

## Effect of Promot on Lisianthus Plants

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A Trichoderma spp. containing product, Promot, was reported to have positive effect on plant growth especially under greenhouse conditions. This study was to investigate the effects of Promot on flower plants growing under greenhouse conditions.

### Material and Methods

Greenhouse experiment was conducted in Ventura, California in 1995. Promot liquid containing Trichoderma harazianum at  $2.0 \times 10^8$  conidia/g and Trichoderma koningii at  $3.0 \times 10^8$  conidia/g was used for the test. Randomized complete block design was employed with 3 treatments and 4 replications. Twelve 20 cm pots were filled with potting soil at 2.5 kilograms per pot. Lisianthus plants with average plant height of about 17 cm were obtained from local nursery. The treatments include the following:

Control	--	No application of Promot
P100	--	Promot diluted with 100 times of water
P200	--	Promot diluted with 200 times of water

Plugs containing the Lisianthus plants were drenched with solutions containing Promot, 7 days before transplanting. Each plant received 10 ml of the solution. Plants in the control group received equal amounts of distilled water. Seven days after the treatment, August 24, 1995, plants were transplanted to the pots.

Number of flowers on each plant was recorded on September 19, September 24, October 13 and November 6. Plant height was measured on November 6, 1995. After the measurement of plant height, plants were cut at the soil surface, weighed for fresh weight, dried in an oven at 75°C for 48 hours and the weight was recorded as dry matter yield.

### Results and Discussion

The number of flowers from each plants measured on September 19 and September 28 is shown in Table 1. The number of flowers from each plant measured on October 13 and November 6 is shown in Table 2. The average number of flowers from each treatment measured at different stages is shown in Table 3. There was no significant difference on the number of flowers among the treatments measured on September 19. Treatment with Promot diluted with 200 times of water significantly increased the number of flowers measured on September 28. However, at the same measurement treatment with Promot diluted with 100 times of water did not affect the number of flowers. Even though treatment with Promot diluted with 200 times of water increased the number of flowers measured on October 13, the increase was not statistically significant.

Measurement made on November 6 showed that treatment with Promot diluted with 200 times of water increased the number of flowers significantly.

As shown in Tables 4, 5 and 6, Promot treatments did not affect plant heights, fresh weight and dry weight.

**Table 1. Number of flowers of Lisianthus plants measured on September 19 and 28**

Treatment	No. of flowers/plants							
	9/19				9/28			
	1	2	3	4	1	2	3	4
Control	1.0	2.0	1.0	3.0	3.0	3.0	2.0	4.0
P100	1.0	2.0	1.0	3.0	2.0	3.0	2.0	3.0
P200	3.0	1.0	1.0	4.0	6.0	3.0	4.0	6.0

**Table 2. Number of flowers of Lisianthus plants measured on October 13 and November 6**

Treatment	No. of flowers/plants							
	10/13				11/6			
	1	2	3	4	1	2	3	4
Control	5.0	7.0	4.0	5.0	8.0	7.0	6.0	4.0
P100	5.0	8.0	4.0	5.0	8.0	8.0	10.0	5.0
P200	9.0	6.0	9.0	9.0	12.0	8.0	12.0	9.0

**Table 3. Average number of flowers of Lisianthus plants measured at different stages**

Treatment	Average number of flowers/plants*			
	9/19	9/28	10/13	11/6
Control	1.8 a	3.0 b	5.3 a	6.5 b
P100	1.8 a	2.5 b	5.5 a	7.8 b
P200	2.3 a	4.8 a	8.3 a	10.3 a

\*Means in the same column not followed by a common letter differ significantly ( $P \leq 0.05$ ) as determined by DMRT.

**Table 4. Plant heights of Lisianthus plants with different treatments**

Treatment	Plant Height (cm)				Average*
	1	2	3	4	
Control	53	44	52	28	44 a
P100	38	39	46	27	38 a
P200	45	58	49	40	48 a

\*Means in a column not followed by a common letter differ significantly ( $P \leq 0.05$ ) as determined by DMRT.

**Table 5. Effect of Promot on fresh weights of Lisianthus plants.**

Treatment	Fresh Weight (g/plant)				Average*
	1	2	3	4	
Control	40.2	32.8	35.1	29.4	34.4 a
P100	29.2	31.7	29.6	20.2	27.7 a
P200	31.6	42.3	34.6	25.3	33.5 a

\*Means in a column not followed by a common letter differ significantly ( $P \leq 0.05$ ) as determined by DMRT.

**Table 6. Effect of Promot on dry weights of Lisianthus plants**

Treatment	Dry Weight (g/plant)				Average*
	1	2	3	4	
Control	8.04	6.25	6.84	4.75	6.47 a
P100	6.34	6.15	6.34	3.54	5.59 a
P200	7.19	7.93	7.45	4.29	6.72 a

\*Means in a column not followed by a common letter differ significantly ( $P \leq 0.05$ ) as determined by DMRT.

**Table 7. Analysis of variance on the number of flowers measured on September 19**

Source of variation	df	SS	MS	F
Treatment	2	0.67	0.33	0.60 ns
Block	3	8.92	2.97	5.35*
Error	6	3.33	0.56	
Total	11	12.92		

**Table 8. Analysis of variance on the number of flowers measured on September 28**

Source of variation	df	SS	MS	F
Treatment	2	11.17	5.58	6.93*
Block	3	4.92	1.64	2.03 ns
Error	6	4.83	0.81	
Total	11	20.92		

**Table 9. Analysis of variance on the number of flowers measured on October 13**

Source of variation	df	SS	MS	F
Treatment	2	22.17	11.08	3.73 ns
Block	3	2.67	0.89	0.30 ns
Error	6	17.83	2.97	
Total	11	42.67		

**Table 10. Analysis of variance on the number of flowers measured on November 6**

Source of variation	df	SS	MS	F
Treatment	2	29.17	14.58	7.61*
Block	3	19.00	6.33	3.30 ns
Error	6	11.50	1.92	
Total	11	59.67		

**Table 11. Analysis of variance on the heights of Lisianthus plants**

Source of variation	df	SS	MS	F
Treatment	2	226.50	113.25	3.35 ns
Block	3	556.92	185.64	5.49*
Error	6	202.83	33.81	
Total	11	986.25		

**Table 12. Analysis of variance on the fresh weights of Lisianthus plants**

Source of variation	df	SS	MS	F
Treatment	2	105.46	52.73	3.50 ns
Block	3	198.91	66.30	4.40 ns
Error	6	90.37	15.06	
Total	11	394.75		

**Table 13. Analysis of variance on the dry weights of Lisianthus plants**

Source of variation	df	SS	MS	F
Treatment	2	2.79	1.39	4.13 ns
Block	3	17.35	5.78	17.16**
Error	6	2.02	0.34	
Total	11			