

Build Your Own Underground Greenhouse

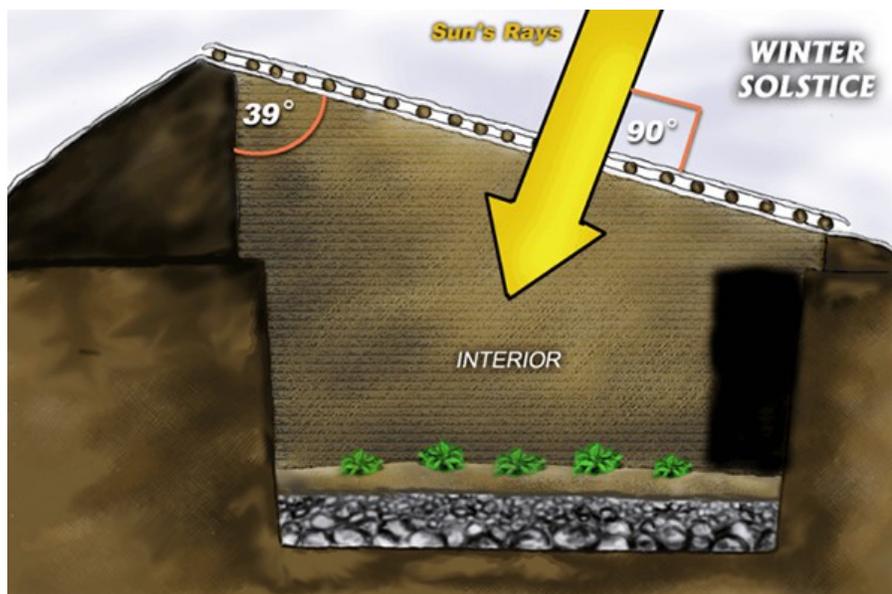
<http://www.jetsongreen.com/2014/02/build-your-own-underground-greenhouse.html>



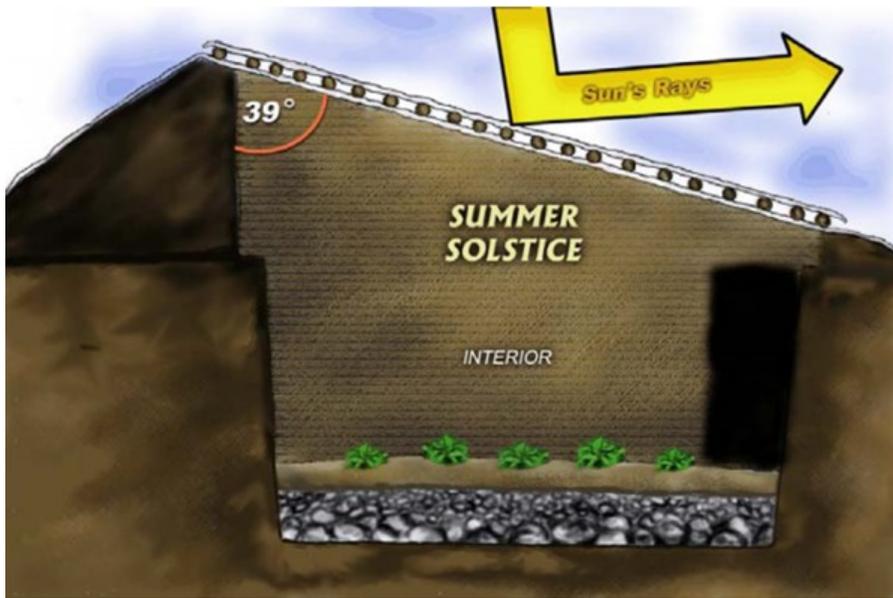
Growing food in the colder months of the year is a challenge, and growers in colder climates that want to extend the crop-growing season are always looking for a better way to do so. Greenhouses are a great option, but they cost a lot of money to construct and heat during the colder months. The American sustainable agriculture non-profit organization Benson Institute has come up with a set of easy to follow instructions on how to build a much cheaper alternative, the so-called walipini, which means “place of warmth” in Aymara Indian. The walipini is basically an underground, pit greenhouse in which it possible to grow vegetables all year, even in the

coldest regions of the world.

