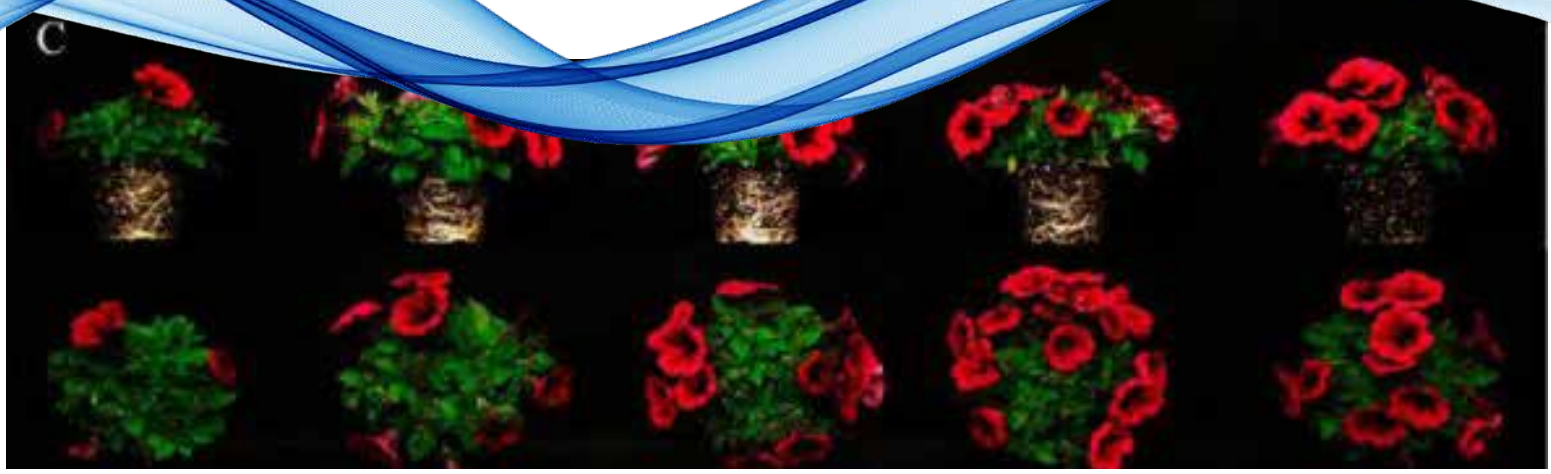
DEVELOPMENT OF PETUNIA

ST-100 Thermistor, ST-110 Thermistor, ST-200 Fine-wire Thermistor



Researchers at Michigan State University used Apogee ST-100, ST-200, and ST-110 thermistors to study the effects of bench-top root-zone heating on the development of rooted cuttings and seedlings of petunia (petunias are one of the most popular bedding plants sold in the United States). The research was published in the journal of HortScience in January 2017.

Petunia plants were grown in two separate greenhouses and exposed to different temperature treatments, and Apogee's thermistors measured the substrate temperature (ST-100 high accuracy thermistor in waterproof housing), plant tissue temperature (ST-200 fine wire thermistor), and canopy air temperature (ST-110 high accuracy thermistor) in each treatment. The researchers found that time to flower was hastened with a higher root zone temperature under a lower air temperature. This implies increased savings for greenhouse operations with shorter production times and potential energy savings by lowering greenhouse air temperature. The researchers also found that plants grown at a lower air temperature with root zone heating were overall a smaller plant size, which is considered beneficial for growers since the plants occupy less bench space for production.

Month	Treatment	Avg DLI (mol·m^{-2}·d^{-1})	Temperature (°C)			
			Air	Canopy	Substrate	Tissue
January	No RZH	13.0	15.9[z]	15.6	16.2	—[y]
	21 °C RZH	11.1		17.1	20.5	—
	24 °C RZH	11.7		17.2	23.1	—
	27 °C RZH	13.4		17.9	25.2	—
	CC	11.0	19.5	18.9	18.6	—
February	No RZH	14.5	14.9	14.4	15.3	14.5
	21 °C RZH	13.4		16.6	21.4	15.2
	24 °C RZH	13.2		17.0	23.3	15.7
	27 °C RZH	14.8		17.1	24.9	16.5
	CC	13.0	19.2	18.7	17.8	16.2
March	No RZH	14.8	15.3	14.9	15.6	15.7
	21 °C RZH	15.3		16.2	21.2	15.9
	24 °C RZH	15.1		17.2	23.2	16.8
	27 °C RZH	14.9		17.4	24.2	19.7
	CC	14.8	19.2	18.7	17.4	16.5

[z]This air temperature is for all RZH treatments.
[y]Fine-wire thermistor inserted on 5 Feb.

Above: Mean DLI and daily air, canopy, substrate, and plant tissue temperature for each treatment, each month following transplant. Plants were grown at a mean daily temperature (MDT) of 15 °C and plants were placed on a bench without root-zone heating (No RZH) or with RZH set points of 21, 24, or 27 °C; or plants were grown in a greenhouse without RZH at an MDT of 20 °C as per commercial control (CC)

Application Summary

Summary
Hastening the development of petunia under a lower air temperature with bench-top root-zone heating.

Apogee Sensors Used
ST-100 Thermistor
ST-110 Thermistor
ST-200 Fine-wire Thermistor

Journal
HortScience

Location
Michigan State University