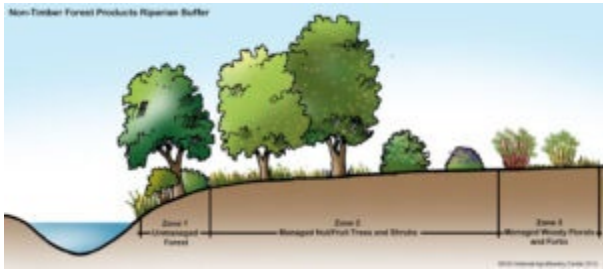
Introducing

151 Rock Farming

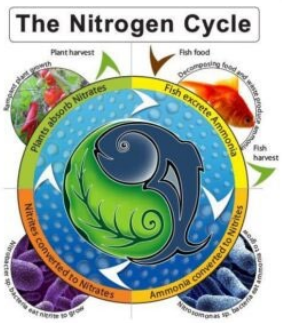
'We Bring the River to Your Roots'

Nature offers the best blueprint for growing plants anywhere on the planet. Along streams and rivers, plants thrive on the steady movement of water past their roots. Water churning over rocks releases minerals and adds oxygen, creating the ideal food source for plants in what science calls the Riparian Zone.



For over 20 years, 151 Farms has researched ways to grow plants in optimal conditions, indoors, in greenhouses, and outdoors. We tailor our system design to mimic nature, so crops can thrive in regions not traditionally suited to cultivation. Our focus is bringing farming to urban environments through a "farm to fork" model that delivers fresh food within 150 miles of where it's grown. Urban farming is a managed industry opportunity to eat healthier, support historically depressed communities, housing and create jobs at every level, from entry-level to advanced degree. These are hand-up opportunities that benefit the whole community, regardless of ideology. To be a 151 Farmer, you only need to eat. If you eat, you're in!

Our preferred approach is what we call 151 Rock Farming. The system uses black lava rock, the same medium that, as seen in Hawaii, supports plant life on its own, paired with the benefits of the Riparian Zone. Lava rock is porous, so it houses the beneficial bacteria that convert nitrites in fish wastewater into the nitrates plants need at the roots: the Nitrogen Cycle in action. Running fish tank water through the rock beds also filters the tank, keeping water clear. Happy fish are active fish: they eat, grow, and breed, sustaining a steady population. Co-cultivating fish is a major bonus for the garden.



151 Rock Farms are raised-bed, modular, and scalable, with a forklift-portable design. They cut water use by up to 95% versus traditional soil cultivation. A closed-loop, aerated flow circulates between the freshwater fish tank and each plant tub. Constant flow beneath the lava rock minimizes evaporation, and filtered fish waste is the only nutrient the soil-bed plants receive through top watering.

Raised-bed gardening has well-known advantages. What sets the 151 Rock Farm apart is mobility: each system is built on a 275-gallon industrial tote with a palletized base, so a forklift can relocate it whenever needed. Mature plants that would normally be lost to fire or other disasters can be moved to safety with advance planning.

Gardens should be a place of comfort and sustenance, our connection to nature. Our design is functional and attractive, with the mechanical elements understated so the plants take center stage. Robust, healthy plants at eye level please the eye and the soul. The system invites curiosity about where food comes from and the symbiosis between plants and fish, while cultivators provide the environment and tools to maximize the return.

A 151 Rock Farm delivers years of service while building community around water conservation, self-sufficiency, and organically grown food. Starting at $2,500, the system is affordable, integrated, and expandable up to 6 rock tubs. Each ready-to-install package includes pre-established plants, lava rock inoculated with beneficial bacteria, fish, an air pump for oxygenation, and a tank pump/filter that captures fish waste to feed the soil-bed plants.

Ideal locations would be:

Residential

Commercial

Restaurants

Co-Ops

Nursing Homes

Rehabilitation Clinics

Urban Environments

Community Gardens

Prisons

Schools

Site Preparation:

Stable, compact and level ground for the fish tank and the rock tubs to be placed.

