



Educational Greenhouses

Structures, Systems and Equipment for Learning



Good to know.

Stuppy
GREENHOUSE

When the greenhouse is your classroom, it's good to know Stuppy.

We understand the needs of teachers in the greenhouse. Our sales and engineering team draws on decades of experience working with high schools and colleges to help you tailor a climate-controlled classroom that promotes growing plants and growing minds. We will walk you through every step of the process, from planning and design to construction, training and maintenance. Beyond conception and construction, Stuppy offers educators many resources including parts and equipment, product training and maintenance.

Our growing structures are part of the curriculum in over 1200 schools, from primary to post-graduate. Giving students access to a greenhouse opens numerous possibilities for STEM learning and career preparation, from providing a new, dynamic lab space for related courses, such as biology, chemistry and environmental science, to satisfying the objectives of a horticulture program. Even annual spring plant sales can serve as an introduction to marketing, business and accounting.

Stuppy will partner with you from start to finish. This guide was designed to assist teachers and administrators in the budgeting and decision process by providing an overview of the products best suited for educational purposes. Within you'll find information on our most popular greenhouse packages for educators, along with equipment, coverings and growing systems that can be tailored to meet your needs. Your school can count on us to deliver quality structures that are designed and manufactured in-house, where they can be engineered to be compliant with local building codes and withstand high winds and snow loads.

Contact us today to discover why Stuppy leads in designing Educational Greenhouse Environments.

A leader in designing greenhouse environments for almost fifty years, Stuppy has served the horticulture industry with a passion for quality and integrity.



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“Stuppy is proud to partner with educators guiding the growers of tomorrow towards rewarding careers in our industry. We know quality, durability and reliability are important factors when investing in a greenhouse. Stuppy’s greenhouse design and fabrication, engineered in-house, speaks for itself, along with the unbeatable service and expertise our team has to offer. Let us work with you to bring to life the ideal growing environment for your school and your students.”

Matthew J. Stuppy
President





Structures

CS3

The CS3 is a traditional “A-frame” greenhouse and a great choice for schools: it has a tall sidewall for getting the heat off students, teachers, and plants; it is an attractive addition to a high school or university campus; and it can meet the building codes required by schools. The CS3 is perfect as a long-term solution; it is covered in 15- to 20-year polycarbonate and requires very little maintenance, so teachers can concentrate on teaching and not up-keep.



CS3 greenhouses were designed to provide maximum flexibility, offering multiple ventilation options while maintaining common truss and column spacing. Trusses are designed to withstand snow and wind loads in the harshest environments.



MADE IN THE USA

Stuppy greenhouses are engineered and manufactured right here in the USA.



CS3 Specifications and Equipment

- Standard truss spacing is 12' on center. Truss spacing can be modified to 10' or 8' spacing to meet local building codes.
- Column material is 4" x 2" or 4" x 4" square steel. Top, bottom chord and purlin steel are 3" x 2". Web members are 1.5" square steel.
- 10' Sidewall height (standard). 12' Optional.
- Designed to meet local building codes. Higher loads are available.
- Outside aluminum gutter is included.
- Two 42" steel insulated handicap accessible doors (typical).
- Two Modine stainless-steel power vented heaters. Heating your greenhouse is important for the security of your structure and your investment. This heater can be ordered for LP or natural gas. Size will vary depending on climate.
- Acme Horizontal Air Flow Fans eliminate air stratification, pulling the hot air down from the peak and mixing it with the air at growing height. A manual speed control is included as well.
- American Coolair aluminum exhaust fans and one American Coolair upper gable fan.
- American Coolair self-contained evaporative cooling system with endwall application eliminates having a tank on the floor.
- Endwall rigid vent system with Wadsworth VC100A vent machine and upper gable shutter.
- One Wadsworth STEP Up controller complete with contactor panel, wiring diagram and humidity sensor.
- 8mm polycarbonate covering, with double-ribbed construction, offers superior thermal insulation and can save up to 50% in energy costs each year verses other coverings. Polycarbonate has a standard 15-year warranty against yellowing.
- Sensaphone alarm automatically calls to alert of potential problems.





