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Pruning Method Affects Flowering and Sprouting on Crapemyrtle[1]

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Abstract

'Natchez' (*Lagerstroemia indica* × *fauriei*) and 'Carolina Beauty' (*Lagerstroemia indica* L.) crapemyrtle were pruned in three manners including topping, pollarding, and pencil-pruning plus a non-pruned control for four years to determine influence on flowering and sprouting. The topping and pollarding of 'Natchez' delayed appearance of the first flower up to one month compared to non-pruned trees for the first two years following initial pruning. In contrast, topping and pollarding 'Carolina Beauty' induced flowering by as much as one week sooner one and three years following initial pruning with no effect in years two and four. Topping both cultivars delayed peak flowering date compared to non-pruned trees. Topping 'Natchez' the first and second year following initial pruning and pollarding in the second year reduced duration of flowering period compared to the non-pruned trees. Flower effect (panicle number × panicle volume) was not influenced by pruning method on 'Carolina Beauty' for any year. Flower effect for topped 'Natchez' was significantly smaller than for pollarded and pencil-pruned trees the first year after pruning; flower effect on non-pruned 'Natchez' was no different from any of the pruning treatments. Pruning cut diameter was inversely correlated with number of days 'Natchez' trees were in flower, number of flower panicles, and date of flowering; however, cut diameter influence on flower effect was not predictable for 'Carolina Beauty'. Sprouting along the trunk and from the roots increased with diameter of the pruning cut. Topping took less time to complete than other pruning methods in all but the last year which probably accounts for its popularity. Topped trees grew in height following pruning faster than pollarded trees, which grew faster than pencil-pruned trees, which grew faster than non-pruned trees for both cultivars.

Index words: pollarding, topping, heading cuts, pruning type, landscape maintenance.

Significance to the Nursery Industry

This work helps guide pruning programs for crapemyrtle trees in landscapes. Topping delayed peak flowering for both cultivars. Topped 'Natchez' produced fewer panicles and flowered for a shorter period than trees pruned in other manners. Topped trees produced the longest sprouts the following year. Sprouting increased along with pruning severity for both cultivars so that topped and pollarded trees sprouted more than pencil-pruned and trees not pruned. Removing about half the length of current year shoots (pencil-pruning) did not consistently influence sprouting or flowering and resulted in trees with a neat appearance.

Introduction

Several techniques are used to reduce or maintain tree canopy size. Topping uses heading cuts through wood more than several years old to shorten all stems and branches. Pencil-pruning is similar to topping except heading cuts are made through smaller diameter one-year-old branches toward the outer edge of the canopy. Some arborists refer to pencil-pruning as tipping or rounding over. Reduction (5) makes the canopy smaller by shortening stems and branches with reduction cuts back to live lateral branches. Pollarding makes heading cuts through branches up to about three years old and annually removes all or most sprouts back to the original heading cuts (7). Pollarding was used extensively in Europe to maintain trees at a small size (12). Sometimes pollarded trees live longer than non-pollarded trees (9).

Negative effects of topping include increased decay in trees that compartmentalize poorly and sprouting; sprouts on topped trees are reported to be poorly connected (2, 13, 14). Pollarding *Lagerstroemia* × 'Natchez' trees for the first time required more time than topping trees (6). However, time required to top trees increased in each subsequent year; whereas, pollarding time remained the same for each year. Longitudinal sections through stems showed that barrier zones and decay extended farther behind heading cuts on topped trees five years after the initial pruning than cuts on pollarded trees. Topping resulted in a six-fold increase in the volume of wood contained in dead stubs in the canopy compared to pollarded trees. Topping increased the need for cleaning the canopy of dead branches compared to pollarding.

Cutting back or heading all crapemyrtle stems in the nursery to encourage sprouting is common practice in production horticulture (1). Rounding over the canopy of crapemyrtle in landscapes using heading cuts through one- to three-year-old wood is common in the southern United States. Topping the canopy with heading cuts through older wood is also common. These landscape practices apparently are based on tradition since there is little research supporting or refuting this as good horticultural practice.

The purpose of this research was to determine how various pruning methods including topping, pollarding and pencil-pruning affected flowering and sprouting on crapemyrtle.

