Greenhouses

Transcript – Greenhouse Coverings

Hello and welcome to Honor's Lab, Greenhouse Construction. This is module four and today we're going to learn about the different types of coverings that you can put on your greenhouse. So, there are six main types of coverings for your greenhouse. We got glass, polycarbonate panels, fiberglass, semi-rigid covering, PVC fabric, or polyfill. So, glass is very heavy and pretty expensive, but it can last for decades. It's not good in areas that have a lot of hail. Very few greenhouses except for the decorator kind have glass for the roof anymore. Polycarbonate panels are rigid plastic panels that are made for greenhouses. They come in single wall up to triple wall and they can last a long time but are very expensive. We had some at the bottom of our solar house and after about 30 years, it just weathered. It turned yellow and the weed whacker has done a number on it. So, if I was made of money, it would be a nice choice for skinning a building, but it's one of the more expensive coverings and it is susceptible to hail damage. So, if you get big hail, polycarbonate's probably not the one for you. The new types are probably better about yellowing than the older versions, but our older ones, they yellowed pretty quickly. All right, this is one of our polycarbonate doors. This door is actually 25 years old. You can see the yellowing. This is a double-wall, quarter-inch polycarbonate. I think they're better these days and don't yellow as much, but for a door, it doesn't matter. But we will be needing to replace this at some point.

Fiberglass is another option. It's less expensive than the polycarbonate panels and it will last about 10 years before it yellows too much to let the light in for the plants. Fiberglass can withstand quite large hail. We had fiberglass on the little greenhouse and after about 30 years it was cracked in two and it was so yellow that the plants didn't grow very well. But 30 years is too long to ask the fiberglass to stay good. It was really, really nice for the first 10 years. All right, this is one of our fiberglass panels. This is 29 years old. We don't have any more fiberglass roofs anymore. This is a sidewall. As you can see it is yellowed, but we still have the integrity, and this will probably stay up until it falls apart. But fiberglass can last a long time, but it does get the yellowing after about 10 years.

Okay, next is the solar wrap and the Solexx and these are the new type of coverings for greenhouses. They're still a little on the expensive side and they do offer some insulative value. They are a semi-rigid cover and I have not experienced either product yet, but this material does pretty good in areas that do get hail. The PVC fabric is another option for your greenhouse cover and we have not used it before either, but you can take a look at it and see if it would work for you and your application and it can withstand the hail.

Next is the poly film and this is what we use for all our buildings and it's what most growers use. We buy a 6-mil film that is made for greenhouses. It resists hail damage really, really well. Regular plastic not made for greenhouses does not have enough UV inhibitors to get the roof to last over one season. So, make sure you're buying greenhouse film. Most poly film covers for greenhouses are guaranteed for four years, but we leave ours on for about 10 years and then we use some of the pieces for low tunnel covers. I have some film that is over 30 years old and we are still using it around the farm for various projects. The price is low, and it works great in all weather, including the hail, and the way we do ours is we use two layers and have a blower that inflates in between the roof to give us more R-value. It really makes a big difference to have the two layers. I also think that the air bubble that we create in between the two layers protects the poly film from getting whipped about and ripped in the wind, so I'm very happy with the value that we get out of our poly film and it works great on all the greenhouses. So, we've even given away some of the old roofs for people to use in other projects and it's completely recyclable. So, this is the roof cover of choice for all my buildings. All right, this is one of our poly roofs. This is a double layer, so there's 6-mil plastic on the inside, 6-mil on the outside, just fits over the

bows, and then we have an air blower that blows air in between and it does a really, really good job for our greenhouses.

Next, let's talk about end walls. The roof cover goes over the top, but we need to cover the end walls too. So, the end walls can be solid or made out of the same material as the roof. Okay, this is our building, the Odyssey, and this is a high tunnel. And the end wall on this one, this is a single poly plastic, 6-mil and then this is just a regular screen door that you can get at the hardware store. And the way that this is attached is there is a channel with wiggle wire in it and it just goes all the way around the edge of the door and all the way around the top. The one thing that I don't like about this is it's easy for us to put holes in the plastic because it comes clear to the ground, but it makes a good clean end wall and it's really fast and easy to put up and the expense for this one is really low.

