

## “Don’t use B-Nine on your vegetable plugs—it’s illegal. Try temperature for height control.”

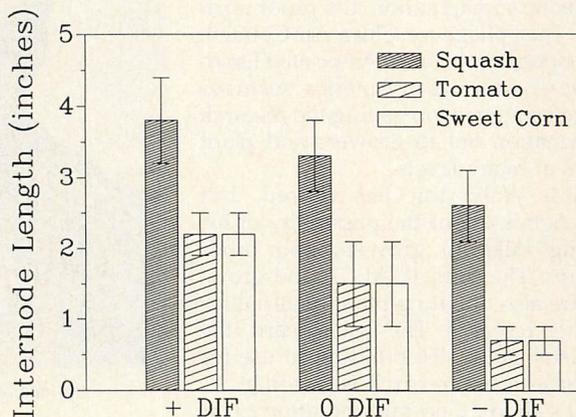
by John Erwin and Royal Heins

Vegetable transplant production represented 8 percent of the bedding and garden plant market in 1988. One of the major problems in producing vegetables as a bedding plant is height control. Traditionally, growers control vegetable height using growth retardants and water and/or nutrient stress. B-Nine was the only labelled growth retardant for use on vegetable transplants, but the controversy surrounding B-Nine use on food crops has resulted in withdrawal of the registration of B-Nine on any food crop. What can you do to control vegetable transplant height without B-Nine?

You can try temperature to control height of some vegetable plants. Recent research shows that temperature has a dramatic effect on plant stem elongation. Specifically, as the Difference (DIF) between day and night temperature (day temperature minus night temperature) increases, stem elongation increases.

### DIF works on vegetables

We grew vegetables under three temperature environments to provide a range of DIF values. The temperature environments were 73 F day temperature/63 F night temperature (positive DIF), 68 F day and night temperature (0 DIF) and



63 F day temperature/73 F night temperature (negative DIF). Each of the different environments had a 12-hour light period, so average daily temperatures within each environment were the same.

Vegetable crops listed in Table 1 respond to DIF. Pea and cucumber were the only vegetables treated that didn't respond, although different pea and cucumber cultivars grown last year responded to DIF. This suggests that some pea and cucumber cultivars may respond to DIF and some may not. We have heard similar reports with petunias also.

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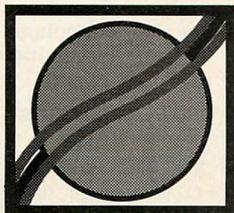
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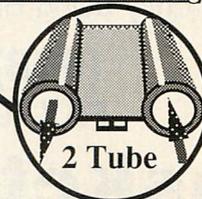
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Table 1: Vegetable plug response to day and night temperatures.

Plant	DIF	Internode length (inches)
Sunny tomato	+	2.2
	0	1.5
	-	0.7
Watermelon	+	1.0
	0	1.4
	-	0.2
Squash	+	3.8
	0	3.3
	-	2.6
Sweet corn	+	2.2
	0	1.5
	-	0.7
Bean	+	1.9
	0	1.6
	-	1.4

## Constant temperature a problem? Try early morning cool pulses

The data presented are from plants that had constant temperatures during the day and night. Constant temperature in the greenhouse, especially during the day, is difficult. Temperatures typically rise in the afternoon. If this is the case in your greenhouse, you may want to consider a cold temperature pulse during the first two hours of the morning.

Research on Easter lily and annual flowering plants suggests that plants are the most sensitive to temperature during the first two hours of the day. If you are able to drop early morning temperatures below the night temperature during the first two to four hours of the day, you'll reduce stem elongation dramatically.

For maximum reduction in stem elongation, drop temperatures during the morning hours as close to first light of day as possible. As daylight increases, a cool temperature pulse treatment has less effect on reducing plant height. Maintaining cool temperatures as long as possible during the day further increases plant response.

One final word: It is illegal to apply any growth retardant to vegetable transplants. Beyond the liability associated with an illegal application, the potential damage to the entire bedding plant industry is immense. Don't use B-Nine on your vegetable transplants this spring!

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John Erwin is assistant professor at the University of Minnesota, St. Paul. Royal Heins is professor at Michigan State University, East Lansing.

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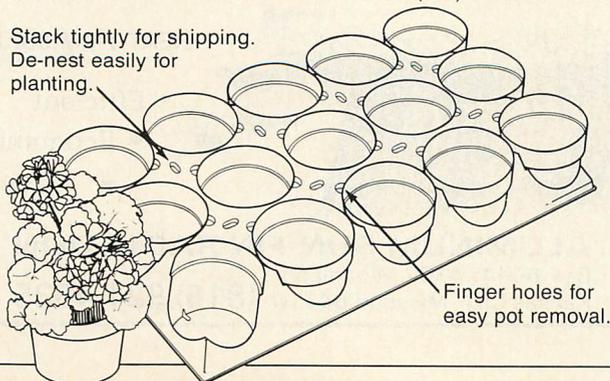
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