Materials and Methods

A total of 40 0.7 to 1.0 m (2.3 to 3 ft) tall *Lagerstroemia indica* × *fauriei* 'Natchez' and 40 (37 survived) *L. indica* 'Carolina Beauty' were planted from #5 containers into Leefield fine sandy soil (USDA hardiness zone 8a) on 6 m (19 ft) centers near Tallahassee, FL, in February 1994. All replicates of like cultivars were grouped on one side of the field, so comparisons between cultivars were not a designed

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part of this study. Trees were irrigated and fertilized regularly to encourage growth. All 77 surviving trees were pruned to develop 3 to 5 main stems and remove dead, rubbing, and crossing branches in March 1998 when 'Natchez' averaged 4.4 m (14.5 ft) tall and 4.3 m (14.2 ft) wide and 'Carolina Beauty' averaged 3.5 m (11.6 ft) tall and 2.4 m (7.9 ft) wide. Later that month, trees were submitted to one of four pruning treatments: no pruning, pencil-pruning, pollarding, or topping. Pruning treatments were applied just prior to new growth in March 1998, 1999, 2000 and 2001. Only small low branches on trees in the non-pruned treatment were removed to allow for clearance under the canopy. These same branches were also removed from all other trees in the study. Time to prune each tree was recorded each year.

Each of the four pruning methods was applied to one tree in each of nine ('Carolina Beauty') or ten ('Natchez') blocks. Pruning methods were randomly assigned to trees within each block. The first pruning in March 1998 made heading cuts through two- to three-year-old wood [18 mm (0.7 in) diameter] 1.8–2.4 m (6–8 ft) from the ground on the pollarding treatment, and through four- to five-year-old wood [27 mm (1.1 in) diameter] 1.2–1.5 m (4–5 ft) from the ground on the topping treatment. The number of visible growth increments determined age of the cut stems. The entire top portion of each pollarded or topped tree was removed.

Initial pollarding in March 1998 removed some main branches back to main stems so that the cut ends of headed stems were at least 30 cm (12 in) apart to allow access to ample sunlight. All sprouts on pollarded trees were removed each winter back to the point of the original heading cut. Swollen woundwood and callus tissue (referred to as a pollard head) developed at this point on all pollarded trees. The pollard head was not cut into on pollarded trees. Sprouts originating from behind the cuts were removed back to the pruned parent stem at each annual pruning.

Heading cuts on topped trees in the second, third and fourth years were made through the one-year-old sprouts that grew from last year's heading cuts. Cuts were made 15–20 cm (6–8 in) distal to heading cuts made the previous year (6). The location of buds along the cut stems was not considered in choosing the position of heading cuts; cuts were positioned to present a uniform canopy following pruning similar to what is commonly performed in southern landscapes.

Pencil-pruning made heading cuts through the most recent year's twigs so that approximately 20 cm (8 in) remained; this treatment removed all old fruit capsules. The resulting tree crown was uniformly shaped. Slow-growing short lateral shoots and interior branches were not pruned unless they had a fruit cluster in which case they were shortened with a heading cut.

All sprouts were removed from each tree in July 1998, September 1999, July 2000, and August 2001. The number and origin of sprouts removed, and the total pruning time were recorded for each tree at each of the de-sprouting sessions. Sprouts were categorized as basal sprout if removed from the lower 15 cm (6 in) of the trunk or emerging from the soil within a 15 cm (6 in) radius around the trunk base, as root sprout if removed from the soil more than 15 cm (6 in) away from the base of the trunk; or as stem sprout if removed from the trunk 15 cm (6 in) above the soil to 0.3 m (1 ft) below pruning cuts in topped and pollarded trees, and up to 1.35 m (4.5 ft) in 'Natchez' and 0.9 m (3 ft) in 'Carolina Beauty' pencil-pruned and not pruned trees.

The height and width of each tree were measured immediately following each pruning session and also in September 1998, 1999 and 2000 following cessation of growth. Time required to prune and number of pruning cuts on each tree were recorded for all four years; the diameter of 10 pruning cuts per tree was measured for the first three years.

All trees were evaluated for number of panicles weekly from bloom start to finish for all four years. We reported mean date of first flower, mean date of maximum panicle number (peak flowering), and duration of flowering for each pruning method annually for four years. Panicle dimensions were determined the first 3 years by measuring the width (at the widest part) and length from base to tip of 5 panicles per tree on the date of maximum panicle number for each treatment. Volume was subsequently calculated for each panicle using the formula of a cone [$1/3\pi \times (1/2 \text{ width})^2 \times$ length]. Flower effect was calculated as the average panicle volume multiplied by the panicle count, and was calculated for each tree weekly during the flowering season for 1998, 1999 and 2000. Total flower effect was the sum of weekly flower volumes for an entire year.

