

# HIGH-YIELD, HEAT TOLERANT TOMATOES

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## Technology Description

Researchers in Prof. Lucia Strader's laboratory have cultivated genetically-stable, high-yield tomato plants that are tolerant to high temperature growing conditions (40°C). These plants were identified using a screen for mutants. Excitingly, two mutants (IR-12 and IR-17) produced larger fruit with a shorter growing time under heat stress than wild type plants. These features could decrease costs and increase the value of tomatoes produced with these mutations, while helping to meet the challenges of growing food in areas with increasingly rising temperatures.



**Field testing:** Largest fruit from 8 different plants (*S. lycopersicum*) of M82 (wild type) and IR mutants. Fruit from IR-12 and IR-17 mutants grown in heat stress were almost twice as large as wild type.

## Stage of Research

The inventors conducted field trials in Israel and Florida that demonstrated heat-tolerance (40°C) and high yield in two mutants (IR-12 and IR-17). They have established plants with genetically stable seeds and they continue to study the heat tolerant mutants to identify the causative mutation and further characterize phenotypic effects.

## Applications

- **Tomato breeding and seed production:**
  - using existing IR mutants to breed heat tolerance into tomato cultivars
  - isolating additional mutants with agriculturally attractive features

## Key Advantages

- **High yield** – compared to wild type under high temperature conditions (40°C), IR17 mutant tomato plants:
  - produced more fruit: 9.8 vs. 5.5 fruits/plant
  - bore larger fruit: 527 vs. 285 g/plant
  - had shorter ripening times (flowering to harvest)
  - had normal fruit without sacrificing growing season or hardiness
- **Heat tolerant** – protects plant productivity as tomato growing areas experience higher summer temperatures
- **Genetically stable** – mutations segregate in a Mendelian fashion with a phenotype that persists through multiple backcrosses over more than 5 generation

## Patents

- Pending

## Website

- [Strader Lab](#)