

# 식물생장조절제 Cerone과 Terpal-C가 유채의 耐凍性 및 耐寒性에 미치는 효과

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Effects of Two Plant Growth Regulators, Cerone and Terpal-C, on Freezing Tolerance and Winter Survival of Canola (*Brassica napus* L.)

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## Objectives :

To determine the effect of two plant growth regulators, Cerone and Terpal-C, on freezing tolerance and winter survival of canola as a short term solution of increasing the freezing tolerance of crop plants.

## Materials and Methods :

Three representative canola cultivars were applied with two type of plant growth regulators, Terpal-C (a mixture of mepiquad chloride and ethephon) and Cerone (ethephon). Leaf freezing tolerance was evaluated by electroleakage tests before and after chemical application. Winter survival was estimated under field condition.

## Results and Discussions :

1) Cerone had little or no effect in increasing freezing tolerance of canola. However, Terpal-C decreased the freezing tolerance of all cultivars examined suggesting this treatment seemed to inhibit the normal development of freezing tolerance (Fig.1, 2, 3, and Table 1).

2) Both Terpal-C and Cerone treatment had no significant effect on the winter survival of the canola. The only effect of winter survival was among cultivars during the second years of two year experiments. No interaction occurred between growth regulators and cultivars (Table 2).

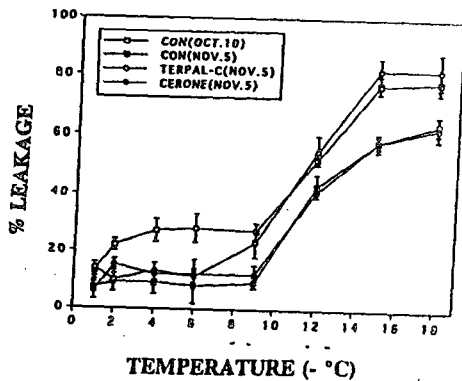


Figure 1. Effect of plant growth regulators, Terpal-C and Cerone, on freezing tolerance of winter canola cv. WRG86. Freezing tests were conducted before chemical treatment (Oct. 10) and 25 days after chemical treatment (Nov. 5). Vertical bar indicates mean  $\pm$  SE.

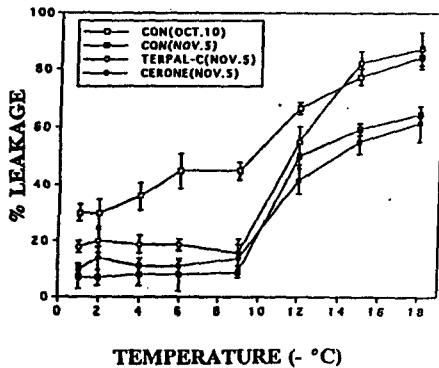


Figure 2. Effect of plant growth regulators, Terpal-C and Cerone, on freezing tolerance of winter canola cv. Duobul. Freezing tests were conducted before chemical treatment (Oct. 10) and 25 days after chemical treatment (Nov. 5). Vertical bar indicates mean  $\pm$  SE.

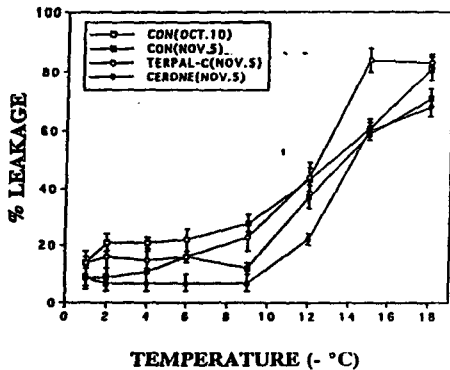


Figure 3. Effect of plant growth regulators, Terpal-C and Cerone, on freezing tolerance of winter canola cv. RWC4113. Freezing tests were conducted before chemical treatment (Oct. 10) and 25 days after chemical treatment (Nov. 5). Vertical bar indicates mean  $\pm$  SE.

Table 1. Effect of plant growth regulators, Terpal-C and Cerone, on freezing tolerance of three canola cultivars, WRG86, Duobul, and RWC4113.

Chemical	LT <sub>50</sub> (-°C)			Mean
	WRG86	Duobul	RWC4113	
Control† (Oct. 10)	10.3	9.5	12.1	10.6b
Control (Nov. 5)	11.9	12.0	13.0	12.6a
Terpal-C (Nov. 5)	9.2	10.4	11.4	10.3b
Cerone (Nov. 5)	11.7	12.6	13.6	12.3a
Mean	10.8c	11.2b	12.7a	
F-test:	Variety (A)	11.74 (**)		
	Chemical (B)	12.75 (**)		
	A x B	0.75 (ns)		

† Two controls as before chemical treatment (Oct. 10) and after chemical treatment (Nov. 5).

‡ (\*\* and \*\*) significant at 0.05 and 0.01 probability levels, respectively. (ns) not significant at 0.05 probability level.

Table 2. Effect of plant growth regulators, Terpal-C and Cerone, on winter survival of three canola cultivars in 1992-1993.

Chemical	Winter survival(%)			Mean
	WRG86	Duobul	RWC4113	
Control	82.0	80.3	86.0	83.0
Terpal-C	82.0	81.0	90.3	85.0
Cerone	83.0	91.0	95.6	89.0
Mean	80.5	84.3	90.8	
F-test:	Variety (A)	1.160 (ns)†		
	Chemical (B)	0.270 (ns)		
	A x B	1.470 (ns)		

† (\*\* and \*\*) significant at 0.05 and 0.01 probability levels, respectively. (ns) not significant at 0.05 probability level.