Trees were arranged in a randomized complete ('Natchez', 40 trees) or incomplete ('Carolina Beauty', 37 trees) block design by cultivar. Data for each cultivar separately (cultivars were not directly compared in the statistical analysis) were subject to two-way ANOVA using the repeated measures GLM procedure in SAS in a randomized block design with one pruning method replicate per block. The within-subjects factor was year and the main fixed effect was pruning method. Mean separation at $P < 0.05$ was performed using Duncan's multiple range test.

Results and Discussion

The topping and pollarding pruning methods on 'Natchez' delayed appearance of the first flower up to one month compared to non-pruned trees for the first two years following initial pruning (Fig. 1B). However, there was no effect of pruning method on date to first flowering three and fours years following initial pruning. Similar to *Prunus* grown for fruit production (10), flowering on topped and pollarded trees may have been delayed until the tree stored enough energy to place resources into flower production. Pencil-pruning did not affect date of first flowering compared to the non-pruned trees in any year. Heading only last season's shoots (similar to our pencil-pruning) also had little effect on *Prunus* and *Malus* flowering (11).

In contrast, topping and pollarding 'Carolina Beauty' induced flowering by as much as one week sooner one and three years following initial pruning with no effect in years two and four (Fig. 1A). We have no explanation why the two cultivars responded differently. Fewer differences in date of first flowering among pruning methods in the later years for both cultivars could be explained by the smaller diameter wood removed in the later years compared to the first year in the topping and pollarding treatments (Table 1).

Topping delayed peak flowering date about 2 weeks the first year after initial pruning for 'Carolina Beauty' compared to all other pruning methods including the non-pruned trees (Fig. 1A). Topping 'Natchez' delayed peak flowering 16 days in the first year following initial pruning and 30 days in the second year compared to non-pruned trees (Fig. 1B). In contrast, topping in the fourth year induced peak flowering 8 days earlier compared to not pruning. Pollarding delayed

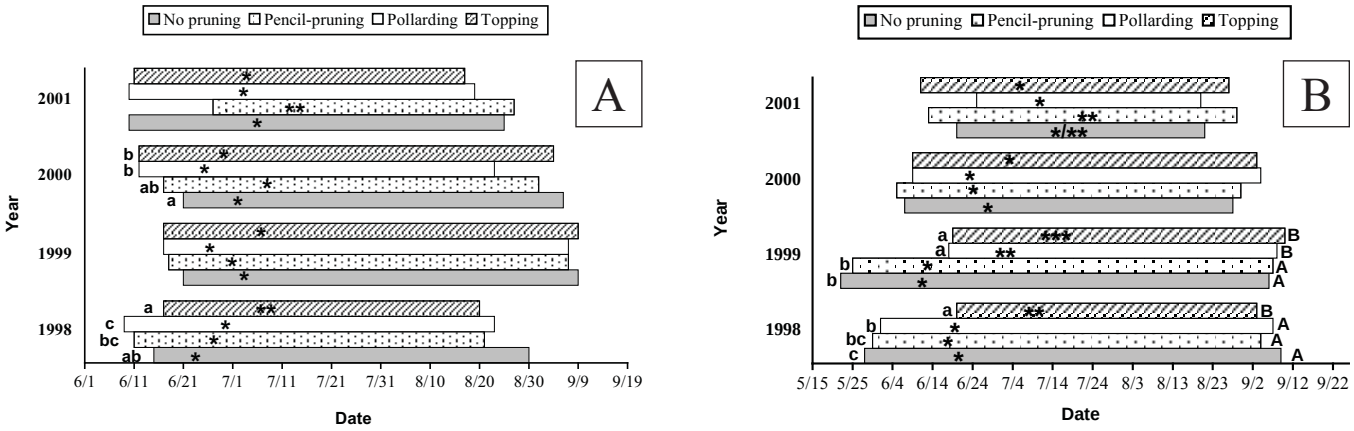

Fig. 1. Mean date of first flower (beginning of bar), mean date of maximum panicle number (location of asterisk), and mean duration of flowering (length of bar) of A) 'Carolina Beauty' and B) 'Natchez' crapemyrtle following four pruning methods in four consecutive years. No pruning = trees not pruned; pencil-pruning = one-year-old stems cut; pollarding = stems removed back to same position each year; topping = stems cut 15–20 cm (6–8 in) beyond heading cuts made the previous year. Different letters and different number of asterisks denote dates significantly different within a year at $P < 0.05$ using Duncan's MRT. Lowercase letters refer to date of first flower. Asterisks indicate date of maximum panicle number. Uppercase letters refer to duration of flowering (there were no differences for 'Carolina Beauty').

peak flowering date 18 days compared to non-pruned trees in the second year but had no influence in the other years. Pencil-pruning delayed peak flowering one week in the fourth year on 'Carolina Beauty' compared to non-pruned trees, and one to two weeks compared to topping and pollarding for both cultivars.

