Introduction

Gibberellic acid is a naturally occurring plant hormone that regulates growth such as stem elongation and germination. Paclobutrazol is a synthetic growth regulator that inhibits the formation of gibberellic acid resulting in altered growth. Trimtect, a formulation incorporating paclobutrazol, is used commercially and sprayed on the foliage of landscape plants to sustain desired growth forms and reduce maintenance. Studies have shown that paclobutrazol applications lead to reduced internode length, leaf area, and overall plant height in several woody species.1,2 Chlorophyll, a leaf pigment, has also been seen to increase in response to paclobutrazol application in many species.3

Rainbow Treecare Scientific Advancements (Minneapolis, MN), the manufacturers of Trimtect, partnered with our Plant Form and Function class to research Trimtect’s effects on the morphology of three common landscaping shrub species (Hydrangea macrophylla, Buxus sinica, and Rhus aromatica). It was our objective to determine the morphology altering properties of Trimtect to provide empirical evidence for Rainbow Treecare Scientific Advancements to develop new formulations and improve guidelines for commercial use.

Methods

- Trimtect treatments (Trimtect treated, not treated) applied to 3 species: Hydrangea macrophylla, Buxus sinica, and Rhus aromatica (n=20/treatment combination)
- Stem internode length was measured from below the uppermost fully expanded leaf (3 branches per individual)
- Chlorophyll content was measured on uppermost fully expanded leaves (3 per individual, Minolta SPAD-502 chlorophyll meter)
- Average height and circumference of each plant were also measured.
- These morphological measures were taken at multiple times over six months following the Trimtect treatment

References


Conclusion

Morphological changes were not seen until three months following Trimtect application and the magnitude of these changes varied among species, with one species (Buxus) insensitive to Trimtect. Others did show overall more compact growth compared to those not treated, as predicted based on prior findings. However, the expected increase in chlorophyll as a response to paclobutrazol (active ingredient in Trimtect) was not observed in this study.

These morphological effects of Trimtect may help reduce the maintenance requirements, such as pruning, of landscape shrubs. However, it is important to note that the size altering responses take time. Our results are guiding new formulations of Trimtect and improved strategies for commercial use of plant growth regulators. Rainbow Treecare Scientific Advancements has modified their Trimtect formulation based on these results and it is currently being evaluated by the spring 2019 Plant Form and Function class.

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