Structures

Rainbow® Plus

For a budgetfriendly, Quonset-style house, the Rainbow® Plus is a solid long-term solution that requires very little maintenance. This greenhouse comes with a rounded roof and 8' or 10' sidewall options that provide maximum space for movement and efficient environmental control. The low-profile roof line of the Rainbow Plus® reduces heated surface areas for efficient temperature control.



Strong and durable with polycarbonate covering, this gutter-connectable greenhouse offers a flexible design that can be tailored to your needs.



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Rainbow® Plus Specifications and Equipment

- A structure for the future. Outside “L” connectors are hot dipped after fabrication, and help to make construction simple and easy by providing built-in connections for columns, bows, horizontal bottom members (HBM) and eaves.
- Easy connection of an HBM or truss allows the greenhouse to meet the toughest weather conditions.
- Designed to meet local building codes.
- 8' Sidewall height (standard). 10' Optional.
- Two 42" steel insulated handicap accessible doors (typical).
- Two Modine stainless-steel power vented heaters. Heating your greenhouse is important for the security of your structure and your investment. This heater can be ordered for LP or natural gas. Size will vary depending on climate.
- Acme Horizontal Air Flow Fans eliminate air stratification, pulling the hot air down from the peak and mixing it with the air at growing height. A manual speed control is included as well.
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- Sensaphone alarm automatically calls to alert of potential problems.





Coverings & Shade Systems

COVERINGS

Corrugated & 8mm Twinwall Polycarbonate

Polycarbonate is a cost effective, long lasting and durable covering for greenhouses. Both corrugated and 8mm twinwall options use the Stuppy aluminum extrusion system to attach to the structure. In areas that require little to no heat, we recommend corrugated polycarbonate which is designed to lap over the next panel. The 8mm twinwall has about twice as much heat retention than corrugated polycarbonate, and it uses our double cap and single cap for joining panels and trim. Both styles are available in clear, opal (white), or diffused. Protected by a 15-year warranty for yellowing and a 5-year warranty for hail. Life expectancy 20+ years.

Multi-Wall Acrylic

Offered in UV absorbing or UV transmitting material for a wide variety of high light growing environments, 16mm multi-wall acrylic is a long-lasting, high-light covering. Light transmission is up to 91% PAR full spectrum. Life expectancy 20+ years.

Pro-Panel Corrugated Metal

Corrugated metal is offered in many colors and used on head houses and teaching spaces, and on the roof, sidewalls and endwalls of a greenhouse structure.



Acrylic is a great choice that doesn't yellow and is more durable than glass. It comes with a robust aluminum glazing system, and it is backed up by 10-year warranties for yellowing and hail.



SHADE SYSTEMS

Interior Shade Systems

An interior automated shade/energy curtain system is available with our CS3 model greenhouse frame, providing many benefits for schools. This is a motorized system with controls that operate the shade curtain based on light level or temperature. Most systems follow the roof line and are provided as a slope-flats-slope configuration to allow for extra clearance. The shade/energy curtain reduces energy consumption by up to 30% to 40%, depending on cloth type, by closing at night to conserve energy and reduce heat loss. The system controls light levels with shade fabrics that range from 15% to 70%.



Exterior Shade Cloth

Over-the-roof coverings provide an alternative, with either a black or a heat-reflecting white or aluminum shade cloth. The over the roof is available in black (woven or knitted) with tape and grommets sized for the greenhouse roof. The shade cloth must be manually installed when needed, which can prove challenging for teachers and students.



Standard Equipment

Exhaust Fans & Inlet Shutters

Aluminum exhaust fans offer the added benefit of greater longevity. Fans include a belt tensioner to maintain belt tightness and both inlet and outlet guards. Fans are available in 1- and 2-speed versions. We typically have a smaller upper gable exhaust fan for low-volume winter ventilation. Life expectancy is 30+ years.