Pruning method had no influence on duration of flowering on 'Carolina Beauty' (Fig. 1A). However, topping 'Natchez' the first and second year following initial pruning and pollarding in the second year reduced duration of flowering period compared to the non-pruned trees (Fig. 1B). Pencil-pruning did not impact duration of flowering for either cultivar. Duration of 'Natchez' flowering reduced from year one through year four, perhaps due to exceptional drought in the last two years of the study (2000–2001). This did not occur for 'Carolina Beauty'.

Flower effect was not influenced by pruning method on 'Carolina Beauty' for any year (Fig. 2A, B, C). Total flower effect for topped 'Natchez' was significantly smaller than for pollarded and pencil-pruned trees the first year after pruning; flower effect on non-pruned 'Natchez' was no different from any of the pruning treatments (Table 2, Fig. 2D, E, F). Flower effect on topped 'Natchez' was less than both pencil-pruned and non-pruned trees the second year after initial pruning. Flower effect differences among treatments were not significant the third year perhaps because cut diameter on topped trees decreased with each year; whereas, diameter of cuts on other treatments remained the same (Table 1).

There was an inverse relationship between diameter of the pruning cut and the number of days 'Natchez' (across all 40 trees in the study) trees were in flower (r = –0.73, year 1), the number of flower panicles (r = –0.76, year 1; r = –0.87, year 2), and the date to flowering (r = –0.81, year 1). However, there was no relationship for 'Carolina Beauty' between mean pruning cut diameter (across all 37 trees in the study) and flower duration, flower number, or date to first flower.

Sprouting along the trunk and from the roots was influenced by pruning method. Pollarding increased number

Table 1. Number of pruning cuts and cut diameter on 'Carolina Beauty' and 'Natchez' crapemyrtle made during four pruning methods.

	1998		1999		2000		2001[y]
Pruning method[z]	No. cuts	Cut diam.	No. cuts	Cut diam.	No. cuts	Cut diam.	No. cuts
'Carolina Beauty'							
No pruning	0.0d[x]	0.0d	0.0d	0.0d	0.0d	0.0d	0.0d
Pencil-pruning	105.0a	5.4c	116.0a	5.0c	200.0a	5.5b	144.0b
Pollarding	44.0b	15.7b	70.0b	12.5a	150.0b	14.6a	213.0b
Topping	17.0c	21.4a	35.0c	11.5b	60.0c	14.4a	314.0a
'Natchez'							
No pruning	0.0c	0.0d	0.0d	0.0d	0.0c	0.0d	0.0c
Pencil-pruning	196.0a	6.6c	282.0a	5.6c	564.0a	5.8c	425.0a
Pollarding	44.0b	21.1b	64.0b	20.1a	168.0b	20.8a	248.0b
Topping	9.0c	32.0a	31.0c	18.8b	55.0c	17.0b	292.0b

[z]No pruning = trees not pruned; pencil-pruning = one-year-old stems cut; pollarding = stems removed back to same position each year; topping = stems cut 15–20 cm (6–8 in) beyond heading cuts made the previous year.

[y]Cut diameter was not collected in 2001.

[x]Means within a column and cultivar followed by different letters are significantly different at $P < 0.05$ using Duncan's MRT.

