger’s first project was a simple cedar daybed that holds 300 gallons, with outdoor cushions. Placed in a shady spot at the edge of the lawn, Sarah was thrilled and loves the smell of the cedar. He used the instructions included; it took one weekend and **cost $600 to build**.

And just so there wouldn’t be any arguments over who got to use it, he built another one and placed it near the first. This one took half the time to build since he had already done it once. **Same cost, $600**.

"What's Another Word for Thesaurus?"

-Steven Wright

Show Me the Plans Already!

All totalled, by following some detailed instructions, Roger now has 3,960 gallons of rainwater storage *inside* 2 daybeds, 1 garden shed and 1 outdoor kitchen. Total cost was $5,800, or **$1.46 per gallon**.

Cost Comparison Analysis

That's equivalent to 72 rain barrels. A quick search online for rain barrels revealed this: Most are over $100; here is one blue beauty for $95, **or $1.73 per gallon**:

You read that right. The 2 daybeds, garden shed, *and* outdoor kitchen ACTUALLY COST 10% LESS THAN BARRELS, not to mention finding a place for 72 rain barrels…

Got room for this many barrels?

Luckily, Sarah and Roger had been saving for the more 'traditional' outdoor kitchen for a year now and had not taken a loan for it, so they took the $7,500 they saved and put it toward this project. Now they have $1800 left over to go on a trip!

Wanna hear something even cooler? They just checked with the local water utility and city: They will still get the same rebates as rain barrel. Way to go, lawmakers!

"I Refuse to Join Any Club That Would Have Me as a Member"

-Groucho Marx

DIY Rain Party

Sure, Roger put in some time, and was it worth it? **You bet it was.**

Most of the progress came on 3 "weekend work parties" when, after he had all the materials and plans ready, he invited a few friends over (who happened to be DIYers) for a project, pizza & beer — the pizza during, beer after!

In the end, **they spent 1/3 the money they thought they would have on just the outdoor kitchen** and got much more: their outdoor kitchen, 2 daybeds, a garden shed, 72 barrels worth of rainwater storage and an easy system to use it.

Now his buddies are having their own "weekend work parties," and Roger is happily helping them out building their own DIY Rainwater projects.

"Ok normally I don't read instructions," you may say, "But just for fun…"

Alrighty then, here are some links to a growing number of Second Rain's 'DIY Rainwater Project' plans. Some of these may have been included along with this guide, and you can find the most updated versions at secondrain.com.

These plans are included with DIY kits that include liners and fittings, some tubing, but no lumber. Buy that locally and save cash.

We'll start right off guns blazing…

The WaterShed - 1680 gallons

If you've got a garden, or chickens, then you want a 1680 gallon WaterShed …is it a garden shed? is it a chicken coop? is it 30 rain barrels? Yes, it is. sans barrels.

Material cost for this DIY WaterShed: $2,500 (includes approx. cost of locally sourced lumber)

To access downloadable plans for this 12'x16' "WaterShed" or one of the 1,080 gallon Outdoor Rain Kitchens, go to secondrain.com and sign up for the Newsletter on the right side. Sorry they are not ready yet, but everyone on the email list will get an email as soon as we roll them out.

Here are my girls testing out an almost finished one— my own neighbor's! Looks like I've got some keeping up to do!

The Studio - 400 gallons

A little smaller, but just as smart as the WaterShed, this Passive and Active Solar Heated greenhouse/ studio is perfect for Mom. Literally. I built this exact design with my sister for our Mom.

In Wisconsin in winter, the sun is low enough to come all the way in the windows to flood the 400 gallon bench along the north wall with light, and heat. An automatic solar hot water heater turns on when the sun is shining on it and heats the 400 gallons of water quickly, which, due to the amazing thermal mass of water, keeps it nice and warm inside.

(left) Mom's studio in progress, openings for windows below, solar water heat above, and 400 gallons in a rain bench inside along the north wall (look close) Totally wrapped with second-hand polyiso insulation for R-18 walls, R-36 floor and ceiling!

…and Revis, my sister's golden.

(right) Solar hot water heating using PEX and aluminum transfer plates, leftovers from my radiant floor project.

Plans for this will be added as soon as we finish it!

