

Determine the interaction of temperature in the root zone and air temperature and their effect on plant growth and flowering.



The objective of the project was to determine methods to manipulate the bloom period of azaleas in order to speed or delay flowering to coincide with the desired market window (thereby increasing demand and profitability to producers). In order to accomplish this goal, CANR ran a series of trials to look at dormancy manipulation of flower timing. CANR performed a replicated study to determine the interaction of temperature in the root zone and air temperature and their effect on plant growth and flowering. The information from this study has afforded a better understanding of what environmental factors cause plant growth and flowering.

Trial Setup:

Temperature modification chambers were constructed in October 2015 to initiate flowering based on a modified root or air temperature. Three wooden boxes were constructed, ten feet (120”) long and two feet (24”) wide with half inch thick foam insulation board on the inside. Five three gallon plants of Encore ‘Autumn Sangria’, ‘Formosa Purple’ and ‘Sunglow’ azaleas were placed in each box for a total of 15 plants per box. The plants were randomized.

One box had temp controlled heating mats under the plants. (Root zone heat)

One box had six 125 watt heat lamps placed 4-6” above the foliage. (Heated air temp)

One box had no additional heat added (Control).

The root and air temperature enclosures used foam insulation board at the crown of the plants leaving only the foliage uncovered. A Poly tent was placed over the box modifying the air temperature to ensure heat would not move to the other trial areas. In order to maintain consistent light levels over the entire project, the other two boxes were also covered by a layer of poly. Temperature loggers were utilized to track temperature in all zones. Temperature was kept at 77°F in the modified areas. Temperature modification started on January 22, 2016 and finished April 22, 2016. The project was repeated in 2017.



Results and discussion:

We found a significant difference in plant growth and flowering in various treatments. Plants in the high air temperature treatment (with ambient root zone temperature) bloomed a month earlier than those in the high soil temperature treatment (with ambient air temperature). This project was repeated over two growing seasons to confirm results. For a sample of timing data please see the data sheet on the [CANR Web page](#). Understanding the significant potential air temperature plays in blooming will help to target future studies in further exploring applicable methods of air temperature modification, potentially further looking what are the key vegetative parts of a plant cause the temperature response, leaves, stems, buds, or a combination. This work should also be helpful in the design of forcing structures to know that air temperature is the key and addition of bottom heat will not speed flowering on azaleas.

This project is currently being detailed for journal submission, once complete we will post the complete results here.