Greenhouses: Back to the Future

by Carolyn Smith

Growing plants in a controlled environment has been around at least as long as the Roman Empire. There are records of cucumber plants being housed in frames covered with oil cloth or sheets of selenite that were wheeled outside every day into the sun and back inside at night.

I have lived and gardened in many different climatic zones all over the country, and greenhouses have been invaluable everywhere. Here's why:

• Greenhouses extend the growing season by providing a protective indoor environment for seeds to germinate and plants to grow until conditions are suitable to transplant outdoors.
• Greenhouses provide plant protection from severe weather including temperature extremes, strong winds, hail, frost and snow.
• Growers are protected from the elements too!
• Greenhouses afford protection from animal and most insect predation.
• In the harshest environments, food production can be year round with the right design and set up for each season.
• There's more control over humidity levels and temperatures in both the air and soil; no more waiting for the soil to warm up and/or dry out to prepare beds for planting.
• Attached greenhouses provide heat and moisture to living spaces, creating a healthier environment and savings on heating bills.
• As lush moist oases in dry desert climes and warm green refuges in the colder northern latitudes, they feed the soul.

Even in the coldest months, Dugan enjoys his greenhouse as a sanctuary of warm, soft air and soothing greenery.

How do greenhouses work their magic? A greenhouse is constructed of transparent glass or plastic in the form of polyethylene film or multiwall sheets of polycarbonate or acrylic glass. The sun's short wavelength infrared radiation passes inside. Everything inside absorbs this radiation and warms up. This heat is then released in the form of long wavelengths, most of which cannot pass back out through the greenhouse. Heat trapped inside builds up throughout the day. Warm temperatures encourage growth and evaporate water, creating high humidity that aids in plant growth.

I have had the good fortune to work in some amazing greenhouses. My first was a small beautiful 8x12' wood and glass greenhouse in Marin County, CA. I used this greenhouse for all my flower and vegetable plant starts as well as for drying tomatoes. This greenhouse was a joy to use; especially on cold winter days. It had a gravel floor, wood slatted shelves at the perfect height and automatic vent openers regulated by indoor temperatures. As the temperature rose, wax contained in metal cylinders warmed up, expanded and pushed up pistons that opened the vent; when the wax cooled down and contracted, the piston lowered and the vent closed. So simple and no electricity was required. What a great invention!

Early September is the time to prepare and plant greenhouse beds. And there's Carolyn!

A few years after moving to Silver City, I was invited to join the Boston Hill Growers' Cooperative. Seven members, including the owner William Joseph, shared a 30x60 ft. greenhouse. Each member had 75 square feet of raised beds and was responsible for greenhouse care one day/week: opening windows and doors, watering, and bug patrol as needed. In early September, we prepared and planted our beds, mostly winter greens. The greenhouse roof collected rainwater in large outdoor tanks that filled large indoor water troughs and 50 gallon drums used for watering the beds and as heat sinks to moderate indoor temperatures. We used doors and windows for ventilation and to release excess heat and closed everything up to retain heat. There was a large gas heater, but we found that it wasn't necessary for hardy winter crops, and cooler temperatures decreased aphids. In general, larger greenhouses are more efficient as inside temperatures do not fluctuate as much. They heat up slowly during the day as heat is absorbed into the soil, floor and other heat sinks and cool down gradually as all this heat is released. For six years I harvested delicious nutritious greens from October-April! What a great model for food sustainability and community building.

Most recently, my partner Gregg Dugan and I started Two Birds Fruit. We propagate grape vines, goji berries and fig, pomegranate and quince trees. We take cuttings in November and December, put them into one gallon pots and grow them out through winter and early spring in Dugan's greenhouse space, a 3 ft. wide x 3 ft. deep x 40 ft. long raised bed located inside on the south side of his home. Dugan always reserves a couple of 3x3 ft. sections of the bed to grow greens, mostly lettuce and beet greens. We really enjoy the gifts from these plants: warm soft moist air, soothing greenery, endless entertainment watching them grow and thrive, and delicious salads and cooked greens.

Many local producers have chosen to grow all or some of their crops in greenhouses because of the many environmental challenges we face here in the southwest. Others use greenhouses for plant starts, to sell or to get a jump on the season. Preferred Produce Inc. located in Deming, NM now has 87,000 sq. ft. of greenhouse production. One of the largest complexes of greenhouses in the world is located in Almería, Andalucía, Spain and covers almost 49,000 acres!

With continued population growth and the global climate crisis, greenhouses may prove to be an essential and necessary strategy for future food production throughout the world.