

FIELD PROJECT
GREEN HOUSE AND INDOOR GARDENING

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Introduction

Greenhouse and indoor gardening play a vital role in horticulture. A green house is also called a glass house. It is a structure with walls and roof made chiefly of transparent material, such as glass, in which plants requiring regulated climate conditions are grown. Many commercial glass greenhouses or hothouses are high tech production facilities for vegetables or flowers.

Indoor gardening is a process of creating an artificial garden environment inside a house. It is beneficial for those living in homes or apartments where there is no room to garden. It's also perfect for gardeners who would still like to have fresh produce during the cold winter months.

Green House

A greenhouse (also called a glass house) is a structure with walls and roof made chiefly of transparent material, such as glass in which plants requiring regulated climate conditions are grown. These structures range in size from small sheds to industrial sized buildings. A miniature greenhouse is known as a cold frame. The interior of a greenhouse exposed to sunlight becomes significantly warmer than the external ambient temperature, protecting it's content in cold weather.

Many commercial glass greenhouses or hothouses are high tech production facilities for vegetables or flowers. The glasse houses are filled with equipment including screening installations, heating, cooling, lighting, and may be controlled by a computer to optimize conditions for plant growth. Different techniques are then used to evaluate optimality degree to reduce production risks prior to cultivation of specific crop.

Advantages

- Good distribution of light inside the greenhouse
The greenhouse covers have the ability to change the direction of the sun's rays. Thus evenly distributed over the entire surface, benefiting the entire greenhouse and avoiding the sun's rays directly to the plant.
- Energy efficiency - Takes advantage of the environmental conditions, such as optimizing the heat inside the greenhouse.
- control of microclimate - One of the main advantage of a greenhouse is to control and establish the optimal environment for cultivation
- Protection against diseases, pests and other vermin. another advantage of a greenhouse is that it is very difficult to enter as it is a closed space
- Excellent ventilation - You can ventilate the greenhouse, quickly, thanks to their zenithal or side windows
- increased production - This is a great advantage of greenhouse, can intensify production due to weather conditions. can accelerate the growth of the plants and also allows a greater amount of crop on the surface

- production off season
- production in regions with adverse weather conditions.
- optimize the use of other technologies to facilitate the management of climate (heating humidification, shade screens or saving energy, etc)
- optimum sealing against rain and air.

Building a Greenhouse in 10 Easy Steps

1. choose the greenhouse style/frame

At Rimol greenhouse systems, we offer a variety of different styles and sizes of greenhouse structures to meet your needs. This step is one of the most critical steps in the building a greenhouse, and can determine the functionality and effectiveness of your entire operation. Each greenhouse structure is specially designed for certain application and is best utilized in different ways. Study the description of each type of greenhouse in our greenhouse series pages to decide which structure and package will best meet your needs and budget, and use our guide to selecting a greenhouse to make your final decision. If you have further questions, or cannot decide what type of structure you would like, call us and our greenhouse technicians will assist you in planning your greenhouse project.

2. Doors and Hardware

when looking at how to build a greenhouse, your Rimol greenhouse structure needs entry and exit ways that are both functional and fits with the specific look that you are trying to achieve. With our many door options in a variety of different colors and sizes, you are sure to find precisely what you are looking for. Our quality doors are guaranteed to last you a long time, and are well insulated so heat last you a long cannot escape the greenhouse. These doors will be exactly what you need to easily access to your greenhouse at all times. Selecting the hardware that holds your structure together is another critical step in building a greenhouse. You must sure that your greenhouse plans include the proper nuts, bolts and brackets so your structure will be as strong as possible under even the harshest weather conditions support your greenhouse with all kinds of hardware from Rimol greenhouse systems.

3. choose Your covering

choosing the proper covering is a key step in creating an effective growing environment in your greenhouse structure. Rimol green houses offers a variety of coverings in different materials and thicknesses to ensure that you have options to select the exact covering that fits your needs and budget. These coverings are strong and durable, and will not tear under harsh weather conditions such as snow and wind. you can count on coverings from Rimol green house systems to protect your greenhouse structure and last you a long time. once you have selected your covering, be sure to read our guides on installing a greenhouse covering and installing polycarbonate.