“I’m Against Picketing, But I Don’t Know How to Show it…”

-Mitch Hedberg

Cedar Rain Bench - 300 gallons or 420 gallons

Plans for the 300 gallon cedar bench as seen on the TV show Tiny House Nation:

http://www.secondrain.com/300gCedarRainBench

password: SitThereSaveWater

It’s 19 pages long so that may be a separate attachment from this guide. This same kit can be modified to hold a maximum of 140 gallons if build to the 420 gallon plans.

"Big shots are only little shots who keep shooting"

-Christopher Morley

The Rain Bench - 65 gallons or 140 gallons

And, if you want to start smallest, to see how a basic rain bench works:

Original 65g Rain Bench DIY kit/ using 1 sheet of T1-11 plywood (shown left). Here are the instructions that came with it:

http://secondrain.com/wp-content/uploads/2012/01/RainBenchCANADA2011feb.pdf —it's not only for Canadians, but it does include the French version (Parlez vous Francais, s'il vous plait?) **This has been updated with the 140 gallon cedar rain bench instructions, but both still work.**

The DIY kit and liner have grown but the basic design has been the same since 2008. We have never had a liner fail; they are guaranteed 2 years, and operation is very simple.

The updated instructions that will be included with the140g Rain Bench DIY kit are included with this guide as well (see appendix), which show you how to build this cedar bench (left).

Cost for the above DIY Rain Bench kit is **$79, with free shipping.**

Cedar Rain Bench/ Daybed "wrap & cap" to cover 2 of the original 65 gallon benches with cedar (130 gallons, right): http://www.secondrain.com/cedar-130-plans/

password: ILoveWater

"Nature does not hurry, yet everything is accomplished"

-Lao Tzu

Outdoor Rain Kitchen - 1,080 gallons

Once you've built one rain bench, it's really not a stretch to imagine building another, and one more… and the next logical step would be to start arranging them until you have a fully functioning seating area, counters, tables, a bar, built-in grill…

OK you might not be the outdoor entertaining type, but chances are you have friends or family or both. And chances are you invite them over once in a while. If you don't have a patio, you might just hang out in the backyard on nice summer days, maybe grill some burgers or brats.

How cool would it be, next time you have a few friends over, to have a beautiful, comfortable place outside to sit, grill, eat, drink, be merry, **and also have that very place function as your entire rainwater collection system?**

That's what is not only possible, but completely affordable and buildable by any Do-It-Yourself homeowner or Handyman using these DIY Rain Bench kits.

Need Proof? Here's one.

"Lay Hold of Something That Will Help You, and Then Use it to Help Somebody Else"

-Booker T. Washington

Self-Watering Garden (SWG) - 65 gallons or 260+ gallons

Remember that watering requirement back on page 7?

a 10' x 20' garden needs
112 gallons/ week,
448 gallons per month

Yep, that's the one. Now I don't think that factors in evaporation, which is a lot. But if it does, here is a way to take that right out of the equation and make your irrigation much more efficient…

I will go over a small wicking bed here (and by small, I mean 2'x 3', not like a plastic bottle planter - they're nice but you don't need to pay for how to do that. It's online all over the place), and a larger one (3'x8') with 3 options to make them work.

First, after testing and testing I have to say that every place has its own unique variables that have to be considered when building your own.

That said, here are the basic steps to make a self watering (wicking) bed:

1. Build or find an empty box or container the size you want your garden
2. Line the inside with a layer of fabric (heavy duty weed barrier), then waterproof liner, then fabric (fabric is optional to extend life of liner)
3. Add a vertical inspection tube to see water level and to fill the reservoir,
4. Pop a perforated tube through the liner where you want it to overflow

5. Create volume for air/water and increase the capacity of the reservoir,
    - examples: stone, milk crates, pots, buckets (upside down), pipe
6. add some growing medium (compost mix) and grow some veggies!

Clear as mud? I like pictures, too…

I also like when someone tests stuff, comes up with the best version they find, and includes it in the DIY Guide I just bought from them… So here you go! The testing is always ongoing, so here is where we are now:

If you already have a rain bench and want a self watering planter, this retrofit goes right on top of a standard Rain Bench (RainBenchCanada link above).