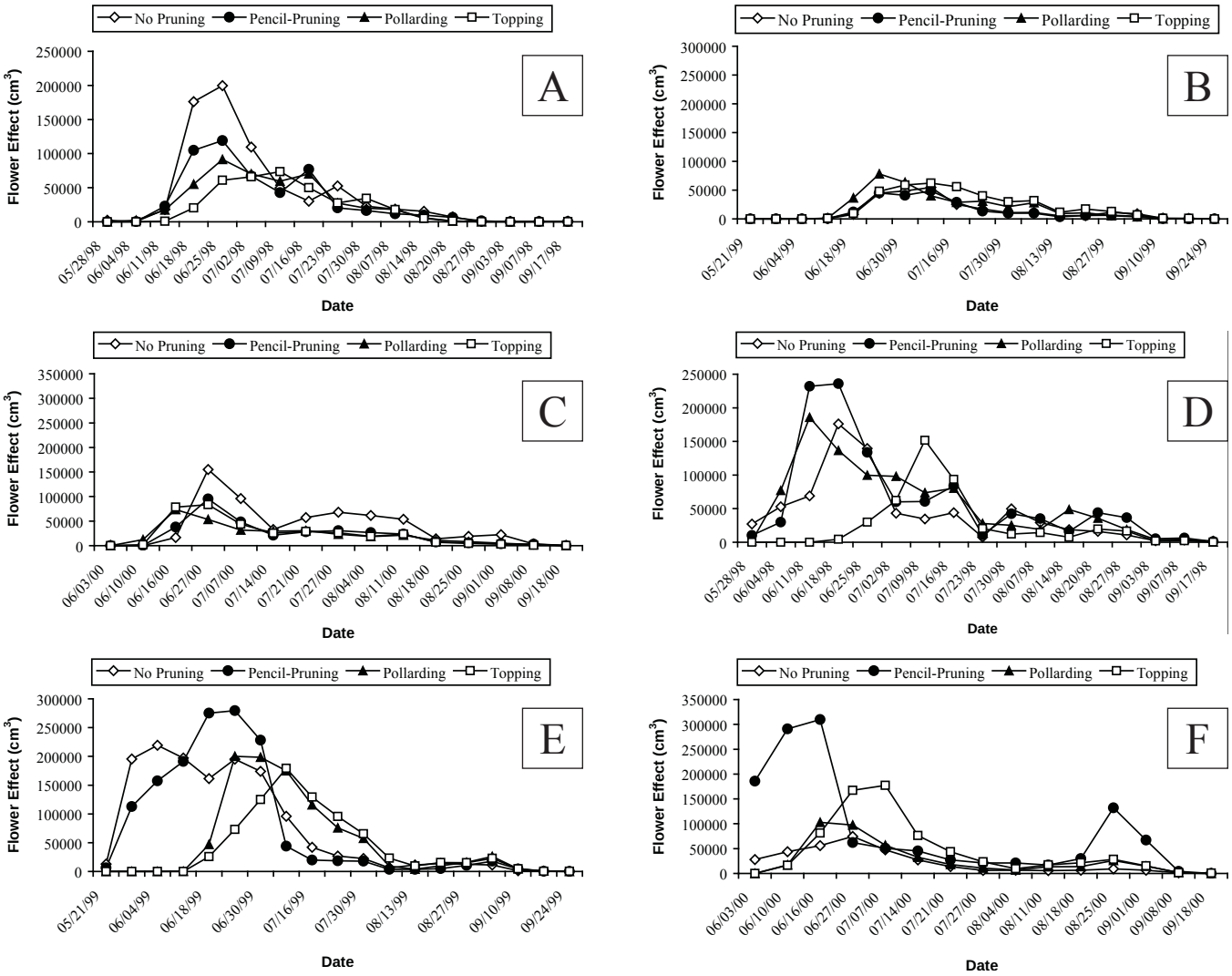

Fig. 2. Flower effect (total number of panicles × average panicle volume = cm³) of 'Carolina Beauty' crapemyrtle following four pruning methods in A) 1998, B) 1999, C) 2000 and 'Natchez' crapemyrtle in D) 1998, E) 1999 and F) 2000. No pruning = trees not pruned; pencil-pruning = one-year-old stems cut; pollarding = stems removed back to same position each year; topping = stems cut 15–20 cm (6–8 in) beyond heading cuts made the previous year.

Table 2. Total flower effect[z] for 'Carolina Beauty' and 'Natchez' crapemyrtle following four pruning methods.

Pruning method[y]	1998	1999	2000
'Carolina Beauty'			
No pruning	704,638	254,096	542,756
Pencil-pruning	500,401	231,217	304,322
Pollarding	438,845	357,531	289,858
Topping	357,998	388,259	317,933
'Natchez'			
No pruning	726,144ab[x]	1,399,849a	319,007
Pencil-pruning	1,044,773a	1,395,905a	1,236,876
Pollarding	937,373a	940,378ab	394,279
Topping	437,145b	785,033b	636,556

[z]Total number of panicles counted during the flowering season × average panicle volume = cm³.

[y]No pruning = trees not pruned; pencil-pruning = one-year-old stems cut; pollarding = stems removed back to same position each year; topping = stems cut 15–20 cm (6–8 in) beyond heading cuts made the previous year.

[x]Flower effect means within a column and cultivar followed by different letters are significantly different at $P < 0.05$ using Duncan's MRT.

of sprouts that emerged from roots in 'Carolina Beauty' compared to the non-pruned trees; this occurred only in the first year following initial pruning (Table 3). Pruning method had little or no influence on 'Natchez' root sprouting in any year. Number of basal sprouts on 'Carolina Beauty' remained unaffected by pruning method. Topped 'Natchez' generated more basal sprouts than non-pruned and pencil-pruned trees, but only in the first year.

