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SOLUTIONS FOR SUSTAINABLE LIVING

PLANNING A POLYTUNNEL

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Mark Smith discusses the advantages of the 'must have' polytunnel for the permaculture gardener.

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The polytunnel has almost become a badge of honour for the permaculturist, no self-respecting PC-person would be seen without one. After many years with only a 1.8 x 1.2m (6 x 4ft) greenhouse sited, in a shady part of the garden that was also a frost hollow, the opportunity to have a polytunnel appeared when we moved to our new location. As usual my enthusiasm over-came my lack of knowledge but somehow I muddled through. Rather than having to re-invent the wheel I thought I would pass on my experiences in the hope that you won't make the same mistakes I did!

Do I Need A Polytunnel?
It's first worth asking yourself why do I need a polytunnel? I have talked to many people who really want a greenhouse but think the cheaper polytunnel is better value. Lets be honest. Who wouldn't like a large south-facing glasshouse sited against a warm brick wall? Even such a glasshouse has its pros and cons as does the polytunnel. So what is the polytunnel really good at doing? The polytunnel can:

- Increase the length of the growing season, allowing crops that are difficult or impossible to grow outdoors to be included in the permaculture garden. For example, in the UK, aubergines, okra and peppers.
- Provide better growing conditions. A good example is tomatoes. In a good year these ripen outdoors but are generally much more reliable in a polytunnel and provide high yields of ripe fruit.
- Provide a winter growing season. This I believe is one of the most valuable uses of the polytunnel and with the correct crops can provide vegetables virtually throughout the year.

Location
Your polytunnel should be an integral part of your permaculture system. In terms of zones*, the tunnel fits firmly into Zone 1 due to the frequency of visits required and the complexity of the work. Key factors in placing the polytunnel within Zone 1 are sun, temperature and wind. Wind is the easiest to deal with. If you build your polytunnel correctly it will not be structurally affected by the wind, with the exception of tornados. It is however practical to have it somewhere sheltered from the wind, thus reducing heat loss and in turn increasing yields. In Cambridgeshire where I live, we are open to the cold east winds so I situated the polytunnel on a sheltered side of the garden. Clearly the use of windbreaks in the wider context of the whole plot is the best solution.
More important is to get the maximum sunlight to the polytunnel. Placing the long axis east-west is optimum. However, this does lead to a dilemma in the middle of summer when you really could do with some shading due to high temperatures. What I have done is place the polytunnel so that in summer a nearby tree provides some shade around noon time and prevents scorching. During the rest of the day the shadow doesn't cover the tunnel and the amount of sunlight is maximised. As the tree is a silver birch, in the winter – when you need all the sunlight you can get – it doesn't shade the tunnel at all. If you don't have such an arrangement you will have to be very careful about keeping temperatures down in summer and providing shading by other means – either artificial or natural. Place the tunnel to avoid frost hollows!
Do not forget access when locating your polytunnel. Not only will you need access to the doors but you will need to clean the polytunnel from time to time and thus access around the tunnel is helpful. Also covers will have to be replaced sometime in the future. Plan the services you might need in the polytunnel, is it close to a water supply and do you need electricity for heating or lighting?

- Provide an environment for growing and propagating rare species. For example, I am growing the Purple Flowering Broad Beans I got from HDRA. If planted outside they would cross with other varieties. The hope is that next year I can swap over completely to this old and beautiful variety.

Polytunnels are not ideal for seed raising or as a hot house for keeping plants frost free over-winter. Heat loss through the polythene is much worse than through the glass in a greenhouse. Therefore, if you are of the dabbling kind who likes to potter about raising a few exotics and the odd tomato plant or are constrained by the looks then please go for the greenhouse – you will never be satisfied with the polytunnel.

