

Use of ABA for Processing Tomato Transplant Height Control – 2007

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Objective: To investigate the use of ABA (abscisic acid) as a drench application of 200 and 400 ppm solutions (1,000 ml per plug tray) to control height in processing tomato transplants. Treatments will be evaluated for their effect on transplant height control, field establishment, crop growth and final marketable yield. In a greenhouse study conducted in 2005, preliminary studies found that ABA applied at 200 and 400 ppm controlled tomato ('Peto 696') transplant height by as much as 67% compared to untreated controls.

Materials and Methods: 'OX 325' and 'Gem 611' were seeded into 288-cell plug trays on April 26. Plants were grown under standard practices in the greenhouse. On May 23, the 4 week old seedlings were drench treated with 200 or 400 ppm ABA solutions (1,000 ml per plug tray). Untreated controls were also compared to ABA treatments. Plants were measured prior to ABA application and again 5 days later at field transplanting. Plants were established at the North Central Ag Research Station (Fremont, OH) in 3 replications on raised beds 5 feet apart with in-row plant spacing of 12 inches. Percent survival, plant height, stem diameter and dry weight of 5 plants was collected 3 weeks after transplanting. Plots were hand on August 30.

Results: Five days after the initial ABA application, there were no statistical (0.05 level) differences in plant height control with 'Gem 611' although transplants tended to be shorter (8-12% compared to the control). Height control in 'OX 325' was reduced by 2% (NS) and 21% with 200 and 400 ppm, respectively. No differences in percent survival, plant height or plant dry weight were found for either variety 3 weeks after transplant (WAT). There were differences in stem diameter in 'Gem 611' with 400 ppm ABA producing thicker stems. 'OX 325' stem diameter differences were not significant (Table 1). Marketable (red, green fruit) T/A, cull T/A, average fruit size and percent red fruit at harvest were not significantly influenced by ABA treatment for either variety. Marketable yields of 'Gem 611' ranged from 13.1 to 16.4 T/A. Marketable yields for 'OX 325' ranged from 20.8 to 23.0 T/A. Results this year show that ABA reduced plant heights 5 days after application for 'OX 325' tomato transplants but there were no differences (other than the 'Gem 611' stem diameter effect) after 3 weeks in the field (Table 1). ABA can be an effective height control strategy particularly when planting is delayed in the spring due to inclement weather at the time of field establishment. Cultivar responses to ABA in our 2007 research suggest that more study is needed to fine-tune this transplant height control strategy.

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Table 1. Use of ABA for Processing Tomato Transplant Height Control - 2007

Prior to ABA Application:

Treatment	Plant ht. (cm)	Stem diam (mm)
'Gem 611'	13.5	2.8
'OX 325'	12.0	2.7

Cultivar	Treatment	5 days after ABA application	-----3 wks after transplanting-----			
		(at transplant) Plant ht. (cm)	Percent survival	Plant ht. (cm)	Stem diam. (mm)	Dry wt of 5 plants (gm)
'Gem 611'	Control	15.0	100	22.1	7.8	31.9
'Gem 611'	ABA 200 ppm	13.8	100	21.8	8.8	34.3
'Gem 611'	ABA 400 ppm	13.2	100	20.1	9.3	35.3
LSD (0.05)		NS	NS	NS	1.11	NS
p value		0.078	-	0.552	0.045	0.458
CV		7.5	0	6.8	9.1	14.5
'OX 325'	Control	14.5	100	19.9	8.0	35.99
'OX 325'	ABA 200 ppm	14.2	100	20.4	8.0	35.75
'OX 325'	ABA 400 ppm	11.5	100	17.7	7.9	33.03
LSD		1.38	NS	NS	NS	NS
p value		0.003	-	0.05	0.989	0.829
CV		11.7	0	8.5	8.5	20.9

Cultivar	Treatment	Red T/A	Green T/A	Culls T/A	Avg. fruit wt (lb)	Percent red fruit
'Gem 611'	Control	13.1	3.1	1.9	0.15	72
'Gem 611'	ABA 200 ppm	16.4	2.8	2.8	0.14	75
'Gem 611'	ABA 400 ppm	14.5	2.8	1.9	0.14	75
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LSD (0.05)		NS	NS	NS	NS	NS
p value		0.247	0.934	0.304	0.704	0.715
CV		17.6	34.5	36.8	4.10	5.7
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'OX 325'	Control	23.0	7.4	1.2	0.14	73
'OX 325'	ABA 200 ppm	22.0	8.9	1.4	0.14	68
'OX 325'	ABA 400 ppm	20.8	9.9	2.4	0.14	63
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LSD		NS	NS	NS	NS	NS
p value		0.803	0.674	0.745	0.729	0.309
CV		14.2	35.3	10.1	5.7	11.0

FN: processing tomato ht control yield and all tables2007.xls