Red, ripe, and ready to be picked, sliced, and eaten—a plump, perfect tomato dangles from a vine. But this particular ‘mater isn’t in somebody’s garden, but rather growing indoors in a greenhouse on the University of Tennessee Institute of Agriculture campus.

Plant Sciences graduate student Susannah Amundson likes the growing conditions here. “It’s a highly controlled system—the ventilation, the temperature, light intensity. Everything can be controlled at exactly the optimal environment for your plant,” she says.

This tomato crop is part of the Protected Agriculture program at UTIA. Here scientists are grafting tomato plants to improve yields and taste. They’re also working with other fruits and vegetables such as strawberries, blackberries, soybeans, wheat and onions. Researchers say when we protect the culture—the growing conditions, in other words—it gives farmers the advantage of producing a higher quality crop for consumers.

“There’s really two ways people can make money in protected culture. One is high volume, and the other one is high value,” says Dr. Dean Kopsell with the Protected Ag program.

Dr. Kopsell focuses much of his research in improving the nutritional value of many of the fruits and vegetables we eat. “Your grandma was right when she said to eat your vegetables,” he says. “In essence, what we’re really researching is how to make the vegetables you eat better for you. And in doing that, protected culture really lends itself well to that because as we move indoors, we now have control over all the environmental factors that a farmer would have to take for granted out in the field.”

As our population grows, we lose land for production agriculture. It stands to reason greenhouse farming will be even more critical for our future food supply. “Worldwide we’re starting to see an increase in the volume of vegetables grown in so-called protected cultures,” says UTIA plant physiologist Dr. Carl Sams.

The Protected Ag program focuses on giving farmers reliable information about crops grown in greenhouses, tunnels and other horticultural structures, where conditions stay constant. “So we’re hoping that we’ll gain either disease-resistant or superior yields or superior fruit quality from this,” says Sams.

Dr. Sams says many of the fruits and vegetables we eat now are grown in greenhouses, but in other countries. He wants some of that production to come to Tennessee. “These are high value crops that if we can develop the production systems and the technology and show the growers how to do it, there’s an opportunity for them to capture some of that market,” he says.

The flip side of that will be the expense. Greenhouse production can be costly. “When you’re going to invest in a protected culture, whether it be a greenhouse or a high tunnel, there’s more dollars invested,” Sams says. “So you have to have crops that have enough economic value to justify that expense.”

The idea of protected agriculture has been around a while, but look for a greater emphasis on it in the future. After all, you can put a greenhouse just about anywhere. UT’s Institute of Agriculture does greenhouse research throughout the state, including at its Plateau Research and Education Center in Crossville. –Chuck Denney