

DIFFUSED GLASS TREATED WITH REDUHEAT IMPROVES MICROCLIMATE CONSISTENCY AND PHOTOSYNTHESIS

at Different Heights in the Canopy in a Pepper Greenhouse

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INTRODUCTION AND OBJECTIVES

- A consistent microclimate is ideal for greenhouse fruit and vegetable production.
- Studies have shown the benefits of diffused greenhouse coverings in maintaining a consistent microclimate by scattering and improving the distribution of light in the canopy resulting in more consistent air and leaf temperature in both horizontal and vertical planes.
- The objective of this study was to determine the effect of diffused glass treated with Reduheat on the microclimate and photosynthesis at different heights in the canopy of a high-wire bell pepper crop.

CONCLUSIONS AND DISCUSSION

- Diffused glass treated with Reduheat was associated with more consistent air and leaf temperatures (**Figure 1**) and relative humidity levels (not shown), and an increase in the photosynthesis operating efficiency (Φ_{PSII}) (**Figure 2**) at different heights in the canopy at certain times of the day, but not all times of the day, on sunny and cloudy days.
- The improved consistency of the microclimate at different heights in the canopy and increased photosynthesis efficiency of this bell pepper crop may contribute to better production in terms of greater yield and better fruit quality.

RESULTS

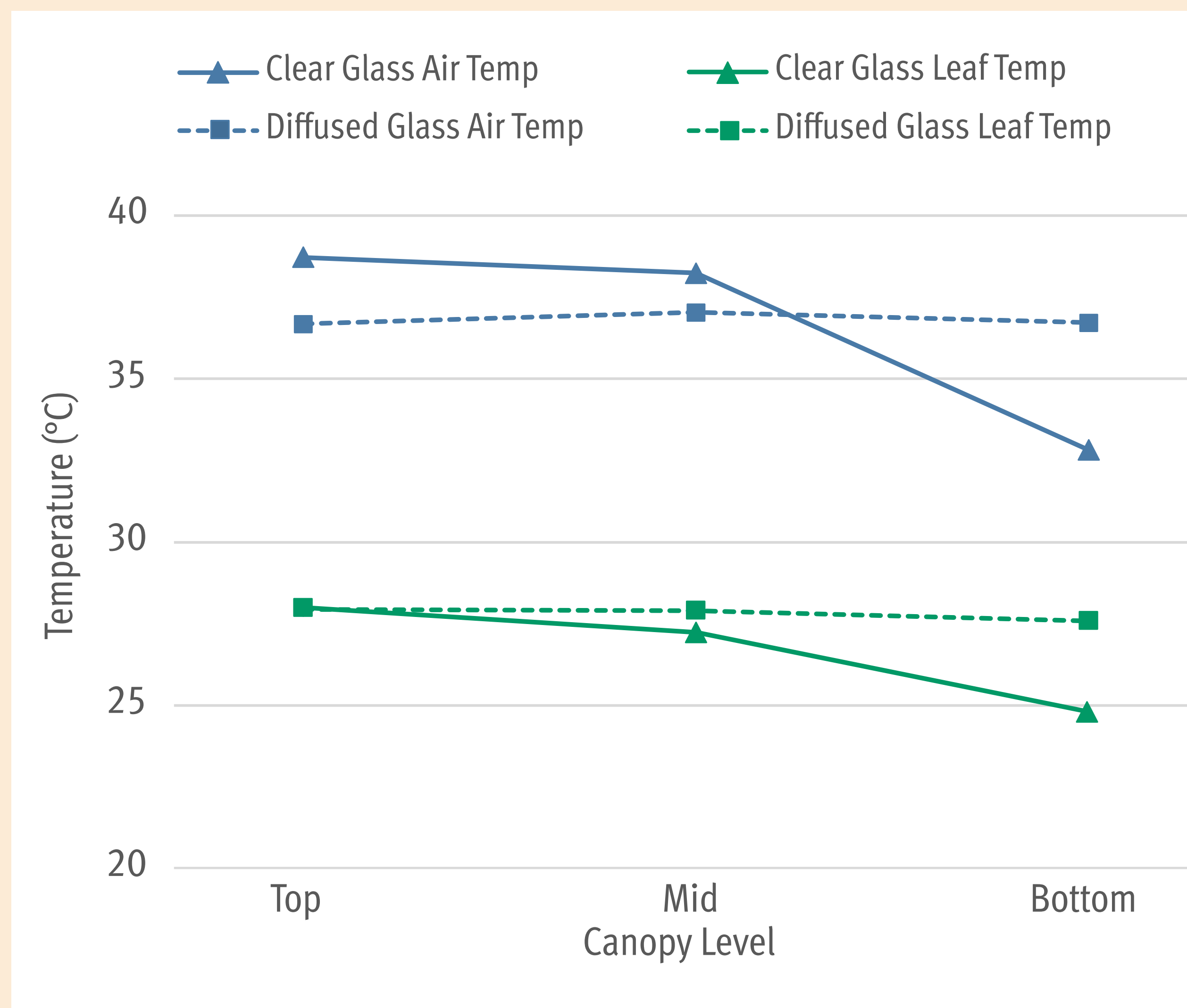


Figure 1: Air and leaf temperature at different heights in the canopy on a sunny summer afternoon under clear glass treated with Redufuse IR and diffused glass treated with Reduheat.

