

Clip-on Hydroponic Wall Garden

by **BackyardCreations** on May 6, 2015

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Intro: Clip-on Hydroponic Wall Garden

Hello, this is our step by step guide towards creating your very own fully custom portable clip-on hydroponic wall garden. This project is very easy to build, requires very little tools and uses minimal hardware materials, making it a perfect project for everyone who loves gardening!

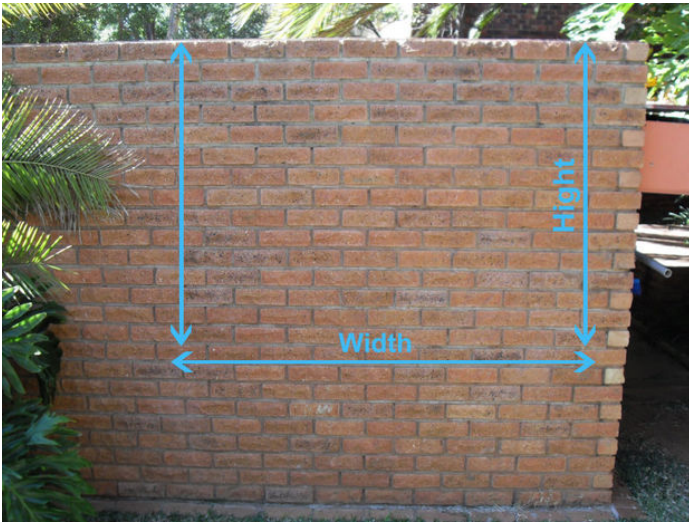
I hope you guys have just as much fun building this DIY garden as we did!



Step 1: Pick a appropriate spot for your wall garden:

Picking the appropriate spot for your clip-on hydroponic wall garden is crucial for the success of the project.

- 1 - Check that you have a sufficient amount of space available for the wall garden.
- 2 - Make sure there is enough space on the back of the wall for the clip-on design to be save and fully effective.
- 3 – Ensure the wall receives the right amount of sunlight for your plants.



Step 2: Materials required:

Below are the materials required to successfully build a clip-on hydroponic garden at home.

Materials required for the Frame and Adjustable Tray Brackets

- 50mm PVC Piping, preferably white
- 14 X 50mm PVC Bends
- 6 X 50MM PVC T-Connections
- Roll of Sanding Paper (50-150 grain)
- Tube of PVC Glue
- Duct Tape

Materials for the Grow Trays

- Square PVC Gutters
- 50mm PVC Pipe
- 6 X Gutter End Caps
- 3 X 36 - 50mm PVC threaded Adaptor
- 3 X 50mm PVC threaded Adaptor
- 3 X 50mm Straight PVC Adaptors
- Stainless Steel Mesh
- Hydroponic Grow Medium (LECA or Perlite)

Materials for Irrigation System

- 50L-100L Water Reservoir
- Flexible tubing
- Water Pump (Flow Rate 1400L/h, Head 2m)
- Cable Ties



Step 3: Tools required:

Tools required to complete the project:

- Hand Saw
- Electronic Drill
- Tape Measure
- Pen
- 50mm Hole saw
- 36mm Hole saw



Step 4: Measuring your wall:

Write down the measurements in the instructions below on a piece of paper where instructed as it will be required in later on in the project

Before you start measuring the size of your bracket and the wall you must first determine how long your grow trays are going to be.

-First take the tape measure and determine the length of your grow trays. For the best performance they shouldn't be shorter than 1m and no longer than 2m. Write down T along with the length you decided on for the grow trays on a piece of paper. Eg. T 2m

Now that you know how long your grow trays are going to be you can decide on the width of the clip-on bracket. Keep in mind that the trays must overlap the bracket, so you don't want to make it too long nor too short. Between 10cm- 40cm a side (depending on the length of the trays) should work well. Mark A on the piece of paper you used earlier and write the length you decided on next to it. Eg. A 1.70m

Wall width

Now take the tape measure and measure the width of the wall where the wall garden is going to be. Note that the PVC Pipes slide into the bends you are going to use later on so you must take that into consideration when doing the measurements. Make the fit as snug as can be without causing damage to the wall as it will help with overall stability. Mark this length as C on your piece of paper. Eg C 25cm

Wall Height

There are some things to consider when deciding on the height of your wall garden.