Personnel Doors

ADA handicap approved for the educational market, there are several door options. Steel insulated, single doors are 42" and double doors are two – each 42" x 6'8". We include a lever lockset, which includes a heavy-duty door closer (Taco) to prevent door slam for safety, and 22" x 22" VueLite single pane tempered glass window. Custom locksets to match school locksets can be furnished at an extra cost.



Evaporative Cooling System

Our open-top 6" PVC evaporative cooling system is supplied with a self-contained reservoir, eliminating the need for an external tank and making maintenance easy.

Door options include:

- Panic bar/touch bar for exit
- Rollup door for large equipment entry



Rigid Vent System

The sidewall or endwall rigid vent systems come with a long-lasting Wadsworth vent motor (UL approved). This system includes a motor control box to allow manual or automatic operation and has a life expectancy of 20+ years with minimal maintenance required. Available heights are 2', 3', 4', 5' and 6'.



Controllers

Several types of control systems are available, depending on the equipment that is being controlled and features that are needed. Typical control is based on temperature and humidity. Upgraded controls are needed for light level control (interior shade/energy curtain or grow lights), alarm systems, and web or remote interface. Our team will recommend a control system for your needs.

Heating

A stainless-steel heat exchanger is recommended for the greenhouse environment. Heaters are power vented with spark ignition and include a 15-year warranty. Low-profile, separated combustion, and high efficiency models are options. Hydronic Bench Heat is also available. See page 13 for more details.



Optional Equipment

STANDARD OPTIONS

Irrigation

Offering precision in an easy-to-use design, our irrigation systems are designed for the educational market. All parts necessary for a complete system are included; filters, pressure regulator, fertilizer injector, 24v solenoid valves, irrigation controller, propagation zone electronic leaf controller, poly tubing, poly tubing fittings, mist/sprinkler spray assemblies, dripper and hanging basket rails, plus installation drawings. PVC pipe and fittings are supplied with projects that include installation.



Benches

In-ground, above ground, stationary or rolling top benches are available. All are manufactured from galvanized steel tubing and aluminum bench top edge. 13-gauge hot-dipped, galvanized expanded metal is another common material. Both bench tops provide excellent air movement for improved crop growth. Bench widths are 2', 3', 4', 5', 5'6" and 6'.

Durabench plastic bench tops are recommended with safety in mind. These plastic bench tops reduce the number of sharp points and are very long lasting.



CUSTOM OPTIONS

Roof Vent

Natural ventilation is an excellent option for winter ventilation and humidity control. Roof vents are offered as single or double vent options and include a Wadsworth VC-2000 motor (UL approved) for long life with minimal maintenance. An accordion insect screen can be added for additional control of Thrip, Aphid or Whitefly exclusion. Available width 2', 3', 4' and 5'.



Hydronic Bench Heat

Stuppy's custom Hydronic Bench Heat warms the soil with direct contact from rubber tubing radiant heat to the root zone for even control of soil temperature. Designed in-house with high-quality EPDM rubber tubing set on 2" centers. Tubing resists ozone, fertilizers, high temperatures and chemicals, offering superior heat transfer capabilities and a durable design. Tube design reduces water volume, enabling the system to respond quickly and efficiently. Ridged plastic spacers are spaced every inch to hold tube in place and can be cut to bench width of up to 8' wide.

Lighting

Horticultural lighting is an excellent choice for use in educational greenhouses, from vegetable production to propagation. Lights are available in high pressure sodium (HPS) or metal halide. The type of light needed depends on many factors: crops grown, desired light output, mounting height and crop spacing. Lights are available in many wattage and voltage. LED horticultural lighting is also available.