Take off the cap, plop one of these 8” deep trays in:

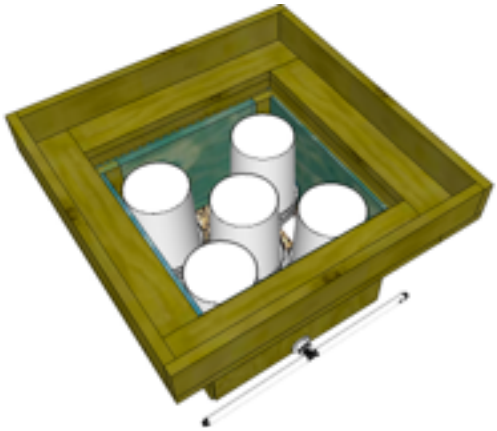
https://www.menards.com/main/building-materials/concrete-cement-masonry/concrete-accessories/shape-super-tub/p-1480926.htm ($13 here) , cut out the middle of the old cap and trim it out with 2x4 and decking.

Also, cut out the top of the liner and tack it up to the sides. Drill a bunch of 1/2” - 1” holes in the bottom of the tub, tie a knot in some old t-shirt shreds and insert so the knot is at the top and doesn’t fall through. The shredded t-shirt will suck up water and make it available to the plants.

This will create a 2’ x 3’ self watering planter with 65 gallons of rainwater storage.

“A Diamond is a Piece of Coal that Stuck to the Job”

-Michael Larsen



For a 4’x4’ raised self-watering garden, you can use cedar or plastic lumber that lasts forever, or you can use treated plywood and coat it. The version to the right uses the 140 gallon DIY Rain Bench liner, fittings, and 5- upside down 5 gallon buckets. This will handle larger, deeper rooted plants and wick better due to the soil going all the way down to the bottom of the reservoir. The buckets give at least 25 gallons of capacity, with another 25 gallons (at least) in the air space in the soil.

For a full-blown Self Watering Raised Garden, extend the above design to 8’ for 300-420 gallons. It’s a nice size for a permanent vegetable garden near the patio.

Plans for the self watering gardens are posted on the blog at secondrain.com

"Home is Where the House is."

-Jack Handey

Getting All Hooked Up

The fittings to connect 1" tubing come with the Rain Bench DIY kit and Saving Rain diverter. 1" I.D. (inside diameter) vinyl tubing is available at various sites online, and at secondrain.com. This is very easy to use, cuts with a knife and no need for clamps if just gravity pressure.

It's also worth mentioning again the fact that the Rain Bench should be filled from the bottom, and overflow from the top fitting.

The Rain Bench DIY kit hooks up to garden hose as well, but we've found that 1" diameter is much better for flow (garden hose restricts, too small)

Pump and hose reel add-ons

The pump here is a 1/2 hp Wayne pump, self priming ($110), and hose is a self-retracting Flexzilla Air hose -also works for water ($60) and a few misc fittings to adapt it to garden hose.

The hose shutoff hanger is simply 2 screws. (insert diagram/plan)

The picture to the left is pretty much the same setup inside a bar on a patio.

And hey, if it ain't broke, don't fix it. The one on the right was our very first pump hookup with a retracting air/ water hose in 2009. It's under a deck and still works just fine!

So what's happening back in Roger's neighborhood?

…Now if Roger was smart, he would keep a water reserve, but also use some right away so there is empty space for the next fresh rainfall. Is Roger smart?

Roger is Brilliant.

He did these things— I mean, he doesn't want to look like a complete idiot in front of the world here— but then he took it to another level…

He wanted the convenience and security to be able to have pressurized water even if the power went out, so he used a small 12V RV pump, battery and solar panels to charge and operate it. Ole Rog set it up on a timer (using only excess solar power) to regularly recirculate and aerate to keep the water clean.

Not quite there yet, but happy to have the plans for it, he also wants to eventually add a complete filtration panel (like the one shown below) to be able to use rainwater for all household needs, including drinking. Recent events have raised questions as to the reliability of safe, clean public water supply…

More Sweat Than Money

Possibly the cheapest and most effective thing he did, however, came out of recently reading the works/blogs/ books of Brad Lancaster, Owen Dell and Art Ludwig. To the high point of his landscape Roger directed one tube from his closest downspout diverter, along with a drain line from his washing machine (go greywater!).