4. cooling and Ventilation

A common question when people ask how to build a greenhouse concerns greenhouse ventilation. It's imperative that you include a way to cool your greenhouse structure to keep plants from overheating. Rimol greenhouses offers a variety of cooling systems, including options for mechanical ventilation, natural ventilation, and shading. Any way that you want to cool your greenhouse, we have a number of quality products that will do exactly what you need in an effective and efficient way. Take a look at our greenhouses building options for cooling and ventilation and determine the system best for you. To select what size cooling system you will need for your greenhouse structure, read through our guide on sizing fans and shutters.

5. Select Your Heating System

Your greenhouse plans should also include proper heating for giving your plants a suitable growing environment. We offer heating options for every type of grower, including propane and natural gas heaters, oil heaters, convection tubing, hot water heaters and more. We can provide you with the materials for any greenhouse heating application that you would like. Browse through our selection of heating systems to decide which heating unit is right for your greenhouse structure, and then choose which size you need by using our guide explaining how to size a heating system.

6. Environmental controls

In order to create a functional and energy-efficient greenhouse structure, it is essential that you maintain complete control over the heating and cooling. From simple thermostat systems to more advanced computer modules, we have a wide range of environmental control options for every type of grower. These controls are easy to understand and extremely user-friendly so you never become frustrated or confused. You can depend on our systems to provide you with the service you need in order to create a proper growing environment in your greenhouse. To learn more about the benefits and features of an environmental control system, read our article about understanding environmental controls.

7. Other systems

Novices looking into how to build a greenhouse should research all the systems that go into creating a fully functional greenhouse structure. A CO₂ generator can contribute to improved growth for your plants. Installing a simple irrigation system can ensure that your plants stay properly watered at all times. There are many different systems available to help you create a thriving and efficient growing environment in a controlled setting.

8. Benching

When using your greenhouse structure for retail applications, benches are an essential part of making it function in ways suited for you. Our benches come in a variety of materials, styles, and sizes, so that you can choose exactly which benches you would like. Made of strong galvanized steel, these benches are sure to last you a long time. We can make virtually any custom bench, so call us and we will help you design the benches that you would like.

9. Order Your Greenhouse

once you have finalized your greenhouse plans, as well as any additional accessories; it is time to order your greenhouse structure. Fill out one of our quote request forms, and read through our terms and conditions to be sure that you fully understand the ordering process. Once you send us your order, we will have it shipped directly to you as soon as possible.

10. Build Your Greenhouse

Finally, after selecting all of the equipment that will make up your greenhouse, you must build the structure. While this may seem like a daunting task, Rimol Greenhouse Systems has numerous instructions manuals and fact sheet that can help you construct your greenhouse without a problem. call/ox

Types of greenhouses

Wooden framed structures

In general, for the greenhouses with a span less than 6 m, wooden framed structures are used. Side posts and columns are constructed of wood without the use of a truss is commonly used as it is inexpensive and possesses the required strength. Timber locally obtainable, with good strength, durability and machinability can be used for the construction.

Pipe framed structures

Pipes are used for the construction of these greenhouses when the clear span is around 12 m. In common, the side posts, columns cross ties, and purlins are constructed using pipes. In this type of greenhouses, the trusses are not used.

Polyhouse

The polyhouse is a generally used type of greenhouse across the globe. It is prepared of the frame (usually metal) of the desired size and covered with polyethylene film. Unlike glasshouse; polyethylene will be used as the glazing material. The polyhouse type greenhouse is not recommended at all in hilly regions because of poor temperature retention, low crop, yield, and high installation cost.

Even-span greenhouse

An even-span greenhouse is a self-supporting commercial greenhouse and is the most general type of greenhouse. It is named an even-span as the distance from the ridge to the eave is equal on both sides.