All right, we're here at the little greenhouse and this is one of our new roofs that we just put on a couple years ago and this is a double poly. You can see the air pocket in there. It's about -- oh, it's a good eight inches thick and this is also put on with the wiggle wire here. This is the channel and then you just wiggle this wire in; it's the neatest system ever for putting on the poly, but this give us insulative value as well as keeping the bugs, the weather, and everything out and keeping this contained. All right, so the little greenhouse also has a solid wall. This one is oriented with the end walls on the east/west and so our poly bubble is just on the south side and then the north side is solid. So, we've got a solid roof, we have a solid wall, solid wall in the back and that gives us insulative value as well. It's a really good way to construct a pit greenhouse which this is or the solar greenhouses. So, our end wall on the little greenhouse is half solid and half poly with a double -- I call a double bubble.

All right, this is our big house. This is the end wall here. What we have is a three-foot stem wall with foam insulation so this thing is solid and then on top of that we have fiberglass and it goes all the way up to the roof where they meet and we got the channel up there to lock it together. So, this wall is 29 years old; been here a really long time. It is starting to peel a little bit, but we still got good integrity and it's an end wall, so I'm not as worried about light coming through it. So, it'll stay here for a while.

So after experiencing several end walls, the ideal end wall I would build for my greenhouses would be insulated, waterproof wall up three or four feet, a double poly or a solar wrap or polycarbonate for the top and would have an insulated door that's sealed. So, in order to get our buildings completely sealed up, we need to talk about the side walls. So, you'll need to decide how far down the roof will come to the ground. The roof cover can come all the way to the ground, or you can have the side walls up. So, let's look at the sidewalls that I have, and I will share with you my experiences of each one.

Okay, we're here at the Odyssey. This is our high tunnel. This is more of three-season than a four-season greenhouse and I really, really like these sidewalls for the three-season greenhouse. In the wintertime, we'll get snow loads clear up to here and it just kind of makes an insulated igloo out of this entire building, but these sidewalls are great. You just crank the handle and it rolls up from one end to the other. It does a really, really good job. The only part that I don't like about it is the wind flaps open the ends, so I have to tape it shut in the wintertime to keep the air from going in the ends, but this is a really nice way to do it. There's just a wiggle wire channel here and then this is just an extension of the roof coming on down. It is susceptible to getting holes in it, but when it's rolled up all summer, it's fairly protected in the winter. It's covered with snow up to here. So, we haven't had too many problems with it.

This is the solar house, and this is a custom flap system that we made for it. Originally this building had the blow-up sides and what we found out is when the power went out, the blow-up sides deflated and that's when we needed the sides up the most was in a storm. That's why the power went out, so we didn't like that system at all. We completely took it out and put in these flaps. So, the flaps are just put on a hinge. They just open up here and we just have a piece of rebar here that holds it open for as long as we want and then we can shut it down when the weather gets bad or in the wintertime. We also get a good snow load on this one. The snow will slide off and we'll be buried. This entire panel will be buried all winter. So, we get good insulation on the walls in the wintertime with the snow.

All right, so here's one of the things that I don't like about the sidewalls that come all the way to the ground is you tend to get holes in it. This is one of our sheep pastures and I'm sure we had a lamb put a foot through the wall. So, I want to introduce you to Poly Patch, and it is a really wide tape that you can use to patch these holes. Pretty necessary when your sidewalls come all the way to the ground. So, first thing we did is we washed this and dried it and then we are going to just patch that up over the top. You want to rub that down to where it sticks really good. I got another little hole here. So each fall I go through the greenhouses and I look for any holes that we have gotten in the poly and we get that all patched up, so that we got good inflation through the wintertime and we get good insulation.

All right, we are inside the little greenhouse. This orientation -- this is my north wall, my south wall's where the sun comes in. Because we're in a pit greenhouse, the north wall can be solid. This is 16 inches of rammed earth with cement pillars in between; this thing is solid. Its job is to collect heat during the day and radiate that out at night. It's just a huge thermal mass for this building. Okay, we're still in the little greenhouse. This is my south wall and this wall is a double poly film. It doesn't need to have any vents or flaps or openings because this building opens on the east/west and we vent on the east/west axis instead of the north/south, so the south wall is solid. The plastic in the north wall is solid with the rammed earth.

So now it's decision time for you. Your next greenhouse decisions will be what type of roof do you want or what can you afford? Do you want your sidewalls to come all the way to the ground or do you want some solid walls? And what material do you want your end walls to be made out of? So, your homework for this module is to visit a few local greenhouses and take a look at their coverings and ask them what they like and dislike about them. Ask them what they would do different next time. The local greenhouse operators will know what works best in your location. So, this is the end of module four and in module five, we are going to explore what types of heat systems will be best for your situation. We'll see you there.