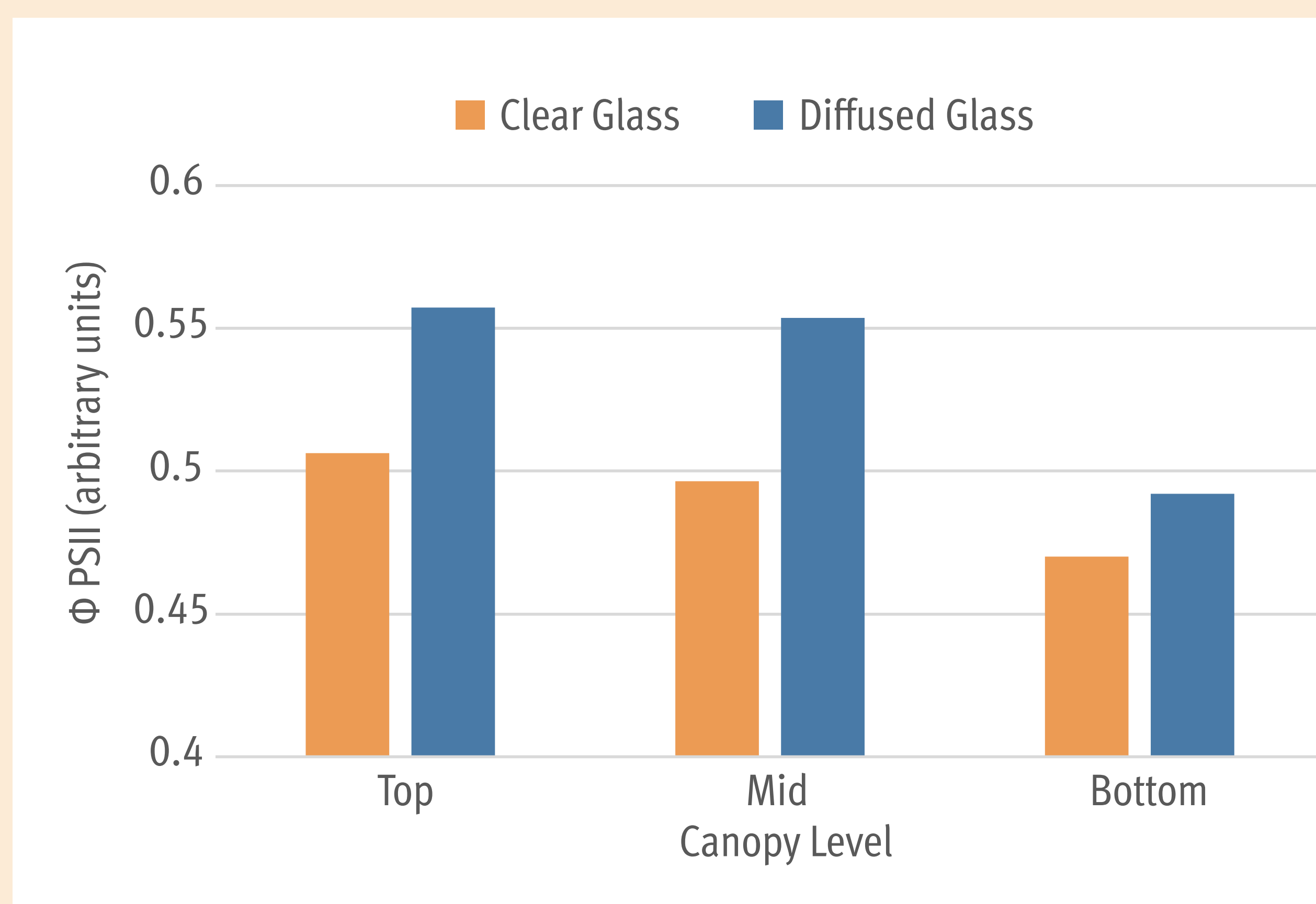


Figure 2: Photosynthesis operating efficiency (Φ_{PSII}) of leaves at different heights in the canopy on a cloudy summer afternoon under clear glass treated with Redufuse IR and diffused glass treated with Reduheat.

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MATERIALS AND METHODS

- A NanoLambda spectrometer (340 nm to 1010 nm) was used to measure light levels, and a PhotosynQ was used to measure microclimate and plant physiology data.
- Data was collected at different heights in the canopy (top, middle and bottom), on sunny and cloudy days (morning, midday, and afternoon), in the summer of 2023, with open curtains, in a high-wire bell pepper greenhouse in southwestern Ontario.
- One greenhouse range had 10-year-old clear glass treated with Redufuse IR (ReduSystems) and the other greenhouse range had 7-year-old diffused glass treated with Reduheat (ReduSystems).

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