Tubs will weigh approximately 2,500 lbs. each. If there is any doubt as to soil stability it is recommended that the tubs be placed on concrete or on a 4" min. tall rock bed to prevent settling.

This design would allow for the fish tank to be placed at a lower elevation but not above the rock tubs.

Access from the street to any installed location must have a minimum width of 72" for the equipment to deliver and set the system components. Delivery, set up and installation is additional and charged on a case by case basis.

Fresh water supply for initial setup and maintenance top off.

1 ea., 15 amp, 120 volt dedicated circuit. (Total equipment watts: 68)

Maintenance:

Rarely will there be weeds in a 151 Rock Box as weeds generally don't find purchase in this environment.

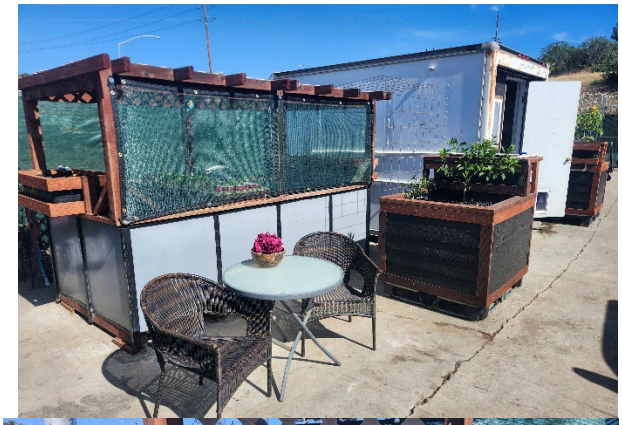
Confirm water flow through the rock tubs by a sight glance of the discharge pipe at the top of each rock tub. Adjust valves if necessary. (This is not normally an issue)

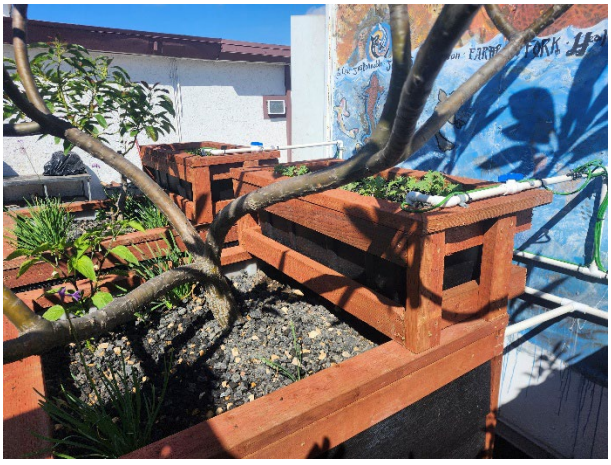
Depending upon the size and number of fish the pump filter would have to be cleaned daily or every 3 days at a minimum.

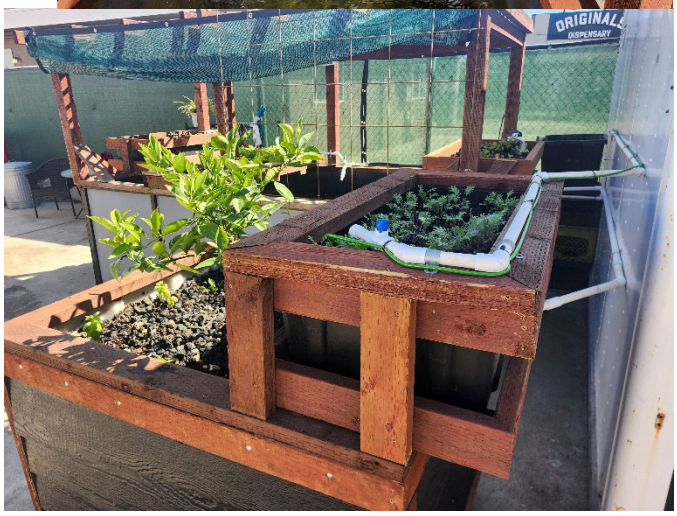
Add water in the fish tank if necessary.