Pollarded trees of both cultivars generated more stem sprouts than non-pruned and pencil-pruned trees in all four years (Table 4). Topped trees of both cultivars also generated more stem sprouts than non-pruned and pencil-pruning trees but only for the first two years after initial pruning. The total number of sprouts emerging from the trunk and roots across all four pruning treatments increased significantly *(P* < 0.01) as diameter of the pruning cut increased ('Natchez': r = 0.69 year 1, r = 0.59 year 3; 'Carolina Beauty': r = 0.68 year 1, r = 0.57 year 2). Pencil-pruning removed the smallest amount of wood of the three pruning treatments (Table 1) and resulted in no more sprouts than non-pruned trees throughout the duration of the four year study. Apparently

Table 3. Number of basal and root sprouts for 'Carolina Beauty' and 'Natchez' crapemyrtle following four pruning methods.

	1998		1999		2000		2001	
Pruning method[z]	Basal	Root	Basal	Root	Basal	Root	Basal	Root
'Carolina Beauty'								
No pruning	0.8	1.8b[y]	10.1	18.2	14.4	27.1	15.3	54.8
Pencil-pruning	2.3	0.3b	3.7	10.6	5.9	18.3	4.5	35.5
Pollarding	1.2	12.6a	10.1	12.0	31.8	23.4	25.1	16.5
Topping	3.3	3.0ab	2.9	2.5	5.9	8.3	9.1	17.7
'Natchez'								
No pruning	0.0b	0.0	0.7	3.9	1.2	1.0a	16.9	4.6
Pencil-pruning	0.0b	0.3	1.8	18.0	1.4	0.0b	0.7	0.0
Pollarding	2.1ab	0.0	0.1	0.0	0.7	0.0b	1.5	6.2
Topping	6.5a	0.0	3.6	0.0	4.3	0.0	1.3	2.0

[z]No pruning = trees not pruned; pencil-pruning = one-year-old stems cut; pollarding = stems removed back to same position each year; topping = stems cut 15–20 cm (6–8 in) beyond heading cuts made the previous year.

[y]Means within a column and cultivar followed by different letters are significantly different at $P < 0.05$ using Duncan;s MRT.

pencil-pruning removed less than the threshold of wood required to stimulate sprouting; whereas, pollarding and topping removed large enough quantities of wood and buds to cause excessive sprouting. Others found increased sprouting with increased pruning cut diameter (3) and amount of wood removed (4, 15). Sprouting along the lower trunk and from roots is a major problem for anyone maintaining crapemyrtle because customers want them removed; our data show that at least some of this can be attributed to heavy pruning. De-sprouting requires only slightly less time than topping or pollarding 'Carolina Beauty' but much less time than topping or pollarding 'Natchez' (Fig. 3A, B). De-sprouting can require one or more visits to the tree each growing season according to some arborists. Light pruning such as cutting in half most of last seasons shoot growth (pencil-pruning) appears to dramatically reduce sprouting compared to topping and pollarding and should reduce required maintenance on crapemyrtle.

The longest new shoots emerged from just behind the heading cuts made on topped and pollarded trees. These were the unbranched shoots that eventually developed flowers on this determinate flowering tree. Sprouts grew straight up before bending under their own weight to orient themselves to access more sunlight; bending was pronounced following a rain event when trees were flowering. This was much less evident on pencil-pruned trees, although a few upright sprouts grew from just behind the cut on the larger diameter pencil-pruning stems. These were mostly unnoticeable as sprouts because they were hidden in the canopy of the tree.

Table 4. Number of stem sprouts for 'Carolina Beauty' and 'Natchez' crapemyrtle following four pruning methods.

Pruning method[z]	1998	1999	2000	2001
'Carolina Beauty'				
No pruning	4.3c[y]	7.2b	12.0b	6.2b
Pencil-pruning	6.4c	1.2b	3.0b	2.3b
Pollarding	76.9a	74.8a	135.0a	85.8a
Topping	43.8b	77.1a	33.0b	14.0b
'Natchez'				
No pruning	7.7b	1.7b	0.2b	0.0b
Pencil-pruning	8.4b	0.1b	0.1b	0.0b
Pollarding	53.9a	37.4a	19.1a	27.8a
Topping	47.1a	36.7a	4.4b	5.1b

[z]No pruning = trees not pruned; pencil-pruning = one-year-old stems cut; pollarding = stems removed back to same position each year; topping = stems cut 15–20 cm (6–8 in) beyond heading cuts made the previous year.

[y]Dates within the column and cultivar followed by different letters are significantly different at $P < 0.05$.