Growing Systems

Hydroponics

Hydroponic growing is a reliable, technology-driven method that increases efficiency while reducing crop disease and pesticide use. This method makes growing easy by economizing space and offering flexibility, while maximizing quality and yield, so it is perfect for a smaller greenhouse classroom. If you are looking to create the ideal nutrient environment where students can work together to elevate crop quality consider one of our stand-alone Hydroponic Systems including Nutrient Film Technique (NFT), Bucket and Ebb & Flood based designs, which obtain their nutrients from soluble fertilizer compounds.

Ebb & Flood Systems

With plants immersed directly in the nutrient solution, this system is a simple and effective means of greenhouse growing. Stuppy's Ebb & Flood systems include Lifetime Technical Support, are shipped with a 75-gallon reservoir and contain all necessary plumbing and parts to get your students growing. The EF-16 and EF-32 are commonly used for growing seedlings through to finished plants, whether flowers, vegetables or fruits.

Bucket Systems

The Bucket System is the ideal system for growing vine type crops, such as tomatoes, cucumbers and peppers. This system is provided with a central reservoir and circulation pump. Each bucket has its own reservoir to provide watering between irrigation intervals. Nutrients, pH and EC can be automated with an Autogrow® dosing system.


NFT Systems

Stuppy's NFT system is engineered to grow with your program over time with modules that can be incorporated together without requiring any significant or complex alterations. The system is highly flexible, featuring an open gutter with spacing that can be tailored or removed to meet the needs of your crop.

NFT System Features

- Durable NFT systems have all PVC based irrigation and a heavy-duty steel-based frame.
- Efficient pump and pipe sizes used to minimize pressure loss and power consumption over time.
- Our growing systems employ optimal transplant spacing parameters.
- Two-piece NFT channel assembly, makes it easier to clean and harvest crops, yield more, and grow more varieties, including strawberries.
- Expandable 8.5' L NFT segments can be easily added on to each module.
- The Autogrow IntelliDose automatically adjusts nutrient/pH parameters over time and can be implemented on any size system
- For easy set-up, PVC assemblies and components are premanufactured – no tools required.
- Protected by our Lifetime Technical Support.





Growing Systems

Aquaponics

The Aqueduct, Stuppy's Aquaponic Growing System, is a small-scale aquaponic system engineered in-house for the greenhouse classroom. The basic four tank system has a 5' x 20' footprint with a 650-gallon system, supporting up to 100 plants and 50 – 75 fish. The Aqueduct is sold as a complete growing system with quick assembly that ships with all required components to operate the system, except for the fish. This includes floating rafts, media, starter seeds and a six-month supply of fish feed to quickly get your students growing. It's engineered to expand along with your program, capable of simultaneously meeting the needs of various growing environments.

A 19-week STEM Aquaponics curriculum is included with every Aqueduct. This digital format covers all aspects of aquaponics, introduces new vocabulary, poses critical thinking questions and meets NGSS standards.



Aquaponic Standard Equipment

- Tanks: fish (1), growing (2), sump (1)
- Benches (2) and all hardware
- Preassembled PVC pipe and fittings
- Expanded clay media
- Food safe, rockwool-ready float rafts
- Sheet of rockwool
- Water pump
- Air pump
- Air stones and tubing
- Water testing kit
- Six month supply of fish food
- Seeds for curriculum labs
- Aquaponics STEM curriculum
- Assembly instructions