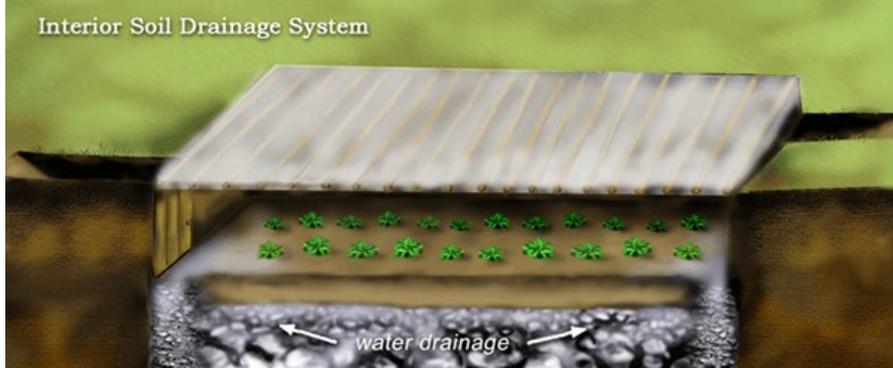
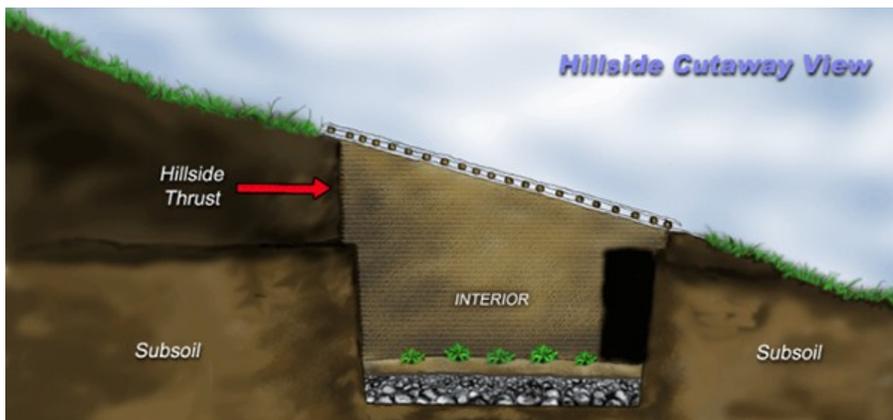
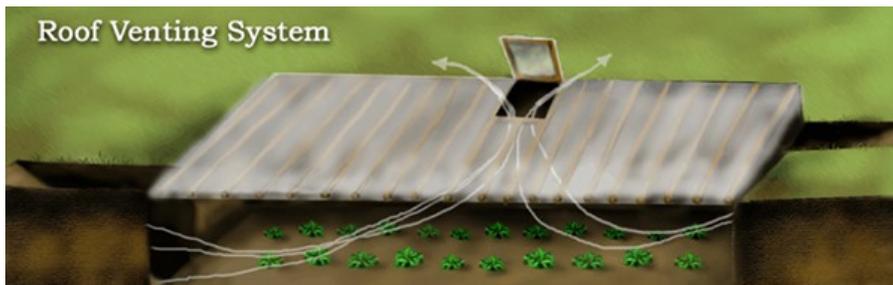
The walipini is built using the principles of earth-sheltered building and passive solar heating. The Walipini is basically a rectangular hole in the ground that should be 6 to 8 feet deep. Once the hole is dug, it should be covered by plastic sheathing. The longest side of the rectangular hole should face the winter sun, which is to the north in the Southern Hemisphere and to the south in the Northern Hemisphere. At the back of the structure, there should be a thick wall of rammed earth, while at the front there should be a much lower wall, which provides the ability to angle the plastic roof in the correct fashion.



The roof serves two functions, namely to protect the plants and to heat the greenhouse. The plastic roof is made up of two layers of plastic, namely a sheet on the top and one on the bottom of the roof/poles. It works to seal the hole in the ground, and creates an insulating airspace for the garden. In addition to that, it lets in the sun's warmth and traps it, which creates an even temperature inside the walipini and allows for successful year-round vegetable growth.



By being built underground, the walipini also takes advantage of the earth's thermal mass, meaning that a lot less energy is needed to heat up its interior compared to a conventional greenhouse. The structure must of course be waterproofed and ventilated correctly, face the sun at the right angle and have an adequate drainage system.



The Benson Institute built a 20-foot by 74-foot field model walipini in La Paz, Bolivia, which they say, cost only about \$300 to

build. The low cost is due to volunteer labor and using materials such as plastic ultraviolet (UV) protective sheeting and PVC piping, which are very affordable.