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Abscisic Acid and Kaolin for Heat Stress Mitigation during Strawberry Plug Transplant Establishment

Poster 25140

Prosanta K. Dash[1], Carlene A. Chase[1], Shinsuke Agehara[2], Lincoln Zotarelli[1], Zhengfei Guan[2]

[1]Horticultural Sciences Department and [2]Gulf Coast Research and Education Center, University of Florida

Introduction

Although Florida is the leading producer of winter strawberries (*Fragaria* ×*ananassa* Duch.) in the United States (USDA, 2015), in recent years the Florida strawberry industry has faced increasing competition for the winter market from Mexico and California. Shifting strawberry production in Florida to earlier in the season has been suggested as a means of increasing profits in a challenging market (Wu et al., 2015). However, earlier planting would expose transplants to higher soil and air temperatures and heat-tolerant cultivars are not currently available. The **goal** of the present research was to assess the effects of s-abscisic acid (s-ABA) and kaolin on the mitigation of heat stress during early-season establishment of 'Florida Radiance' strawberry plug transplants. The specific **objective** was to determine the optimum rate of s-ABA and number of kaolin sprays that should be evaluated in future experiments.

Conclusions

- Strawberry plant survival, vigor, and yields were adversely affected by s-ABA rates of 500 mg/L or greater.
- The highest strawberry yields were obtained with the double application of kaolin and 250 mg/L s-ABA.
- Therefore, 250 mg/L s-ABA and the double application of kaolin appear to have the best potential for mitigating heat stress during strawberry transplant establishment.

Materials and Methods

- **Location:** The Plant Science Research and Education Unit, Citra
- **Planting Date**: October 12, 2015
- **Planting Materials:** 'Florida Radiance'
- **Transplant Type:** Jiffy plug
- **Design**: Randomized complete block design (RCBD), 4 replications
- **Plant Arrangement**: Two rows per plot, 40 transplants per plot
- **Treatments:** s-ABA (ProTone®) and kaolin (Surround®)

• Control • PT1: 250 mg/L s-ABA • PT2: 500 mg/L s-ABA • PT3: 750 mg/L s-ABA • PT4: 1000 mg/L s-ABA	• S1X: 60 g/L kaolin – 1 spray at planting • S2X: 60 g/L kaolin – 2 sequential sprays: the first at planting and the second at 7 days after planting.

- **Statistical Analysis:** Appropriate ANOVA for RCBD with SAS JMP 12.2.0 software.