Aquaponics Optional Equipment

- In-line heater and PVC assembly
- Grow lights
- EC meter



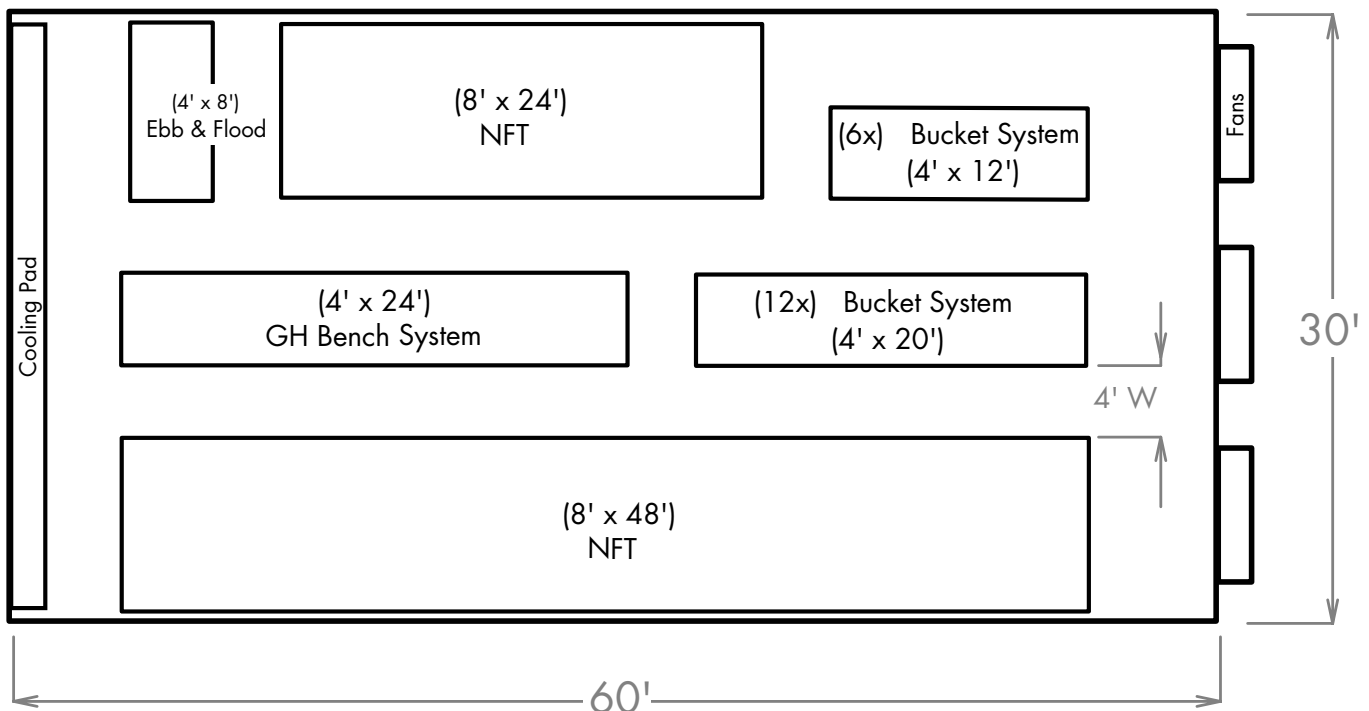
Basic Construction & Utilities

Basic Construction

The greenhouse columns will be set in concrete piers or attached via a base plate to a provided foundation. The greenhouse frame will be erected, covering will be installed along with all Stuppy provided equipment. All electrical (power and control) inside and outside of the greenhouse are excluded. All plumbing (water and gas) inside and outside of the greenhouse are excluded. Equipment start up (HVAC) is excluded. Control wiring and connections are excluded.

Greenhouse System Layout

This is an example of what a 30' x 60' educational greenhouse layout might look like, with layouts varying based on size of greenhouse. Contact your Stuppy sales representative to determine the right layout for your greenhouse.



Turnkey Construction

All included items as listed in Basic Construction. Gravel floor is provided. Power, electrical, gas and water connections are provided at non-prevailing wages (varies by project). Wiring, gas lines and plumbing will be run from equipment provided and installed by Stuppy inside and outside of the greenhouse. All control wiring will be run from control system to equipment. Final connections will be made to utilities stubbed (by owner) within 5' of the greenhouse. All prices shown are an estimate only.



Utility Connections

Electrical The installation of controller, wiring of all 115/230 volt, single-phase equipment. A minimum 100-amp breaker box will be provided along with overhead general lighting, GFCI outlets and switches, and entrance/exit lights with a battery backup.

