



Experiment







Evaluation of Spectrix Grow Lights Relative to Gavita High Pressure Sodium Grow Lights

Objectives

The objective was to show that new lighting technology has made it possible to optimize irradiance for greater edible biomass and nutrient density per unit of energy consumed. This experiment sought to determine how the efficiency and spectral distribution of Spectrix lights influences early girl tomato fruit mass. Results were compared to show the differences in crop quality, quantity, and energy efficiency between Spectrix and HPS lights. The experiment was performed in the agricultural research greenhouse at the Center for Applied Horticultural Research in Vista, California.

Treatments

All six lights were positioned 48" above the grow trays. Two Spectrix lights (A1 and B1) and one HPS light (HPS1) were adjusted to 625 watts to compared 3 different spectrums of light at equal power consumption. Two Spectrix lights (A2 and B2) and one HPS light (HPS2) were adjusted to different power levels to compare 3 different spectrums of light at equal light intensity (20% power savings).

| Equal Power | | | 20% Power Savings | | |
|---|---|---|--|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Spectrix A1 625W | Spectrix B1 625W | HPS1 625W | Spectrix A2 550W | Spectrix B2 550W | HPS2 693W |
|  |  |  |  |  |  |



Results

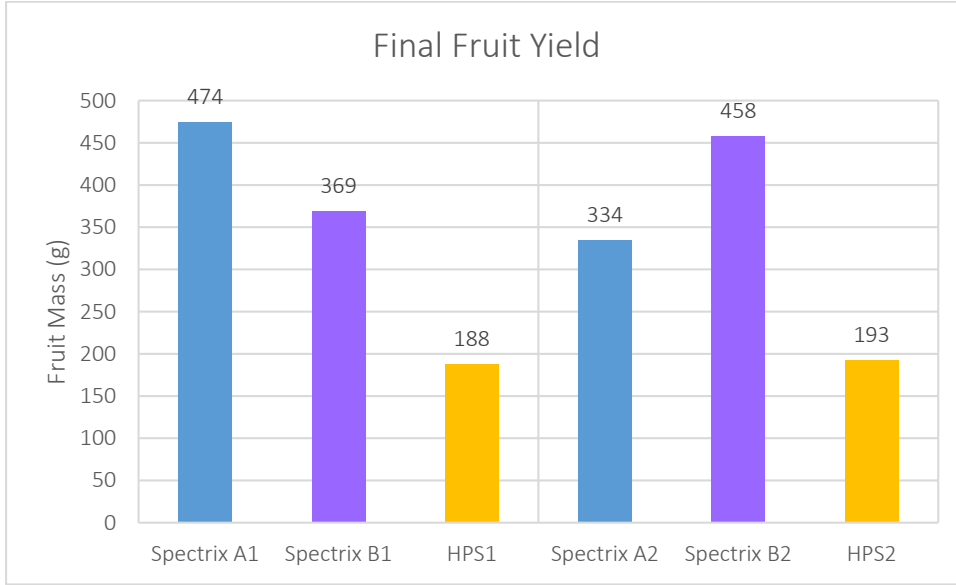


Figure 1. Tomato plants produced greater fruit yield at 90 days with Spectrix lighting compared to HPS (Gavita 625 or 693 watts).

