



WORDS
BARBARA D'AMICO

PHOTOS
COURTESY OF AGRIINNOVA

TURIN
— ITALY

ITALIAN LAND USED FOR FARMING
46.5%

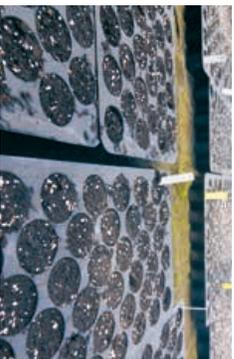
ITALIAN LAND AT RISK OF DESERTIFICATION
32%

If you want to know how plants will fare on a warming planet, send them to 2050 — Crop to the Future



AgriInnova's time-traveling 'phytotrons' simulate growing salad greens and other crops on a warmer planet.

centrations. Sensors in the air and soil monitor conditions and collect data around the clock. Maria Lodovica Gulmino heads the team at AgriInnova, the agro-environmental research center at the University of Turin. She says a decade ago, the researchers first set out to study how vineyards would hold up under climate change in Italy's Piedmont region, where the Barolo wine grape and other types are grown. Their experiment quickly expanded.



"We ended up checking what would happen to corn, vegetables, fruit, and many other crops we base our diet on today," Maria says. "And what we saw is quite curious."

Models created by the UN Intergovernmental Panel on Climate Change — the most respected voice on the subject — project that the global average temperature will rise by up to 6 °C by 2100 while CO₂ concentrations could more than double. Inside the phytotrons, the AgriInnova team looks to simulate this potential doomsday, and less extreme scenarios, so we can learn what to expect and how to adapt.

"These two variables affect the way we grow our food, as well as the characteristics of the places where it's grown," researcher Massimo Pugliese explains while showing a phytotron inside the cavernous hangar used for experiments. In short, the future of growing will move closer to the poles, the scientists found. Traditionally frigid Norway and Finland

"could become the new 'corn regions' and maybe compete with California wine areas," Maria says. Italy could become a new North African environment, ideal for growing oranges, lemons, and even tropical fruits — but hostile to vineyards (higher temperatures will boost invasions of parasites). Similar shifts could happen in California, Australia, and other regions with warm, dry climates.

What this means for the already scorching regions along the equator is less promising. Arid regions in Africa and India could see crops shrivel and water supplies depleted; in the ocean, warmer, more acidic water will threaten fish populations.

Food itself could look a bit different from what we eat today. Several vegetables, including salad greens and zucchini, grow faster and larger when CO₂ concentrations are doubled. Arugula leaves become bigger, thicker, and crunchier than their present versions.

"Higher temperatures and CO₂ concentrations could make vegetables grow faster, which could be good news for feeding our planet," Massimo says. "But not all crops react in the same way. Some develop diseases, or just don't adapt to the new conditions." And what about the taste? According to the AgriInnova team, these new vegetables would absorb more water and be less tasty; perhaps the least of the planet's problems.

For now, the focus is on suggesting to the food industry and farmers which plants and foods they could bet on in coming decades. The research, however, is redesigning food labels and refrigerator technology as well. CO₂ levels and temperature could become new information to be printed on the zucchini bag we buy at the supermarket. As Maria explains: "We built these high-tech fridges for experimental purposes but, who knows? Maybe we have just inspired refrigerator producers to introduce new interesting features." ☺