Feed the fish.

Harvest plants and grow more from seed!







SPECIFICATIONS

151 Fish Tank

1 ea., food grade IBC Industrial Tote with steel cage and 60 mil plastic liner on a pallet base with trellis and sunshade.

Exterior rated, wrapped pressure treated lumber finish and lap siding for insulation and to prevent light penetration and algae build up in the tank.

1 ea., 50 watt, 790 gph submersible pond pump/filter.

1 ea., 18 watt deluxe air pump with 1 ea., air divider manifold and 2 air stones.

1 ea., Rock Box.

Overall Dimensions: 45” W x 50” L x 86” H

Water Capacity: 220 gallons

Approximate Active System Weight: 1,900 lbs.

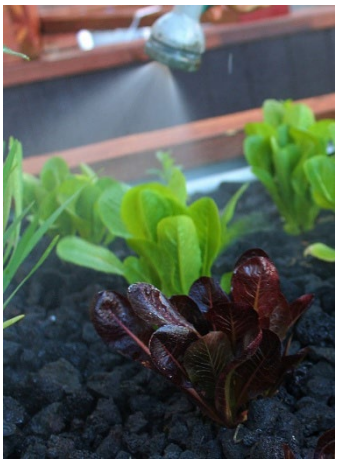
151 Rock Box

The well-established BOG Pond Filter principle is what is at work here in that the rocks act as highly effective, natural filtration system using rock and typically pond plants to purify water by removing nutrients and trapping debris. It works by pumping pond water up through a rock bed, where bacteria process waste and pond plants will absorb nutrients, reducing algae.

1 ea., 30 gal 40 mil. Polypropylene liner to house the black lava rock with ½” fish water supply and ¾” discharge bulkhead fitting to move the constant flow of circulating water between the fish and the rock box. Each Rock Box contributes an extra 20 gallons of oxygenated water in the closed loop system and comes installed above the 151 Planter Box.

Overall Dimensions: 40” W x 22” L x 14” H

151 Planter Box



1 ea., 220 gal. food grade IBC Industrial Tote with steel cage and 60 mil plastic liner on a pallet base with bottom weep holes.

2” granite rock at base weep holes.

Soils Capacity: 1 yard amended plant soil mixture.

Overall Dimensions: 42” W x 49” L x 39” H

Questions and Answers

Q: Do you have larger fish tank systems?

A: Yes we custom build the 8’ x 4’ x 4’ steel framed tank system you see in some of our pictures. This tank will hold approximately 800 gallons of water and is capable of being moved when the water level is brought down to 8-10” for relocation. These rubber lined tanks provide greater room for movement and are perfect for large ornamental Koi fish which is what we use ours for here at our farm. The tank, with fish inside, can be lifted by forklift, or crane if forklift access is unavailable and placed in its next location. As our Rock Box size is standard for all our systems, an additional 20 gallons of water per Rock Box is available to the fish. It is this constant movement of water that helps keep the water clean for the fish and creates added water capacity into the system.

Q: What is the most basic system you offer?

A: The entry level system would be our 151 Fish Tank with 1 Rock Box and the trellised frame. These systems are the foundation of the Rock Farm system as you can always add up to 6 of the 151 Planter Boxes to expand your garden at a later date.

Q: Can the system be designed for more than 6 of the 151 Planter Boxes?

A: Yes. The number of 151 Planter Boxes that can be added to the system are only limited by the space available and the relationship of fish in the system. For example, when we recommend that only 6 of the 151 Rock Boxes be in a single 151 Fish Tank System this is designed to be a median design function of fish when sizes ranging from small to full size fish. Naturally full size fish produce more waste into the system which provides more plant food. For those with space, money and desire we have had up to 12 of the 151 Rock Boxes in the system and, with full size fish, have seen excellent plant growth.