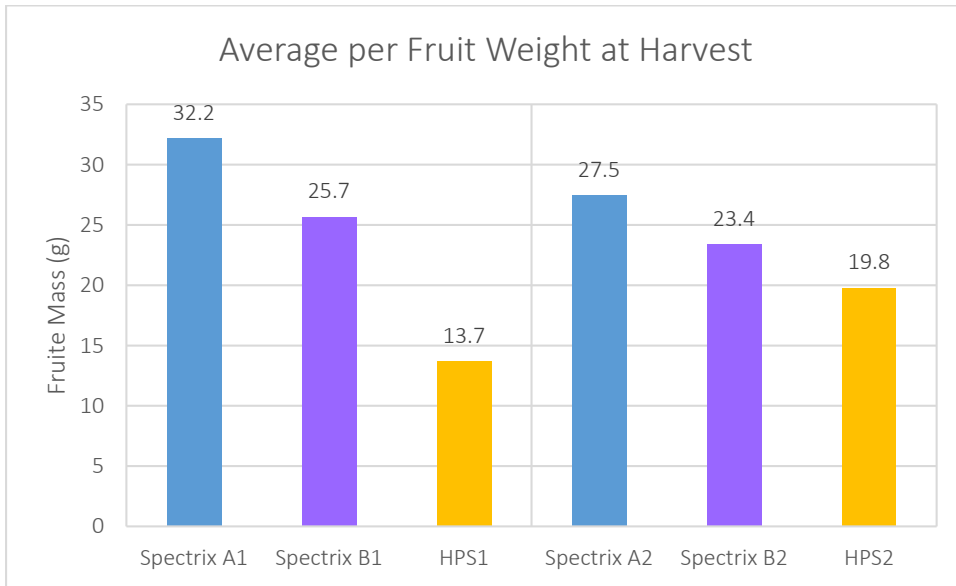


Figure 2. Fruit weight at 120 days was evaluated for Spectrix lights, which produced more fruit per plant than HPS.

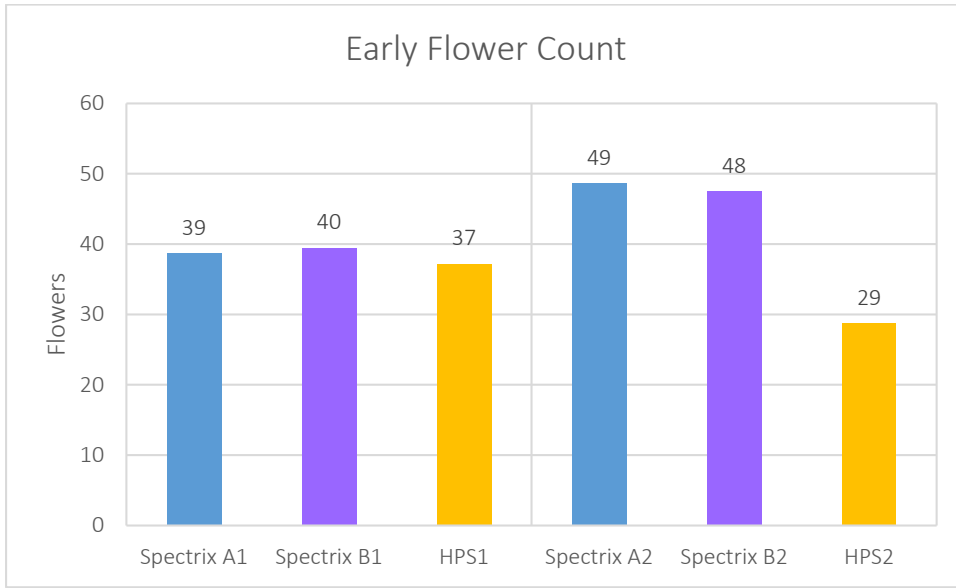


Figure 3. At 40 days, Spectrix lights produced more flowers.

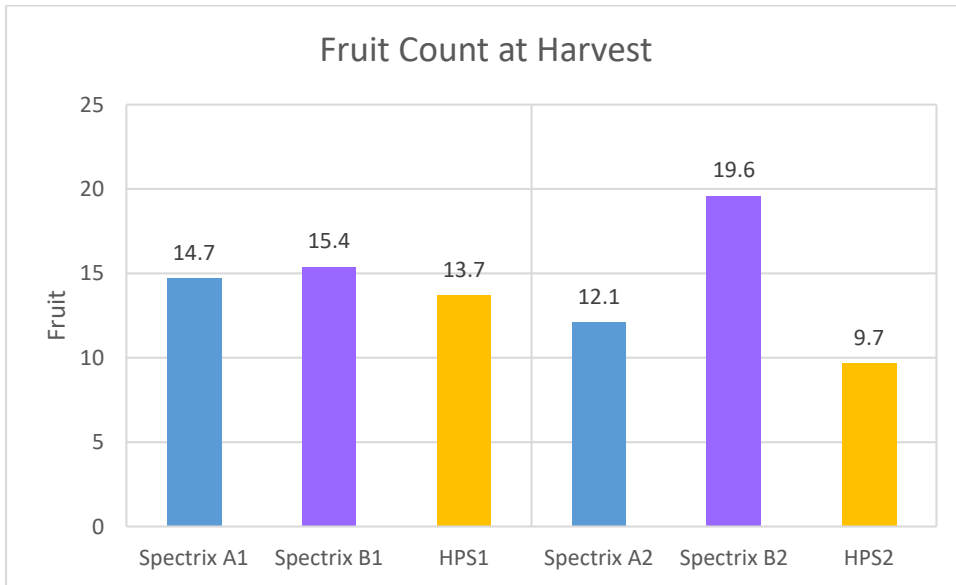


Figure 4. At 120 days, Spectrix lights produced more fruit per plant.