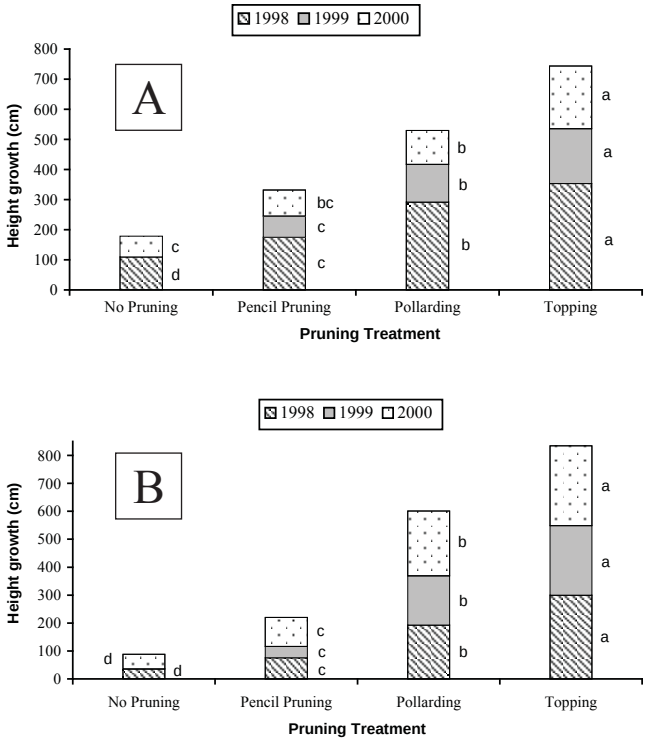

Fig. 3. Seasonal height growth for A) 'Carolina Beauty' and B) 'Natchez' crapemyrtle following four pruning methods in three consecutive years. Seasonal height growth from immediately after pruning through the fall of that year. No seasonal height growth data collected for the "no pruning" treatment in 1999. No pruning = trees not pruned; pencil-pruning = one-year-old stems cut; pollarding = stems removed back to same position each year; topping = stems cut 15–20 cm (6–8 in) beyond heading cuts made the previous year. Growth in one year followed by a different letter indicates a significant difference from other pruning treatments of the same year ($P > 0.05$).

Cut diameter on topped trees in years two and three was less than in the first year after initial pruning of both cultivars because shoots cut in those years were smaller in diameter ($P < 0.01$) than the original four- to five-year-old stems cut in the first year of the study (1998, Table 1). In contrast, cut diameter on pollarded trees was fairly consistent from year to year; in other words shoots in years two and three were the same size as the original heading cuts. Heading cuts on pollarded trees in year one were smaller in diameter than heading cuts on topped trees because cuts were made higher on the trees.

Topping took less time to complete than other pruning methods in all but the last year (Fig. 4A, B). This probably accounts for its popularity in landscapes; it is a quick and efficient method of removing stems. Pollarded trees required about the same time to prune (not including de-sprouting time) each year; whereas, time required to pencil-prune increased each year (except for the last year, Fig. 4). Time required to top both cultivars increased each year but most dramatically in the last year of the study (2001) because there were so many pruning cuts to make in that year compared to prior years (Table 1). Increased pruning time resulted from the many shoots that emerged from prior year's cuts. Some people in the fourth or fifth year of topping in this manner choose to top the tree below the original heading cut. This removes all shoots that emerged since the original heading cut and saves time compared to making so many heading cuts higher on the tree.

