

1997

PACLOBUTRAZOL seed treatment in TOMATO for improved tolerance to EARLY TRANSPLANTING and EARLY HARVEST MATURITY

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Research priorities reviewed by the Tomato Research and Services Subcommittee 1996 recommended that tomato plug transplant management needs refining and that Industry supported the development of cultural practices to enhance earliness in processing tomatoes. During the 1997 season seeds of H9230, H9478, H9909, Peto 2196 and Peto 696 were primed with Paclobutrazol at Guelph, and seedlings raised in greenhouses under a nutrient loaded regime at RCAT and two locations in Leamington with Heinz Growers Enns and Walker Farms. The seedlings were subsequently transplanted in 6 replicated field trials at these locations in Ridgetown and Leamington. Transplanting dates were staggered from early (12/05/97) to late (06/06/97), where 22/05/97 was the Heinz suggested date for Growers in the Leamington area. Greenhouse experiments on seedling drought tolerance were carried out at Guelph.

RESULTS

Frost/low temperature/drought tolerance: Seedling frost damage at the two Enns sites was rated on the 26/05/97 following transplanting (12/05/97 and 20/05/97) and frost/low temperature field conditions at the post-transplant stage. Results outlined in Table I indicate a trend and significance of improved seedling tolerance with the Paclobutrazol seedlings. Drought stress trials at the Guelph Greenhouses of these processing cultivars, involved no watering of the seedling flats till all the seedlings wilted, when they were rewatered and subsequently rated for wilt damage. Results presented in Table II confirmed the improved tolerance of Paclobutrazol seedlings to drought stress, as expressed in seedling turgidity recovery.

Transplant seedling vigour: Following transplanting in the field in May '97, the trials were rated for vigour in late June '97, which was 18 to 42 (DAT) days after transplanting. Data summarized in Table III indicated significant differences in favour of Paclobutrazol seedlings. Stand quality differences between the two treatments were higher with the early transplanted trials as compared to the late transplanted trials and ranged from 27% to 31%. With the late transplanted trials, higher field temperatures may have favoured tomato seedling growth which might explain the lack of difference between the two treatments.

Early harvest maturity: Earliness in harvest maturity as recorded in Table IV resulted in significant counts (#) of reds/breakers just prior to harvest. At harvest, the data of fruit weight in Table V when evaluated as the proportion of reds/breakers to total yield, confirmed the earliness response attributed to the Paclobutrazol plants. Field appraisal of harvest earliness was rated at 7 to 10 days earlier with the Paclobutrazol plots as compared to the control plots. No significant differences in total yield between the two treatments was recorded in all the six trials, which confirmed similar responses in 1995 and 1996.

Table I. FROST/LOW TEMPERATURE DAMAGE IN TRANSPLANTED SEEDLINGS (Processing Tomato) '97.

Transplanted Date rated		Enns (E)	Enns (L)	Mean
		12/05/97 26/05/97	20/05/97 26/05/97	
cv. H9230	Paclo	16.3 ^x bc	14.0 cd ^y	15.15
	Control	30.3 a	26.5 ab	28.40
cv. H9478	Paclo	15.3 bc	18.5 bc	16.90
	Control	26.0 ab	25.8 ab	25.90
cv. H9909	Paclo	10.5 c	9.8 d	10.15
	Control	23.3 ab	25.0 ab	24.15
cv. Peto 696	Paclo	-	20.0 bc	
	Control		24.0 ab	
cv. Peto 2196	Paclo	-	19.8 bc	
	Control		29.0 a	

^x Rating was # of bleached seedlings/plot

^y Duncan's Multiple Range Test (P = 0.05)

Table II. SEEDLINGS RESPONSE to DROUGHT STRESS '97.

	Visual ratings ^x	
	Paclobutrazol	Control
cv. H9230	3.48 ^y ± 0.09	4.55 ± 0.04
cv. H9478	3.25 ± 0.14	4.47 ± 0.04
cv. H9909	3.51 ± 0.07	4.52 ± 0.03
cv. Peto 696	2.82 ± 0.18	3.30 ± 0.15
cv. Peto 2196	2.99 ± 0.18	3.05 ± 0.14

^x Rating: 1 ... no wilt damage or leaf necrosis.
 2 ... leaves green and non-necrotic.
 4 ... leaves and stem with some necrosis.
 5 ... dead total necrosis.

^y Mean of 5 treatments with 4 replications.