We recommend that if the project requires more than 12 of the 151 Rock Boxes in the system go to our larger 800 gallon steel tank or consider adding additional 151 Fish Tanks and networking the fish water systems with bulkhead fittings which adds an additional 220

gallons for every 151 Fish Tank added to the system. Multiple 151 Fish Tanks also provide the added benefit of developing different freshwater species in each tank.

Design consultation for all systems is included in our price because on any of the systems we sell it is important that the design allows for isolation of systems and adequate supply and return piping for optimum overall performance.

Q: How far can the 151 Planter/Rock Boxes be installed away from the 151 Fish Tank(s)?

A: The distance between the 151 Fish and Planter/Rock Boxes is dictated by pump lift capacity. For example, if the end user would like to set up the Planter/Rock Boxes on a hillside with the 151 Planter/Rock Boxes networked from the 151 Fish Tank(s) at a lower location. The pump must be able to service the highest point 151 Planter/Rock Box. From that point gravity would feed any lower elevation 151 Planter Rock/Boxes as the water returns to the 151 Fish Tank. We offer larger pumps to help with those system demands.

Q: What do the fish eat?

A: Quality floating pellet fish food is available online. We have found the AquaMax 2000 Fish Feed in the 50 lb. bag makes for happy and healthy fish.

Q: What species of fish do you recommend?

A: Our experience has been with Tilapia, Goldfish, Catfish, Koi and Bluegill as they are hardy and do well in varying water quality and conditions, rapid growth rates and will tolerate high-density stocking which provides consistent nutrients for plants.

Q: Can I order more fish and different species?

A: We don't sell fish other than what comes with our system. For additional fish there is Live Aquaponics or if in San Diego visit Alpine Fishery for those needs.

Q: Can these systems be automated and are there apps that will run them?

A: There is some automation that integrates nicely into these systems. For example, a standard irrigation control system can be used to water the 151 Planter Boxes as these are soil media systems. The nice thing about this solution is you may already have a landscape irrigation system that would allow an easy automated watering of these plants.

Whether your watering is automated or manual, what you will find is that the amount of water these plants require, because the root zone is contained inside the 151 Planter Box, is less than when planted in the ground. You'll know when adequate water distribution has been made when you see the weep holes in the bottom of the 151 Planter Box emitting some of that water. When you see that it's time to adjust the watering integral to maintain optimum watering conditions for the soil based plants.

Q: What other plants can be grown in the 151 Planter/Rock Box system?

A: Depending on the outdoor environmental conditions, any plant that would grow in soil can be grown our 151 Planter Box. Additionally, the area under the 151 Rock Box provides the ideal environment for growing mushrooms.

Q: Besides the fish waste treatment to the soil based plants, are there any supplemental nutrients that you would recommend be added to these plants?

A: To increase crop yields, plant health and decrease watering needs I would recommend Bokashi as an organic supplement. Bokashi is a soil probiotic of effective microorganisms with an optimal combination and concentration of self-sustaining microbes that are found everywhere. The strains are kept in check by their companions. One strain can't outgrow the others because they are limited by the output of waste (food provided) by fellow organisms. The culture retains an optimum balance of bacteria and fungus and yeast, while working in harmony with localized microorganisms. Go to HawaiiRoyalHemp.com to learn more.

Q: Can an inground pond with fish be used to network the 151 Planter/Rock Boxes?

A: Yes, the same principles apply in that the fish are lower in the system design which allows the water to pump up to the plants. However this design will not have the concentrated fish waste that is found in the 151 Fish Tank where fish density to water is considerably higher for the benefit of plant nutrient uptake.

Q: What design protections are in place that, in the event of a catastrophic plumbing failure that would prevent all the fish water from being pumped out of the system and kill the fish?