Plumbing Installation will include a backflow preventer, hose bibs, pressure regulator and the running of water lines to sump tank. Fuel lines to a gas fired heater from source are provided.

HVAC Startup of Stuppy provided equipment is included.

Drainage Available options include concrete slab with trench or floor drains, sinks, hot water heaters, eye wash station, or potting benches. Site grading or building permits are not provided. Slab design is by others. Base plate reactions will be provided. Anything not listed above is not included.

Structure & Equipment Pricing

The following pricing guidelines can be used in the preliminary stages, such as grant writing or making presentations to your school board. We understand that budgets are a major factor; there are many variables in selecting a greenhouse that can cause the pricing to vary. The information here will help you arrive at an estimate based on the size of the greenhouse you need and your construction requirements. For more information or to get your customized quote started, contact your Stuppy sales representative.

BUDGET ESTIMATES: MATERIALS AND CONSTRUCTION

Structure Model/Size	Structure Cost	Basic*	Turnkey*	Prevailing Wages
Rainbow® Plus 30' x 48'	\$43,578	\$28,070	\$19,250	\$15,508
CS3 30' x 48'	\$48,300	\$31,500	\$19,250	\$15,508
Rainbow® Plus 30' x 60'	\$53,625	\$33,806	\$20,500	\$19,819
CS3 30' x 60'	\$62,778	\$40,250	\$20,500	\$19,819
CS3 60' (2-30') x 96' gutter connected	\$159,100	\$68,888	\$64,000	\$66,362

The above costs are progressive in nature:

Structure Cost Only

Or Structure Cost + Basic Erection

Or Structure Cost + Basic Erection + Prevailing Wages

Or Structure Cost + Basic Erection + Turnkey Construction

Or Structure Cost + Basic Erection + Turnkey Construction + Prevailing Wages

Final quote may vary depending on buyer's requirements**.

Structure Costs includes structure, 8mm covering and equipment.

Basic erection is calculated using non-prevailing wages. Includes erection of house, and installation of equipment and coverings.

Turnkey construction includes gravel floor, power/electrical, gas and water connections at non-prevailing wages. Prices are estimates based on level and graded site provided by owner, with power/electrical, gas and water utilities brought to location by others. Utilities are considered to be within ten feet.

Prevailing Wages are only an estimate. They will vary depending on location.

Lighting and Roof Vents are project dependent, call for pricing.

* Installation prices are based on being done at the same time as Basic Construction. Turnkey and Prevailing Wage requirements would be additional costs.

** Pricing does not include any applicable taxes and freight. Prices shown above are only an estimate.

BUDGET ESTIMATES: POPULAR OPTIONS (non-prevailing wage)

Structure Model/Size	Benches	Bench Installation	Motorized Interior Shade System	Interior Shade Installation	Irrigation Package	Irrigation Installation
Rainbow® Plus 30' x 48'	\$4,950	\$3,250	N/A	N/A	\$1,850	\$1,250
CS3 30' x 48'	\$4,950	\$3,250	\$5,380	\$4,800	\$1,850	\$1,250
Rainbow® Plus 30' x 60'	\$5,900	\$3,895	N/A	N/A	\$2,150	\$1,500
CS3 30' x 60'	\$5,900	\$3,895	\$5,850	\$5,100	\$2,150	\$1,500
CS3 60' (2-30') x 96' gutter connected	\$21,657	\$12,250	\$16,875	\$12,500	\$4,500	\$3,200

Final quote may vary depending on buyer's requirements.

Stuppy Mor-Space benches offer an above-ground, stationary design with plastic Durabench tops.

Exterior shade fabric is sized to fit exterior of greenhouse roof.

Irrigation package will include: fertilizer injector, filter and check valve; mist controller; watering controller; 4-zone watering system (mist, drip, table watering, and two runs of hanging basket drippers); Netafim irrigation supplies, support pipe, and hanging basket pipe.

