



Greenhouse Structure Maintenance

GREENHOUSES ARE UNIQUE STRUCTURES

As such, they require unique maintenance and care. The intended purpose of an Agra Tech greenhouse is to provide an enclosed environment in which intensive agricultural growing practices take place. They are lightweight structures designed for maximum light penetration with a constantly maintained interior temperature of 50 degrees F. or more during winter months and a covering that will allow heated internal air to assist in melting the snow off the roof. Agra Tech greenhouses have been designed, engineered and manufactured to meet industry and building code standards. We are not aware of the conditions at your site or the use to which you plan to put your building.

UNDERSTAND YOUR BUILDING SITE

The conditions at your site determine your structural requirements. You are responsible to specify those conditions and to select the proper structure. Do not underestimate the forces of nature at your site. It is wiser to over-build and survive an extreme condition than to under-build and build again.

WIND:

In high wind areas a wind buffer can help protect the structure. Your greenhouse is not engineered for extreme wind conditions such as tornadoes, or hurricanes. Cutting the poly off the roof may save part of your investment before high winds, or a hurricane or tornado hits.

Close all vents and doors in windy conditions. Agra Tech greenhouses that meet the International Building Code (IBC) are engineered as totally enclosed structures. Leaving one sidewall or endwall open in windy conditions can increase the wind's effect on the structure by three times or more. A weather station can signal automated vents and walls to close or can sound an alarm before winds reach a level that can cause damage.

SNOW AND ICE:

Snow and ice must not be allowed to accumulate on a greenhouse roof or in the gutter. In snow areas we recommend the installation of a gutter heating system and that it is turned on before snow accumulates. If you have a curtain system, open it before snow accumulates so interior heating can assist in melting the snow. If snow or ice does begin to accumulate, remove it immediately. Non-growing structures require special attention to prevent snow accumulation because they might be insulated or not heated.

RUST & CORROSION:

The greenhouse can be the perfect environment for the growth of rust. Consistent moisture and trapped moisture are leading causes of rust. Dust contributes to rust as it lowers the PH of the water and surfaced water mixed with dust does not runoff as fast. Acidic moisture (or moisture with a low PH) also causes rust. Acidic environment is caused by many of the chemicals and systems used inside the greenhouse:

- Sulfur Dioxide mixes with moisture to create Sulfuric Acid in the condensation that runs off the inside of the glazing.
- Copper sulfate (copper that has been dissolved in sulfuric acid) is used as an algacide. It corrodes metal surfaces 50 times faster than potash, ammonia, and phosphates.
- Misting systems that use reverse osmosis filters can lower the PH of the water to a point that it becomes acidic. This combined with a consistently moist environment can be very destructive to the greenhouse structure.
- Inadequately vented or poorly maintained heaters release corrosive vapors.

Greenhouses located close to the ocean may require special care to prevent premature rust caused by airborne salts.



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RUST & CORROSION(cont):

Imbalance of air circulation systems, venting, and heating can cause high humidity that can be damaging to the structure as well as create pockets of disease-producing high humidity on the plants. Galvanization and zinc plating do not guarantee against rust, they only slow the process down. As seen in the example above, certain situations can accelerate the rusting process by as much as 50 times. (50 years worth of corrosion in one year!)

A well-managed greenhouse will not rust to the point of structural damage. Keep the gutters free of accumulation of leaves and other debris. Check for leaks under cooling pad systems, notorious areas for rust. Make sure there is adequate drainage so that the columns are not subjected to standing water. During periodic inspections of the greenhouse, any areas showing rust should be investigated as to the cause and the cause should be remedied. The steel should be cleaned and protected by a spray-on galvanized coating or a tar-like maintenance coating.

GREENHOUSE COVERINGS:

In general, before applying cleaning solutions, paints, or sealants, or before introducing new chemicals, herbicides, pesticides, fungicides, fumigants, or organic solvents into the greenhouse environment, check with the manufacturers of the coverings.

During periodic inspections, check and replace coverings showing brittleness, cracks, holes, and/or reduced light transmission. Refasten or replace panels that have come loose.

Some greenhouse coverings such as fiberglass are very flammable. While polycarbonates will not sustain a flame without an ignition source, it is wise to keep heat, fire, and flame away from all greenhouse coverings.

Poly film:

A properly inflated roof is extremely important. Over inflated poly can put a tremendous amount of stress on the greenhouse frame, enough to distort and damage the greenhouse as well as cause damage to the poly. Under inflated poly can also damage the frame as well as the poly when whipped by the wind. When poly is installed on the greenhouse with an outside temperature lower than 10C (about 50 degrees Fahrenheit), it may be necessary to stretch the film again later when the outside temperature has sufficiently increased. Static pressure between the poly layers can be measured using a manometer. Check with the manufacturer of the poly for the correct amount of pressure, usually .2 or .3 inches of water column.

Life expectancy of poly: The first factor influencing the life of the film is the thickness. The thicker the film the better it will withstand degradation. Polyethylene is attacked by UV radiation, which is why UV absorbers and UV stabilizers are added. The life of a specific poly is strongly determined by the location in which the film is used. In regions with low solar irradiation, poly will last longer. In high altitude regions, solar irradiation is higher and the lifetime of the film will be reduced. Chemicals can affect the poly. In particular, pesticides containing sulfur and/or chlorine can attack a film's stabilization systems.



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GREENHOUSE PERIODIC MAINTENANCE CHECKLIST

Remember to make frequent visual checks of the interior and exterior of your greenhouse. Doing so can prevent small problems from turning into big problems later. (If you are a grower, remind yourself to look around frequently to make a visual check of the structure you depend on to keep your crop safe.) In addition to the items mentioned above, check the following components after first month or so of initial operation and then approximately once a year.

- ✓ Bolt-together connections: Nuts that have not been adequately tightened during installation may gradually work their way loose. Retighten.
- ✓ Cable clamps should be retightened after initial load has been applied.
- ✓ Closure strips can escape the trims if not installed correctly or after time with vibration. Push closure strips back up into trims with a blunt object.
- ✓ Closure strips may deteriorate over time. Check and replace any dry or brittle closure strips.
- ✓ Drainage in and around the structure.