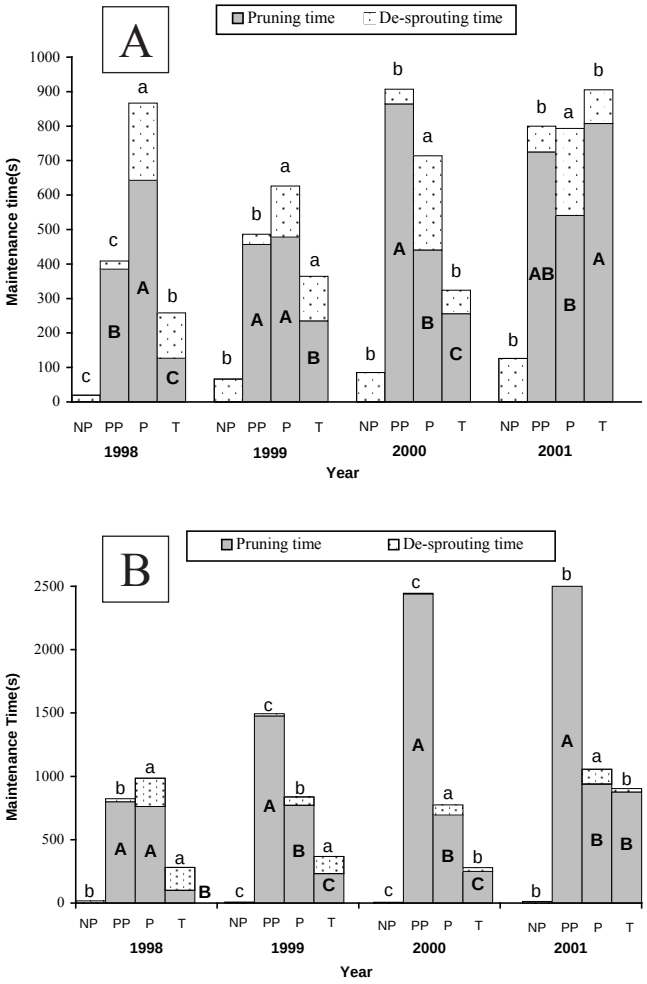

Fig. 4. Maintenance time (seconds) required for not pruned (NP), pencil-pruning (PP), pollarding (P) and topping (T) for A) 'Carolina Beauty' and B) 'Natchez' crapemyrtle in four consecutive years. Maintenance time is the sum of pruning time and de-sprouting time. No pruning = trees not pruned; pencil-pruning = one-year-old stems cut; pollarding = stems removed back to same position each year; topping = stems cut 15–20 cm (6–8 in) beyond heading cuts made the previous year. Bars with different letters denote means significantly different at $P < 0.05$. Uppercase letters compare pruning time among pruning treatments for each year. Lowercase letters compare de-sprouting time among pruning treatments for each year.

Table 5. Tree height (cm) in the fall of each year for 'Carolina Beauty' and 'Natchez' crapemyrtle following four pruning methods in the spring.

Pruning method[z]	1998	1999	2000
'Carolina Beauty'			
No pruning	353.4a[y]	392.0a	465.4a
Pencil-pruning	291.8b	359.2a	421.4a
Pollarding	174.5c	290.9b	290.0b
Topping	109.9d	292.1b	313.5b
'Natchez'			
No pruning	468.6	459.5a	547.3a
Pencil-pruning	459.1	444.3a	532.8a
Pollarding	456.4	426.8ab	471.1b
Topping	438.0	407.1b	461.3b

[z]No pruning = trees not pruned; pencil-pruning = one-year-old stems cut; pollarding = stems removed back to same position each year; topping = stems cut 15–20 cm (6–8 in) beyond heading cuts made the previous year.

[y]Means within a column and cultivar followed by different letters are significantly different at $P < 0.05$ using Duncan's MRT.

Topped trees following pruning grew in height faster than pollarded trees, which grew faster than pencil-pruned trees, which grew faster than non-pruned trees for both cultivars (Fig. 3A, B). The exception was for 'Carolina Beauty' in the third year when there was similarity in growth among pencil-pruned, non-pruned and pollarded trees. This indicates that the pruning treatments resulting in the largest pruning cuts produced the most re-growth. Lighter pruning resulted in less sprouting and regrowth. This explains why the use of topping appears to have been greatly reduced as a pruning technique for clearing power lines. Nonetheless, fall heights of pollarded and topped 'Carolina Beauty' were less than non-pruned and pencil-pruned plants in years one through three (Table 5). Fall heights of pollarded and topped 'Natchez' were less than non-pruned and pencil-pruned plants in years two and three.

Pollarding maintained crapemyrtle at a set height, and resulted in a predictable flower display each year with little stem decay (6). This time-honored practice has been documented for at least 300 years (8) but is likely to have a much longer history. In contrast, topping crapemyrtle in this study and in landscape practice allows trees to grow slightly larger each year, but flower number declined dramatically compared to other treatments. More dead stubs filled the crown after topping compared to pollarding (6). Eventually, many property managers remove the tangle of old dead stubs every few years making huge heading cuts slightly below the initial heading cut. Large heading cuts are associated with decay (6, 14). Pencil-pruning annually removed last

year's unattractive brown fruits with little effect on flowering without stimulating root and stem sprouts compared to non-pruned trees.

Pollarding might be the most convenient method of keeping crapemyrtles small because unlike topping, the height at which annual cuts are made remains fixed. This makes it easy to replicate resulting in a more predictable appearance. Some horticulturists suggest that the best method for reducing pruning costs is to choose a cultivar that grows to the desired size, and this is a good method to minimize maintenance. However, I suspect that the unsightly nature of the seed heads at the tips of branches would lead many property owners to prune crapemyrtles of any size in some fashion.

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