Lean-to greenhouse

A lean-to greenhouse is seldom used commercially and is attached to the south wall of a self-supporting structure. Lean-to greenhouses are normally used to start bulbs or seeds

Ridge-and-furrow greenhouse

Two or more even span greenhouses connected at the eaves is known as a ridge-and-furrow greenhouse. It contains supports but no inner walls dividing the greenhouses. This allows for the making of horticultural crops requiring the same growing environments.

Contiguous greenhouse

Like the ridge-and-furrow type greenhouse, a contiguous greenhouse has two or more even-span greenhouses connected at the eaves. The difference is that a contiguous greenhouse contains inner walls separating the greenhouse which allows for the production of horticultural crops need different growing environments.

Glass greenhouses

only glass type greenhouses with glass as the covering material existed prior to 1950. glass as covering material has the benefit of greater interior light intensity. These greenhouses have a higher air infiltration rate which leads to lower interior humidity and improved diseases prevention.

Truss framed structures

If the greenhouse span is great than or equal to 15 meters, truss frames are used. Flat steel, tubular steel or angular iron is welded joints to form a truss encompassing rafters, chords and struts, struts are supporting members under compression and chords are maintaining members under tension. Angle iron purlins running during the length of the greenhouse are bolted to each truss. columns are used in very wide truss frame houses of 21.3 m or more. Most of the glass houses are of truss frame type, as these frames are best suitable for pre-fabrication

Plastic film greenhouses

Flexible plastic films, including polyethylene, Polyester and polyvinyl chloride are used as covering material in this kind of greenhouses. Plastic as covering material for greenhouses have become popular, as they are cheap and the cost of heating is less when compared to glass type greenhouses. The major disadvantage of plastic films is it's short life. for example the best quality ultraviolet (UV) stabilized film can last for 4 years only.

Rigid panel greenhouses

Fiberglass-reinforced plastic and polycarbonate rigid panels are employed as the covering material in the Quonset variety frames or ridge and furrow type frame. Very high-grade panels have a long life even up to 20 years. The major disadvantage is that these panels tend to collect dust as well as to harbor algae, which results in a darkening of the panels and subsequent reduction in the light transmission. There is an important danger of fire hazard.

Indoor Gardening

Definition

Indoor gardening is nothing more than the act of growing plants indoors. The might be at a residential home, within a business location like an office building or restaurant, or any other enclosed area. There are multiple types of indoor gardening, including contained gardening hydroponic gardening, controlled environment agriculture, vertical farms and more.

Work of Greenhouse Artificial Heat

If adding more thermal mass to the greenhouse isn't an option, you can always resort to putting in an artificial heat source such as a space heater. Ideally, you'd want a heat source that you can link to a thermostat so that it automatically keep the temperature inside within the desired range. Greenhouse supply stores carry many types of artificial heaters designed specifically for use in greenhouses.

Thermal Mass

Different materials take different amount of energy to heat up, a characteristic known as thermal mass. The higher a material's density is, the more energy it takes to raise the temperature of that material. Thus, high-density materials such as stone, brick, concrete and even water can store a lot of heat energy. Adding these materials to your greenhouse means that it will take longer for the building to heat up during the day because heat energy gets trapped inside the high-density materials; however, during the night, all that extra heat energy will slowly be released into the air after the sun goes down.

~~Artificial heat~~

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Environmental Factors Affecting plant Growth

Environmental factors that affect plant growth include light, temperature, water, humidity and nutrition. It is important to understand how these factors affect plant growth and development

Light

Three principal characteristics of light affect plant growth: quantity, quality and duration

Light quantity refers to the intensity or concentration of sunlight. It varies with the seasons. The maximum amount of light is present in summer, and the minimum is winter. Light quality refers to the color of light. Sunlight supplies the complete range of wave lengths and can be broken up by a prism into bands of red, orange, yellow, green, blue, indigo and violet. duration, or photoperiod refers to the amount of time a plant is exposed to light. photoperiod controls flowering in many plants. scientists thought the length of light period triggered flowering and other responses within plants.

