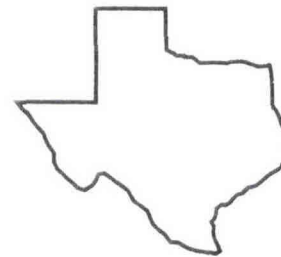
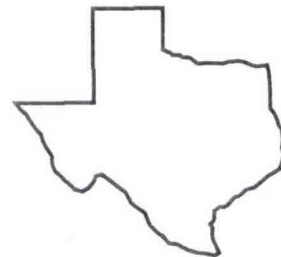
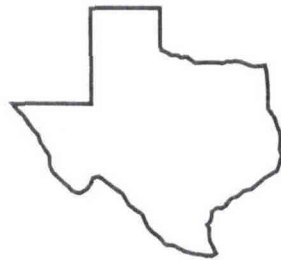
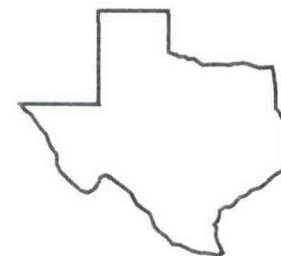


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# EFFECT OF WOOD TYPE ON BLUEBERRY FLOWER BUD CHARACTERISTICS: I. FROST TOLERANCE

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**Background.** Recent spring frosts and freezes have decimated blueberry crops. There are two common ways to mitigate damage; physical protection, using overhead sprinklers, or avoidance, selecting later blooming varieties. This study was initiated to assess frost protection mechanisms within the plant itself.

There are two distinct periods of vegetative growth, early spring and postharvest or late summer. Flower buds for next seasons's crop are formed on both types of current season's growth. Flower buds formed on spring wood are usually visible by July, while buds formed on postharvest growth flushes appear in late summer or early fall (Mainland, 1989). For blueberries, bloom time is directly related to the time of flower bud formation, with buds formed in early summer blooming before those formed in fall (Davies, 1986). By encouraging postharvest growth flushes, it may be possible to delay bloom and thus avoid spring frosts.

**Research Findings.** In this study, flower buds formed on early spring and postharvest growth were evaluated for cold tolerance. Following a freeze of 14°F on February 3, flower buds from each of the two types of wood were examined for dead ovaries. Flower buds surviving the February freeze were later evaluated for their resistance to a 28°F frost on March 23, when flowers were at full bloom. In addition, cold damage to plants was rated 1-5 (1=no damage, 3=50% dead, 5=dead plant) on March 27.

'Delite' flower buds on both spring and postharvest growth were much less cold tolerant than 'Tifblue'. The decrease in cold injury to Delite flowers on postharvest wood versus spring wood was not enough to assure an adequate crop. Season of wood growth greatly affected cold damage on Tifblue plants. Floral buds produced on postharvest growth were much more freeze and frost tolerant than buds initiated on spring growth. The late spring frost on March 23 killed most of the remaining flower buds on Delite, but did not greatly reduce the remaining crop on Tifblue. Stem damage was much more severe on Tifblue than Delite, and for both cultivars, fall growth was more cold tolerant than spring. These results are summarized in Table 1.

**Applications.** These data indicate that postharvest pruning to encourage production of late season growth may be a means of avoiding frost damage. Flowers buds produced on postharvest growth were later blooming by 1-4 weeks than those formed on spring wood. The decrease in cold damage may be associated with the delay in bloom. Similarly, selection of

cultivars is important. Tifblue has been shown to be more cold tolerant than Delite. Cold tolerance of blueberry cultivars will be further investigated.

**Literature Cited.**

Davies, F. S. 1986. Flower position, growth regulators, and fruit set of rabbiteye blueberries. J. Amer. Soc. Hort. Sci. 111:338-341.

Mainland, C. M. 1989. Managing growth and fruit of rabbiteye (*Vaccinium ashei* Reade) blueberries with pruning and growth regulators. Acta Hort. 241:195-200.

Table 1. Cold injury damage on rabbiteye blueberries as a function of cultivar and season of growth.

Cultivar	Season of wood growth	2/3	3/23	
		Freeze damage % Dead ovaries	Frost damage % Dead ovaries	% Stem damage
Tifblue	Spring	50	5	1.25
	Fall	28	0	1.0
Delite	Spring	99	100	3.0
	Fall	89	91	1.9