Growing Systems Pricing

AQUAPONICS

The Aqueduct

\$5,500

The Aqueduct is a 650-gallon aquaponic growing system, supporting up to 100 plants and 75 fish, making it an ideal system for educators. It comes with a 4' x 8' media bed and a 4' x 8' float bed. Also included is our Aquaponics STEM curriculum, an excellent resource to help you teach aquaponics. Fish not included.

Aqueduct Expansions and Add-Ons

Clarifier

\$850

The clarifier option for the Aqueduct improves the system longevity and reduces overall maintenance by filtering out the solid waste produced by the fish.

Heater Package

\$950

An optional heater package for colder environments, our heater maintains the water temperature needed for optimal fish health and still allows you to reduce the temperature of your greenhouse at night for crops that require a cold period to bloom or use DIF to control plant growth.

Additional Float Bed

\$1,100

With the additional 4' x 8' float bed, you can double up on the number of deep-water raft sites you have to grow plants. Fantastic if you have a large student population or plan to supplement the school cafeteria with aquaponic produce.

Additional NFT Benches

Our first of its kind aquaponic NFT Bench adds an additional growing method to your Aqueduct system. The NFT offers expanded capability for growing plants, as well as the ability to grow aquaponic strawberries and other hanging fruits.

Aqueduct NFT36 – 4' x 4' bench assembly **\$425**

Aqueduct NFT72 – 4' x 8' bench assembly **\$800**

Fluorescent Lights

\$560 per fixture

Standard for any system that will be indoors, a minimum of three lights are needed for optimal growth rates. Agrobrite T5 648W 4' fixture with lamps.

680W LED Grow Light

\$1,100 per fixture

PHOTOBIO•MX high efficiency LED is designed for horticultural professionals looking to increase performance and yields. The high efficiency S4 spectrum provides more red, far-red, and blue wavelengths to deliver vigorous growth and optimize flower development.

HYDROPONICS

Hydroponic Bucket Systems

Stuppy's Hydroponic Bucket System is the ideal system for growing vine type crops, such as tomatoes, cucumbers and peppers. This system is provided with a central reservoir and circulation pump. Each bucket has its own reservoir to provide watering between irrigation intervals. The systems are available in various sizes to correspond with your greenhouse. Systems include a 67-gallon reservoir, pump, supply and return PVC, including all fittings, and buckets. Expanded clay media.

10 bucket system **\$755**

20 bucket system **\$1,095**

40 bucket system **\$1,400**

NFT Systems

Our NFT systems are engineered to grow with your program over time with modules that can be incorporated together without requiring any significant or complex alterations. The system is highly flexible, featuring an open gutter with spacing that can be tailored or removed to meet the needs of your crop. This is perfect for adding hydroponics to an existing greenhouse. Our open gutter system allows for flexible placement of the channels and if needed one or more channels can be removed to accommodate crops that require more space. 20-gallon reservoir.

NFT 36 – 4' x 4' bench with reservoir **\$750**

NFT 72 – 4' x 8' bench with reservoir **\$1,125**

NFT 264 – 12' x 8' bench with reservoir **\$3,220**

Ebb & Flood Systems

With plants immersed directly in the nutrient solution, this system is a simple and effective means of greenhouse growing. Our Ebb & Flood systems feature a 36" steel bench. Perfect for installation in an existing greenhouse, the system is shipped with a 67-gallon reservoir and contains all necessary plumbing and parts to get your plants growing. The EF-16 and EF-32 are commonly used for growing seedlings through to finished plants, whether flowers, vegetables or fruits.

Ebb & Flood 16 – 4' x 4' **\$550**

Ebb & Flood 32 – 4' x 8' **\$1,000**

Lighting Options

Various lighting options are available. Contact your Stuppy sales representative for more information.

* Prices subject to change.



Good to know.

Stuppy
GREENHOUSE

800-733-5025 greenhouse@stuppy.com www.stuppy.com