The picture above is just after Brad harvested the equivalent amount of rain as a 1,000 year storm event by using this technique. Read how: http://www.harvestingrainwater.com/2014/10/09/harvesting-rain-from-a-1000-year-storm-event/

From there, the rain and greywater slowly follow swales Roger made, back and forth in his planting beds and even the edge of his lawn, so it ideally never leaves the landscape and continues to gradually soak into ground.

***** This Is Key *****

Note: I am in no way affiliated with Art, Brad or Owen. They are just smart, honest, environmentally conscious dudes who tell the truth. This is basic permaculture.

A Concrete Jungle

If you're wondering why all of a sudden we have to do this, why the urgency to get every drop of water that falls to go into the ground, look no further than your local shopping center or pretty much any business center. It has been the progressive covering of the ground with impervious surfaces that has been blocking this water infiltration, instead channelling it as fast as possible to the nearest waterway, where it then drops all the pollutants it just picked up before it flows further away, eventually out to sea.

At the same time, the increased development has been demanding more water, which is pumped from the very groundwater that rainfall is being blocked from recharging.

Now you can see how quickly this can cause problems, and the importance of every home with a roof and green space to be adapted to offset this effect, if our kids are to have any groundwater left to pump…

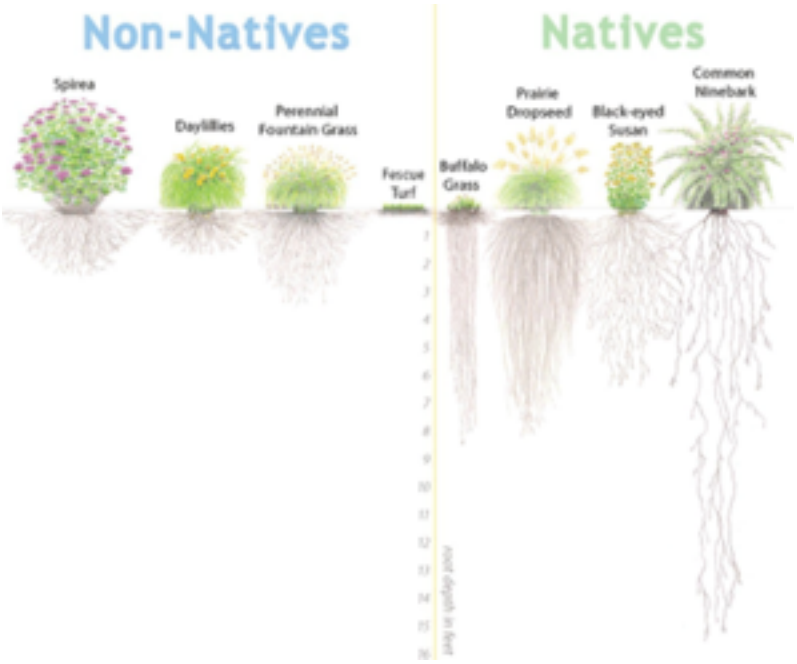
"What you can't see is often more powerful than what you can"

-somewhere on this page…

So ole Rog, after a day of thinking and digging, made a 'dry stream' - or more like a series of 'dry pools' that meandered back & forth through his property (around his house), so that now the same surface runoff has to travel about 30 times as far to get off is land… What is it doing while it meanders?

Let This Sink in

After 24 hours or so, there is no standing water. Where did it go? Into the ground. What you can't see is often more powerful than what you can.



When he was done, Roger took an area that was previously graded to GET RID OF water and transformed it into a fertile series of meandering beds, planting them with things that send down very deep roots (See above root depth diagram). Not all that noticeable— unless you are water.

Before, when it rained, water would runoff where it pleased, going far around plants that desperately needed it, and doing NOTHING to sit and soak in, but now…

…Now even if he did not have all the ridiculously cool rainwater storage (ever think you'd utter that phrase?) — now just from the landform alone he has a MUCH more self-sustaining landscape.

Get Ready for It

And just when Roger starts getting comfy, grilling on his new rainwater system, in his new, lush landscape, his phone rings.

It's his neighbor. He read the yard sign in Roger's yard. He is wondering how on earth he fit that many rain barrels in his yard, where they are, and how his plants are still alive in this drought…

"Come on over," Roger says, "I'll show you how."