Fig. 1. Five-second root dip in s-ABA solution before transplanting

Fig. 2. Application of kaolin shortly after transplanting

Results

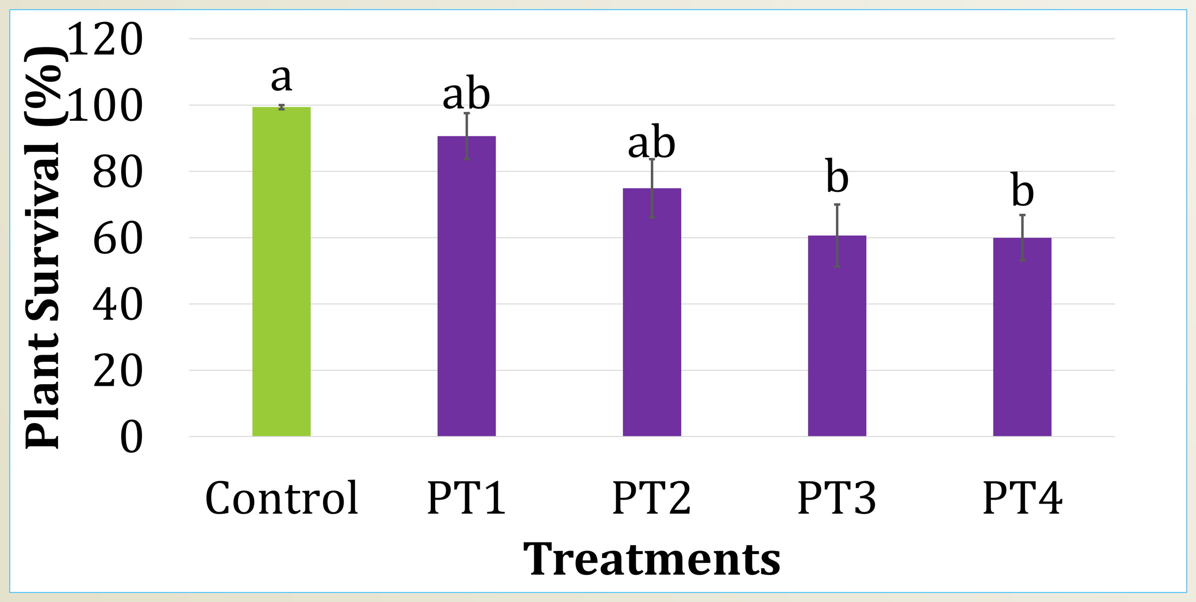

Fig. 3. Effect of s-ABA on survival of strawberry plants

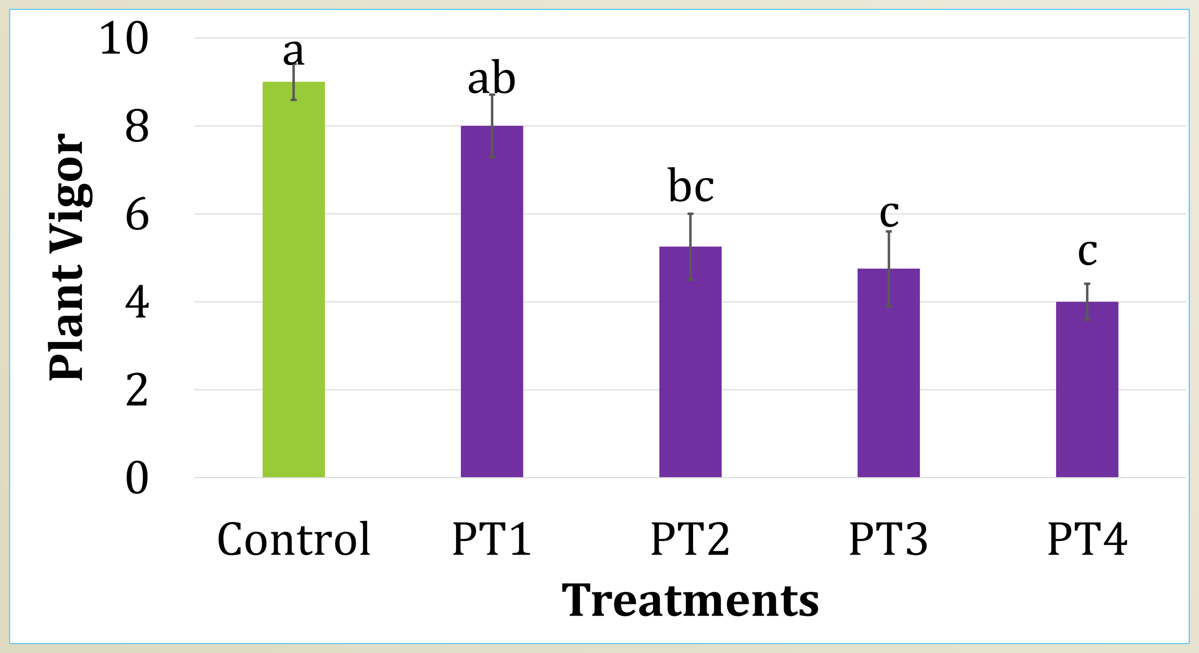

Fig 4. Effect of s-ABA on strawberry plant vigor

Table 1. Effect of s-ABA on reproductive and yield parameters

Treatment	Days to First Flower	Days to First Harvest	Early Marketable Yield (kg/ha)	Total yield (kg/ha)
Control	17 c	39 cd	6342 b	12408 b
PT1	16 c	38 d	7634 a	14212 a
PT2	16 c	42 c	4177 c	8864 c
PT3	22 b	48 b	3381 d	7913 d
PT4	29 a	55 a	2788 d	7373 d
P-value	0.0001	0.0001	0.0001	0.0001

Table 2. Effect of kaolin on reproductive and yield parameters

Treatment	Days to First Flower	Days to First Harvest	Early Marketable Yield (kg/ha)	Total Yield (kg/ha)
Control	17	39	6342 c	12408 c
S1X	16	38	7768 b	16246 b
S2X	15	37	8605 a	17850 a
P-value	0.44	0.44	0.0001	0.0001

References

USDA. 2015. Quick Stats 2.0. U. S. Department of Agriculture (USDA), National Agricultural Statistics Service, Washington, D.C.

Wu F., Z. Guan, V. Whitaker. 2015. Optimizing yield distribution under biological and economic constraints: Florida strawberries as a model for perishable commodities. Agricultural Systems 141:113–120.

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