

Growing Tomatoes in Residential Spaces

SQ-512-SS Full-Spectrum Quantum Sensor

SS-110 Field Spectroradiometer



Introduction:

Due to the growing popularity of home gardening, this study investigated the growth and productivity of 20 different tomato breeds in greenhouses and residential spaces. In urban areas without available gardening space, growers typically garden in small containers on balconies or patios or with hydroponic systems. The researchers wanted to determine which breeds of tomatoes would work best in similar types of space-limited growing situations.

Set Up:

The 20 tomato breeds were grown in both a polycarbonate-glazed greenhouse with unit heaters and air-conditioned, indoor grow rooms. The greenhouse study used only sunlight and mimicked normal backyard growing settings with fluctuating conditions. The indoor setting modeled a typical house or apartment by maintaining a constant daily light integral of $11 \text{ mol}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$ of white light, colder temperature ($22 \text{ }^\circ\text{C}$), and moderate humidity. Eight plants of each tomato breed were placed in the two environments in a randomized design. Apogee SQ-512-SS full-spectrum quantum sensors were positioned above the canopy to monitor the light intensity. An Apogee spectroradiometer was also used to generate a lightmap for the experiment.

Results:

The greenhouse tomatoes were larger and yielded more fruit than tomatoes grown indoors. The researchers believe that this was the result of different average DLI, temperature, and humidity. All tomatoes in this study are recommended for outdoor gardening. However, 'Little Bing', 'Sweet Sturdy™ F1—Grace', 'Sweet Sturdy™ F1—Jimmy', 'Sweet Sturdy™ F1—Jo', and 'Tarzan F1' are too large to be grown in small indoor environments. Furthermore, 'Little Bing', 'Rosy Finch', 'Sweet 'n' Neat Yellow', and 'Yellow Canary' were affected by an intumescence disorder when grown indoors, which should be considered when growing indoors without natural UV. The highest yielding species were typically the largest plants.

Conclusion:

All compact tomato plants in this study are suitable for outdoor gardening under sunlight. However, the plants of 'Little Bing', 'Sweet Sturdy™ F1—Grace', 'Sweet Sturdy™ F1—Jimmy', 'Sweet Sturdy™ F1—Jo', and 'Tarzan F1' are typically too large for small-scale, indoor gardening. However, to maximize yield, home growers should grow the largest plant that can fit in their space.

Application Summary

Summary:

Using Apogee full-spectrum quantum meters and a spectroradiometer, this study investigated the growth and productivity of 20 different tomato breeds in greenhouses and residential spaces.

Apogee Sensors Used:

- SQ-512-SS Full-Spectrum Quantum Sensor
- SS-110 Field Spectroradiometer

Location:

Gainesville, Florida, USA

Authors:

- Stephanie Cruz
- Edzard van Santen
- Celina Gómez

Reference Article:

Evaluation of Compact Tomato Cultivars for Container Gardening Indoors and under Sunlight