Buying A Polytunnel

So having decided that it really is a polytunnel you want, the next thing to decide on is the type. Lets start with the shape. There are essentially two types. The first has a cross-section that is a continuous arc and is by far the most common. The second type has straight sides and arcs across the top. The latter clearly gives better access to the sides of the polytunnel. In the continuous arc case the height at the sides is low and there is often the danger of puncturing the covering when, for example, putting canes in to the ground to support crops. On the other hand, the straight-sided polytunnels are more expensive and from an engineering point of view would seem to me to be weaker. It really comes down to personal preference, I have a standard 'arc' polytunnel and find the lack of straight sides no real inconvenience.

There are two ways of holding polytunnels down. The first consists of planting the support structure and then burying the covering in a trench. The strength of the polytunnel and the tightness of the cover relies on how well you dig the cover into the ground. I think trying to get the tensioning correct by this method is difficult, although it is the most commonly used. The alter-native is to use a system that has side rails. In this case, the structure uses plates buried in the ground to prevent it from moving and the covering is attached to a wooden frame that slides up and down the main structural frame. Tensioning is achieved by pulling the frame down and bolting it in place. I found the frame system really easy to use and much less work, but it is more expensive.

Covers come in many variations and it is important to choose the correct type. Most manufacturers offer a basic polythene cover – it should transmit about 90% of the light and provide some level of light diffusion. Ideally the cover should be at least 180 microns thick.

More specialist covers include ones known as Politherm AF and Luminance THB and THB AF. These provide greater transmission of light (up to 97%), better heat dissipation through the tunnel and condensation control. The latter means that you avoid the irritating droplets that form on the inside of the cover which rain down on you and may cause fungal disease in the plants. One further advantage of the Luminance THB AF covering is that it has an infrared coating on the inside of the cover that reduces radiated heat loss thus keeping the tunnel warmer.

Details on covering can be found on manufacturers' websites (see references). If in doubt stick to the basic polythene cover. Use hotspot tape to protect the cover where it touches the structure or its lifetime will be greatly reduced.

Access doors are one of those things that we all forget about until it's too late. Make sure that you have enough and that you can get to them easily in any kind of weather. Check that the doors are big enough to get a wheelbarrow through! Some of the doors advertised by manufacturers are way too small – if your polytunnel is wide enough consider at least one set of double doors.

Ventilation

One of the things to think about very early in your polytunnel choice is ventilation. Even with good ventilation the summer temperatures can reach in excess of 38ºC (100ºF). I am sure many of you saw the TV small-holder, Hugh Fearnley-Whittingstall, using his polytunnel as a sauna. I must admit to having felt like I was in a sauna from time to time, although unlike Hugh I keep my clothes on to avoid scaring the neighbours.

The most common way to ventilate is through the doors at the ends. The area for ventilation however is often inadequate. On more than one occasion I have had to spray water on the inside to reduce the temperature or provide additional shade. In future I would go for a

Assembly

Assembling your polytunnel is rather like assembling flat-pack furniture – it should be easy but can be frustrating. I would ask your proposed supplier to send you a copy of the instructions before ordering to check they are easy to use – look for ones that show real pictures of assembly and are not all text. Check the parts you receive matches the parts list – it took me ages to realise that a piece was missing and I spent a whole afternoon trying to figure out how to assemble one part of the structure.

You will need help! Two people are about the minimum for the structure and a third could be useful for the cover. Do not try and put the cover on when there is any wind or you will either rip the cover or else end up with it sailing down the road. A hot day is good as the heat will soften the material, allowing a tighter fit. This will increase both the strength of the structure and the life span of the cover. Remember to put the cover on the right side up (yes, there is an outside and an inside to many types of cover) – having to remove a cover and replace it cannot be much fun.

Polytunnel Care

Cleaning is best done once a year. I use a biodegradable washing up liquid and a long handled mop and hose. Repairing holes in the tunnel can be done with repair kits available from the manufacturer although personally I would not bother for small holes and if necessary use any tape you have handy.

Growing In The Polytunnel

Watering is absolutely essential, especially in the summer where you may need to water daily. I use a series of soaker hoses pegged to the ground. These not only get the water to the right place but helps avoid Phytophthora fungus, which can cause major problems. Increased ventilation helps combat this.

