

Use of ABA for Processing Tomato Transplant Height Control – 2006

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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 52' and 'Gem 611' were seeded into 288-cell plug trays on May 5. Plants were grown under standard practices in the greenhouse. On June 1, 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 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 harvested on September 19.

Results: Five days after the initial ABA application, height control in 'Gem 611' was reduced by 11% and 31% with 200 and 400 ppm, respectively. Height control in 'OX 52' was reduced by 37% and 38% with 200 and 400 ppm, respectively. No differences in plant height were recorded 3 weeks after transplant (WAT), and there were no differences in percent plant survival. There were differences in stem diameter and plant dry weight. 'Gem 611' seedling dry weight responded strongly to ABA rates, but stem diameters were not affected. Conversely, 'OX 52' seedling weights were unaffected by ABA treatment, while stem diameters 3 WAT were increased by 400 ppm ABA drenches (Table 1). Marketable T/A for 'Gem 611' was unaffected by ABA treatments (4.1 T/A on the untreated control and 4.4 T/A for the 200 and 400 ppm treatments). Marketable yield for 'OX 52' ranged from 6.1 T/A for ABA 400 ppm, 7.4 T/A for ABA 200 ppm and 9.4 T/A for the untreated control (Table 1). Low yields throughout the plots are due to placement in a low lying field and heavy, untimely rains throughout the growing season in Northwest Ohio. Results this year show that ABA reduced plant heights 5 days after application but there were no differences 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. Unique cultivar responses to ABA in our 2006 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 - 2006

Prior to ABA Application:

Treatment	Plant ht. (cm)	Stem diam (mm)
'Gem 611'	6.4	2.4
'OX 52'	10.2	2.9

Cultivar	Treatment	5 days after ABA application (at transplant)	-----3 wks after transplanting-----			Dry wt of 5 plants (gm)
		Plant ht. (cm)	Percent survival	Plant ht. (cm)	Stem diam. (mm)	
'Gem 611'	Control	9.8	96	17.5	6.7	9.89
'Gem 611'	ABA 200 ppm	8.8	97	16.2	6.7	7.46
'Gem 611'	ABA 400 ppm	6.8	94	15.0	6.4	5.94
'OX 52'	Control	16.8	97	16.7	5.4	7.17
'OX 52'	ABA 200 ppm	10.7	99	15.6	6.0	6.16
'OX 52'	ABA 400 ppm	10.5	98	14.6	6.6	6.77
LSD		1.23	NS	NS	0.76	2.42
CV		30.5	4.0	10.8	11.3	26.8

Cultivar	Treatment	Red T/A	Green T/A	Culls T/A	Avg. fruit wt (lb)	Percent red fruit
'Gem 611'	Control	4.1	5.0	2.8	0.09	35
'Gem 611'	ABA 200 ppm	4.4	6.8	1.7	0.09	33
'Gem 611'	ABA 400 ppm	4.4	5.3	1.3	0.09	40
'OX 52'	Control	9.4	6.8	2.3	0.08	51
'OX 52'	ABA 200 ppm	7.4	5.2	1.7	0.08	51
'OX 52'	ABA 400 ppm	6.1	5.6	1.8	0.07	46
LSD		3.5	NS	NS	NS	13.0
CV		50.5	45.6	50.3	29.5	24.3