-As the reservoir will be standing underneath your garden it needs to be at least the reservoirs height plus an addition 20cm of the ground.

-The frame height can't be too narrow as there is a sufficient amount of growing space needed for each grow tray.

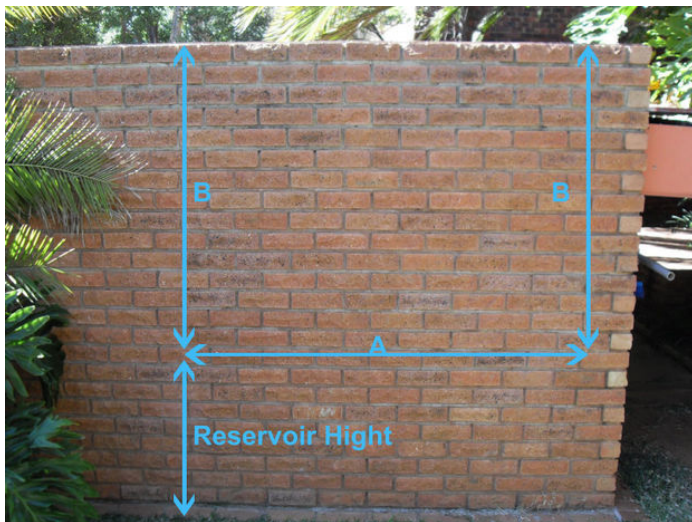
First take your measuring tape and determine the height of your water reservoir with the lid on.

Now take the tape measure and determine the height of your wall from top to bottom.

Now take the height of your reservoir (reservoir + 20cm) and subtract it from your wall height. Like before write this length down as B on your piece of paper. Eg. B 1.8m

Measure PVC Gutter/Grow tray width for the sliding arms.

Measure the width of your grow trays with a measuring tape. Write down that that length with D next to it. Eg. D 15cm



Step 5: Time to cut the PVC pipes and gutters:

In the previous step you did all the measurements for the grow trays and pieces of PVC piping you will need in this step.

For this step you will need a Hand Saw, Pen and Measuring Tape.

Take the piece of paper you used in the previous step and cut the amounts given below for each letter with your hand saw.

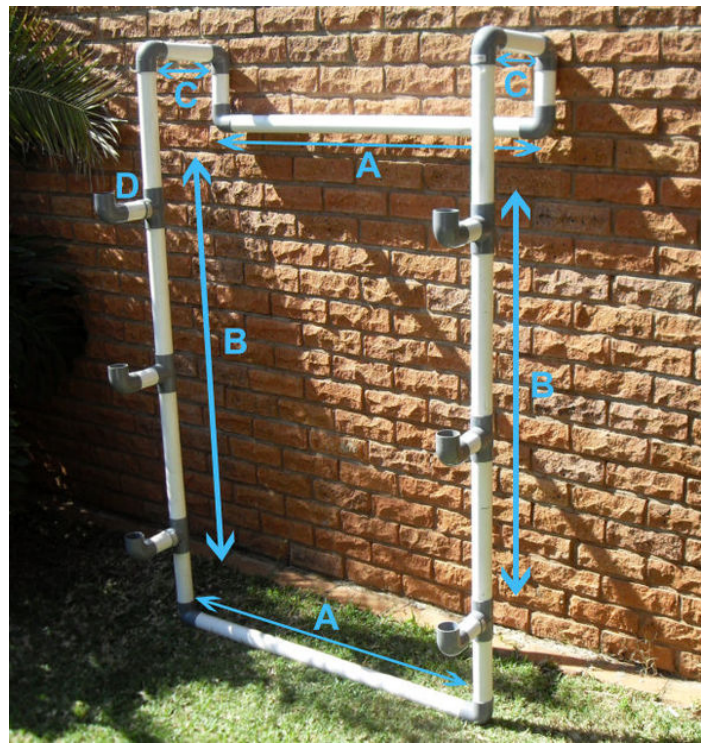
- 2 X A's

- 2 X B's

- 4 X C's

- 6 X D's

3 X T's (Grow Trays)



Step 6: Build the sliding grow tray arms:

The 50mm PVC T-Junctions does not let PVC piping slide right through the junction. This means you have to sand out the inside diameter so that the PVC piping slides freely within it without being too loose. This is the most time consuming aspect of the build and requires a certain amount of accuracy in order for the arms to function properly.

This can be achieved in a 2 ways:

With an electronic drill, a role of sanding paper, 50mm whole saw and some duct tape. As illustrated in the picture above. Be careful of over or irregular sanding when using this method. I found it works best to twist and turn the T junction around regularly.

Manually with some good old fashion elbow grease. Take the role of sanding paper and roll it up as close to 50mm as possible. Sand out the inside until it fits over the 50mm piping.

For this part you will need some PVC Weld/Glue

Now that you have correctly sanded out the T junctions it is time to assemble them. Take one length D piping and assemble them with each of the T junctions you just made as illustrated in the picture above.

Be sure they are aligned straight and the bits and pieces are glued together properly.



Step 7: Building the frame:

For this step you will need some PVC Weld/Glue.

Slide on 3 of the adjustable tray arms you just made to each one of the B pieces.

With the PVC Weld, assemble your clip-on frame as shown in the picture above

-Make sure that you use enough glue on the joints. Leave each joint to harden for about 5-15min (depending on the glue used) before continuing with the build.

- Also make sure your frame as is as straight as possible. Skew connections at the top of the frame can have a negative affect later on. Building each side first on a level platform before assembling the frame works well to keep things level.



Step 8: Adjusting grow tray levels:

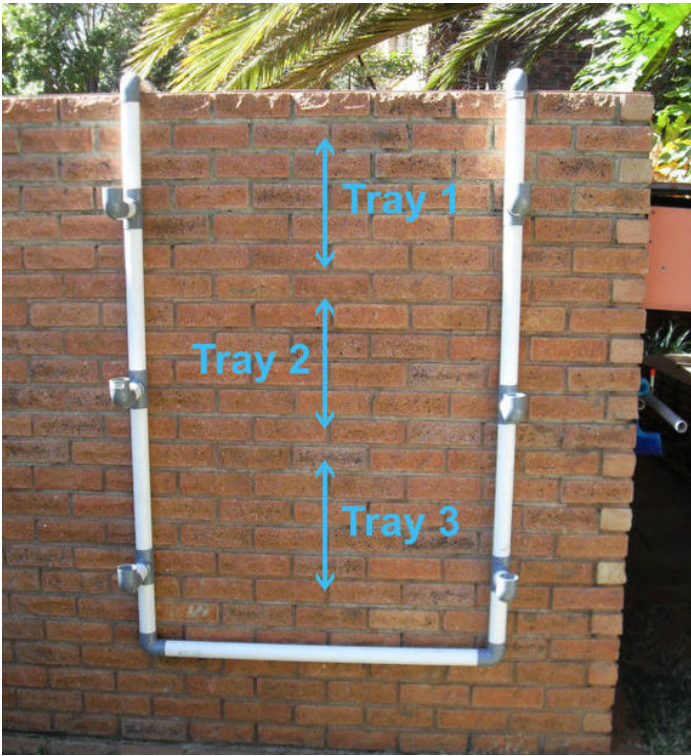
It is time to hang your frame on the wall. Check that everything fits well and that the frame is stable before continuing with the build.