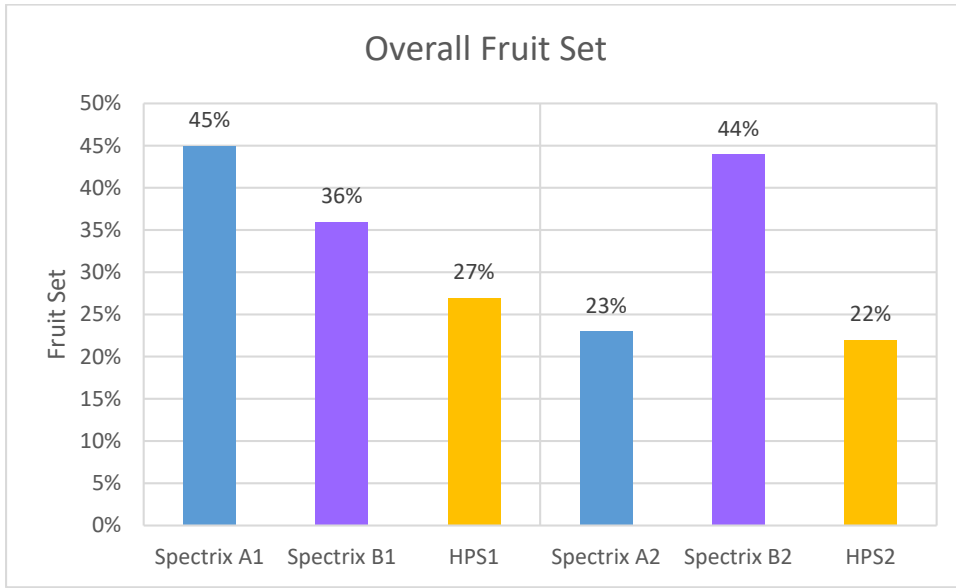


Figure 5. At 120 days, Spectrix and HPS, fruit set per flower

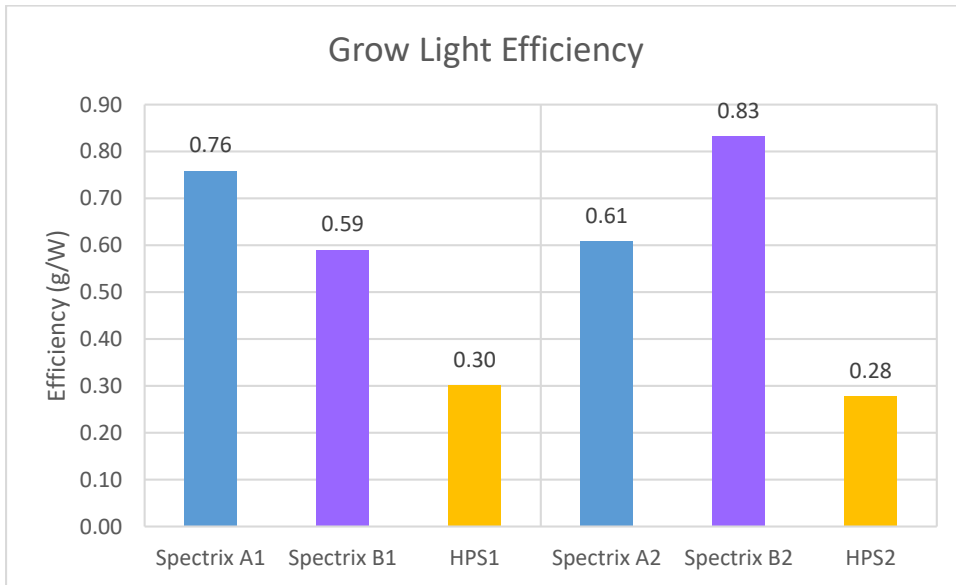


Figure 6. Grow light efficiency is calculated by dividing plant yield (measured in grams) by power consumption (measured in watts).



Conclusion

- Early Girl tomato plants produced greater fruit yield at 90 days, grown under Spectrix lighting (Figure 1) compared to HPS (Gavita 625 or 693 Watts).
- Fruit weight was greatest with Spectrix lights, which produced more fruit per plant at 120 days (Figure 2).
- Flower counts at 30 days were greater with Spectrix A and B at 550W, compared to higher Watt settings of 625W and 693W (Figure 3).
- Fruit set per plant at 120 days was greater with Spectrix than HPS.
- Fruit weight was greatest with Spectrix A at 625W.