Another problem in polytunnels is maintaining soil fertility from year to year. It's essential to add organic matter to the soil – I use well-composted chicken manure mixed with garden waste compost and/or leaf mould. In addition, I use a crop rotation system.

In such a limited space it can be difficult to do a proper rotation without leaving areas of the tunnel unproductive. My rotation system is based around the major summer crop, which in my case is tomato. About half of the main part of the tunnel in the summer are tomatoes with the rest given over to various types of peppers. In the small section I grow more difficult crops like okra and aubergines. Main crops are interplanted with lettuce and herbs such as basil.

The winter part of the rotation is based around crops that mature early in summer before I put the tomatoes in the ground (which are raised initially in seed trays, then pots). As I want to build fertility, I use broad beans and winter hardy peas – these I get to mature in about May by planting before winter. The remainder of the polytunnel in winter is taken up by crops like endive, winter radish, and other hardy greens such as lamb's lettuce. These are cropped through the winter to provide fresh greens. All the winter crops are then removed for the summer crops. I also use the polytunnel for early crops of onions and garlic. However, garlic needs a frost to produce multiple bulbs so don't grow these in a heated area. Planting is also organised so that I do not grow any crop in the same part of the polytunnel two years running.

One final factor to remember in choosing the crops is pollination. If you are growing self-pollinating crops then you need not worry. If you keep the polytunnel closed or ventilated with mesh screens then you can have pollination problems. What I normally do is treat the polytunnel as I would any other part of the permaculture environment and encourage insect life into the tunnel. In the main growing season I leave the doors open during the day (required to reduce the temperature) which means I get most insects in (even butterflies), plus blackbirds who delight in turning the place into a mess! In return I get good pollination and have so far had virtually no pests. Those that I have had, usually greenfly, I have cured using a soft soap spray.

Production

As an example of how productive my 4.25m (14ft) polytunnel can be, I can give rough figures for winter 2002 to summer 2003. During the winter season we grew around 25 endive, 10-15 large bulbs of garlic, early peas (probably around 2.2kg/5lbs picked as mangetout) and broad beans (around 4.5kg/10lbs or so). In the summer we had in excess of 54kg (120lbs) of tomatoes, around 50 green peppers and a little okra. Of course, last summer was exceptional, but I didn't get

tunnel where the sides can be raised in the summer. Typically, the ventilation holes are covered with some sort of insect screening. I have, however, resorted to leaving the doors open in midsummer and letting the insects in with no apparent harm.
During the winter the polytunnel will provide little protection from frosts. The insulating characteristics can be improved by wrapping the structure in bubble wrap. This is not only expensive but tedious and can be avoided by either growing only those crops that don't care about the temperature or by using a divided polytunnel. I have about of the tunnel divided off from the rest. This enables me to have a warm section of polytunnel in the winter for frost sensitive plants. The insulation area is much smaller and the heating requirement is reduced.
A divided polytunnel also allows me to grow plants that like different conditions in each part. I can ventilate and water differently affecting the humidity and temperature in each section. For example, aubergines like warmer conditions than tomatoes whilst both prefer less humid conditions than cucumbers.
Finally, get the biggest one you can afford or fit in – you will never have enough space!

any summer use out of the small end of the tunnel as it was used for storing some exotics.
So in conclusion I believe a polytunnel is an essential part of the permaculture garden – I hope you do too. Have fun!

Mark Smith and his wife Anne run @one Associates which offers a holistic approach to helping people gain a deeper understanding of themselves and their environment.

Contact
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Useful Resources
First Tunnels supplied my polytunnel and provided excellent service and good assembly instructions. www.firsttunnels.co.uk Clovis Lande are suppliers of polytunnels – their website has a lot of detailed information on polytunnel covers. www.clovis.co.uk

* For a good description of Zones see:
Introduction To Permaculture by Bill Mollison and Reny Mia Slay.

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