Building a Moveable High Tunnel from a Kit

In the fall of 2014, students and staff constructed three 30' by 48' moveable high tunnels on the SERP plots at the MSU Horticulture Farm. The high tunnels feature a single layer covering of greenhouse polyethylene plastic film, roll up side walls and woven plastic 'fabric' end walls with zipper closures.

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Picture 1. Before purchasing a high tunnel kit it is a good idea to ask the manufacturer for a copy of the assembly instructions. The quality of the instructions gives some insight into the ease of assembly. When your high tunnel kit arrives, take the time to take an inventory. There are many small pieces and a few specialized ones that may be difficult to source locally if you run short during construction.

Picture 2. Locate your tunnel on level ground with high quality soil. Avoid areas that are shaded, especially in the spring and fall, since the sun is at a low angle. Layout the footprint and corners of the tunnel. Use the 3-4-5 rule to get 90^{o} right angles.

Picture 3. Assemble hoops on a flat surface which will aid in having the hoop and truss assemblies square.

Picture 4. Level and compact the soil under the pipe track. Roll out landscape fabric and place the pipe track on top of the fabric. The fabric will keep the weeds down and help keep the casters out of the mud.

Picture 5. Setting the first two arches requires temporary bracing to hold the arches in place while fastening the purlins. Unlike a traditional tunnel that utilizes ground posts, moveable tunnels are not attached to the ground. With the first tunnel we used rope and ratchet straps to hold the arches in place, but it proved difficult to use. Subsequent tunnels used fixed bracing to hold the arches.

Picture 6. Note the two wooden jigs that were constructed to aid in spacing the arches on four foot centers. We built three spacing jigs and they were very helpful in the construction process.

Picture 7. Four arches are in place.

Picture 8. The arches are complete and the end wall framing is next.

Picture 9. The hip board (wooden 2X6) is attached to the frame and is positioned at the top of the roll up side wall. Tunnels without roll up side walls have this board located at the base of the hoops. The base of the poly lock is attached to the hip board. Fabric end walls are attached prior to installing the plastic film. The crew is preparing to pull the greenhouse plastic film over the hoops. A minimum crew of four is required, three to pull the strings attached to the edge of the plastic film and the fourth to keep the film flowing over the hoops. Calm and cool conditions are required for pulling greenhouse plastic film.

Picture 10. The remaining crew members lift the film so that it doesn't snag on the frame as it is being pulled.

Picture 11. Plastic film is attached to one end wall then pulled just enough to get the wrinkles out of the film. Poly lock holds the film to the greenhouse without penetrating the film. The film is attached to the hip boards with poly lock and the bottom edge of the film is attached to the roll up side wall system.

Picture 12. The completed moveable high tunnel. Casters at the base of the hoops are visible as are the stakes and straps that attempt to hold the tunnel in place. End walls are fully open and secured with straps.

Picture 13. Oat cover crop is terminated and the soil with in the tunnel has been broad forked and rototilled.

Picture 14. Two inches of compost were applied to the plots.

Picture 15. The compost was incorporated with a rototiller.

Picture 16. The first crop was planted in mid-March 2015.