With a measuring tape determine how high each of your levels should be. Swing the tray arms up to the correct level for each, ensuring that all of them are level to its opposite partner.

In order for the systems drainage to function properly each of the trays must lean a little bit lower to the one side. To achieve this simply slide the one side of each trays slide arms down 1cm, starting with the top left corner so that the water flows toward the left. Do the exact same with the middle and lower tray slide arms so that the water flow ends up at your reservoir.

Note: Flow can be adjusted at anytime to suit your specific needs.





Step 9: Building the grow trays:

For this step you will need some PVC Glue.

Insert an end cap on all of the gutter sides. Make sure they are correctly inserted and is flush to the end of each grow tray.

Line the inside of each end on of the gutter with glue for extra protection against sneaky leaks.



Step 10: Install drainage ports into grow trays:

For this step you will need an electronic drill and 36mm hole saw.

Drill a 36mm whole at the end of each grow tray.

Screw in the 36mm PVC threaded adapter into the whole. Then at the bottom of the tray screw in the 50mm threaded adapter along with the straight PVC adapter as shown on the picture.

Cut a round piece of steel mesh and insert it into the threaded adapter in the grow tray.



Step 11: Install grow trays:

For this step you will need a handsaw and measuring tape.

Put each complete tray on its designated level.

Now take the measuring tape and measure the distance between the bottom of each trays drainage point to the tray level beneath, apart from the lowest tray.

Take the Hand saw and cut the required lengths out of PVC piping to complete your drainage ports to the lower tray level.



Step 12: Install reservoir:

For this step you will need a handsaw, drill, 50mm hole saw, 36mm hole saw and measuring tape.

Place your water reservoir under your wall garden on a level surface and mark the spot where your drainage pipe and irrigation lines are going to enter your reservoir. Take the drill and drill a 50mm whole on the spot for your drainage and 36mm hole for your irrigation line.

Now take the tape measure and roughly measure the distance your last drainage pipe needs to be from the lowest tray to your water reservoir. It can be as long as you want as long as it doesn't stick out of the reservoir.

Place your reservoir on its spot and insert the last drainage pipe so it enters the reservoir.



Step 13: Install irrigation line:

Insert the one end of your irrigation line through the hole in the lid of your reservoir and connect it to the water pump. Lead your irrigation line to the top right corner of your wall garden. When running, your water will flow in a zigzag pattern, irrigating on the one end and draining at the opposite end.

-Make sure you don't bend the pipe to much as it may snap and influence your flow.



Step 14: Finishing steps:

Fill the Trays With Grow Medium.

I find a mix of perlite and LECA works well but any soilless grow medium can be used.

Fill Hydroponic Reservoir with nutrient solution.

The hydroponic medium and nutrients can be bought at Amazon. We recommend the following:

- Leca Clay Pellets
- General Hydroponics Flora Series



Step 15: Final checks:

Before you switch on your hydroponic wall garden do the following checks first.

- Check that everything is stable
- Check that your power source is away from any moisture.

Now switch on your system and check that the water flows evenly through all the trays without any restrictions. Also check for possible leakage points.

Should everything check out you are now ready to start using your brand new clip on hydroponic wall garden!



Related Instructables



My Indoor NFT Hydroponics System (Photos) by EcoMotive



Single Dutch Bucket Hydroponic System - Easy DIY - Patio - Balcony - Winter Gardening (video) by mediamaker2000



Home Hydroponics - A manual on how to build your own hydroponics system by JaredStanton



Hydroponics with Reclaimed Materials by pumpkinhead24



DIY Hydroponics Top Drip Bucket System (video) by Get Forked



My First Hydroponic Plant (Beginner's Guide) by ASCAS

Comments

2 comments

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hegure_ryu says:

I've been thinking about making one of these. This gives me some reference ideas.

May 6, 2015. 1:03 PM [REPLY](#)



audreyobscura says:

Brilliant! Add some photos when you have more growth in the garden!

May 6, 2015. 11:26 AM [REPLY](#)