A: The 151 Fish Tank pump is installed 10" above the bottom of the tank which means that in the event of a catastrophic plumbing failure, the worst-case scenario is you will lose any water over 10" in the tank. That is enough water to keep the fish alive until whatever went wrong can be fixed.

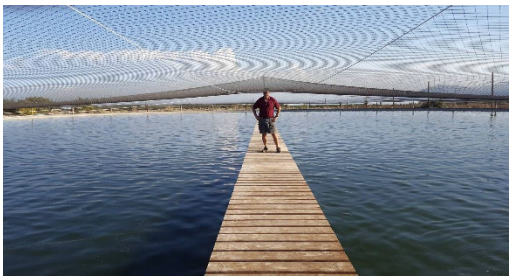
Q: Can these systems be powered by alternative solar, wind or geothermal power sources?

A: Yes. In regions where utility power is not readily available these alternative energy sources can be used to power up the low wattage, energy efficient system components. Additional design elements might also include placing the supply and return plumbing lines below the geothermal barrier which, due to the large volume of water coursing through these pipes, makes it an ideal design element in which the subgrade earth will heat and cool the water regardless of what the surface temperatures are, To learn more about the benefits of geothermal temperature exchange go to this U.S. Department of Energy link.

Q: Can these systems be installed indoors for year round crop production?

A: Yes. They are ideally suited for large scale, multi-story crop production when outdoor conditions are less hospitable. Operational costs for these installations will go up as a result of HVAC, lighting and other infrastructure expenses will need to be recovered that are not a factor in outdoor or greenhouse grown farms. Below are images that show larger scale indoor, greenhouse and outdoor aquaponic systems which will give you an idea how these systems can be utilized in dry desert regions that are not conducive to traditional crop cultivation throughout the world. This design also provides a way to "borrow" water from traditional aqueducts and run that water, with minimal loss (less plant uptake and minimal evaporative losses), through the 151 Rock Farm while returning it back to the aqueduct cleaner than what it originally took in.






Q: What prevents evaporative losses in these systems?

A: In addition to shading the fish tanks which prevent evaporative losses and predator attacks the 151 Rock Boxes maintain a water line of at least 1" below the black lava rock.

Q: Can captured rainwater be used in these systems?

A: Captured rainwater is an ideal water source. What must be determined is how much water falls in your region annually and determine how large of an area must be used to capture the amount of water your plants and fish will require over the course of a year. Our systems can be designed to offer rainwater collection which takes the water back to the 151 Fish Tank where a tank overflow outlet will take collected rainwater to a cistern which will store the water until it's needed in the system. In other words, each of your 151 Planter/Rock Boxes would act as a collection point for capturing rainwater.

Q: Can I install these systems on my own?

A: If you are the least bit handy with plumbing systems and establishing grade for the systems then yes. If not then I would recommend hiring a landscaper, plumber or general contractor to assist you with the installation. Regardless of who will be doing the installation, we are available to assist with any installation related questions that may come up.

Q: Do these systems require permits?

A: That would be a local government question. One thing I can tell you is that these are above grade, non-permanent raised bed garden equipment installations which in many communities do not require a permit.

Q: Is there a warranty on the system equipment?

A: Yes. We guarantee the integrity of the system to be free from defects for 1 year from the purchase date. Our warranty does not cover user created defects, fish/plants, labor, installation, shipping or transportation costs associated with any approved warranty claim.

Q: Are there discounts when purchasing in volume?

A: Yes. Provide us with a list of what you envision needing and we will price the quote, showing the discounts, accordingly.

Q: What are your terms, conditions and lead times?

A: Quotes are available by contacting 151DarrylCotton@gmail.com. Upon acceptance terms are 50% down with the balance due prior to shipment. Typical lead time is 3-4 weeks depending upon workload volume. We accept Zelle, Venmo and Cash App for payment.

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