Temperature

Temperature influences most plant processes including photosynthesis, transpiration, respiration, germination, and flowering. As temperature increases, photosynthesis, transpiration and respiration increase. When combined with day-length, temperature also affects the change from vegetative to reproductive growth. Depending on the situation and the species of plant, the effect of temperature can either speed up or slow down this transition.

Water and Humidity

Most growing plants contain about 90 percent water. Water plays many roles in plants. It is

- * A primary component in photosynthesis and respiration
- * Responsible for turgor pressure in cells.
- * A solvent for minerals and carbohydrates moving through the plant.
- * Responsible for cooling leaves as it evaporates from leaf tissue during transpiration.

- * A regulator of stomatal opening and closing thus controlling transpiration and, to some degree, photosynthesis
- * The source of pressure to move roots through the soil

Nutrition

Plant nutrition often is confused with fertilization, plant nutrition refers to a plant's need for and use of basic chemical elements. Fertilization is the term used when these materials are added to the environment around a plant. A lot must happen before a chemical element in a fertilizer can be used by a plant. Plants need 17 elements for normal growth, six soil elements are called macronutrients.

Selection of plants

1. The Right plants : space

What plants should you choose? First, let common sense be your guide. In a smaller home or apartment, you probably don't have room for a big palm tree. But an African violet produces colorful blooms, is easy to maintain, and takes up little space.

2. select plants for your light conditions

If your house doesn't get much light, you may still be able to grow house plants that don't require a lot of natural light. Try growing pothos, heart leaf philodendron, snake plant or Chinese evergreen.

3. Get inspiration

If you see a plant you like in someone's home ask them what it is and what it needs to grow along with where it was purchased for other ideas, just visit your local nursery or garden center, browse Pinterest surf the internet or simply pick up a book at the library. Florists often sell houseplants and are knowledgeable sources who can help match plants to your specific condition.

4. Decorate

Houseplants aren't just green. African violet, cyclamen, poinsettias and azaleas are a few plants that provide color during dreary winter and early glorious shades of red, yellow and orange year round. There are plenty of options for adding a little vibrant color to your home.

5. Select Decorative plant containers

Mix up containers sizes, colors and material, like copper pots, ceramic glazed pots or lined wicker-style pots and don't forget plant stands, shelves and other decorating ideas to help add some space to your indoors.

Components

1. Moisture: The moisture of the plant is related to hydration of the soil which is achieved by simply watering the plant. Here, you must take care not to commit the mistake of overwatering or under watering. Use the finger dip method to check moisture before watering. Watering a plant by the calendar is not recommended.
2. Light: This is another major factor required for plant photosynthesis. This can be achieved by two methods. a) Natural sunlight - like placing your plants in your balcony or near a window or under indirect bright light in a bright spot in your home. b). Grow Light. This is obviously an artificial source of light for plant photosynthesis.
3. Soil: For house plants to thrive successfully indoors, special care needs to be taken of the kind of soil they are planted in. The soil used for houseplants is different from the natural soil that plants usually thrive in outdoors.

4. fertilizers: Natural outdoor grown plants receive nutrients from the ground soil. However potted plants have to be faceded regularly to meet the plant requirements and sustain growth and yield. This includes the major NPK elements required for proper plant performance.
5. containers: choosing the right container for indoor gardening is not so much important except using the right size for a particular plant you can use plastic, cement, ceramic or even wooden container for indoor planting. Plastic is commonly used as the its relatively cheaper and light weight. make sure you have drainage holes and lower the holes with a mesh at the bottom and also create plate under the container.
6. other factors: other important factors like Humidity, temperature, air circulation support are also important factors to take care in indoor gardening variations in these factors can be responsible for leaf drying, leaf drop, fungus and many other problems.

Conclusion

The present assignment deals with the advantages, Types, construction, working of green house and selection of plants, Important components, Environmental factors affecting indoor gardening. A green house is also called glass house or hothouses. Indoor gardening is a process of creating an artificial garden environment inside a house. Green house is a structure with walls and roof made chiefly of transparent material.

Bibliography

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