The Effect of Transplanting Date on the Growth of Three Evergreen Shrubs in Containers

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INTRODUCTION

Producers of woody plant material have consistently worked toward finishing stock in the shortest possible time while maintaining high quality. In the South Jersey area, container growers have noted the combination of a large vigorous liner, early transplanting date, and high fertility contribute to the profitable production of such stock.

Appleton and Whitcomb (1983) indicated that an early transplanting date has a positive effect on the growth of deciduous tree seedlings, but it was less important on evergreen tree seedlings as suggested by Whitcomb, et al.(1977).

This study was conducted to determine the effect on growth over five transplant dates.

MATERIALS AND METHODS

Rooted cuttings of *Rhododendron* 'Hino-crimson' (hino crimson azalea), *Juniperus conferta* 'Blue Pacific', and *Taxus ×media* 'Densiformis' were potted at approximately 15-day intervals from 18 May through 14 July in #2 nursery containers. Each of the five treatments was replicated 20 times.

The medium was a peat, vermiculite, and sand mix (45 : 45 : 10, by volume) and was amended with 2.97 kg m^{-3} (5 lb yd^{-3}) of dolomitic lime and 0.15 kg m^{-3} (4 oz yd^{-3}) of a fritted trace element material containing 5% manganese, 14% iron, 1.5% copper, 5% zinc, 0.8% boron, and 0.07% molybdenum. The major nutrients were supplied as a 20-20-20 soluble fertilizer containing micronutrients applied at the rate of 200 ppm nitrogen twice a week. The plants were grown in an open 14 ft × 100 ft nursery storage house and later overwintered in the same house with a single-layer white polyethylene cover.

All plants were measured on 26 April of the following year using the formula: width+width+height/3=overall size. The results were then evaluated to determine the least significant difference at the 5% level. Where mortality existed, average values were inserted and treatments were then further evaluated to determine if there was significance for mortality in the treatments.

RESULTS

Azaleas potted after mid May showed a significant reduction in overall growth when compared with all other treatments. Growth was also reduced with each subsequent planting date, which supports the position that azaleas should be transplanted at the earliest possible date (Table 1, Figure 1).

The influence of the earliest transplanting of juniper showed less positive effect than with azalea, although when transplanted later than early June growth of juniper was significantly reduced. Like the azalea, each subsequent date after the initial significant reduction in growth resulted in further reductions in growth.

Table 1. Top growth of plants transplanted at various dates.

Transplant date	*Rhododendron* 'Hino-crimson'	*Juniperus conferta* 'Blue Pacific'	*Taxus ×media* 'Densiformis'
18 May	35.05 (13.80)[z] a[y]	22.25 (8.76) a[y]	15.49 (6.10) a[y] a[x]
2 June	33.68 (13.26) ab	22.30 (8.78) a	15.34 (6.04) a a
16 June	32.89 (12.95) b	16.00 (6.30) b	13.92 (5.48) b a
31 June	31.37 (12.35) c	12.78 (5.03) c	14.50 (5.71) ab a
4 July	29.46 (11.60) d	10.80 (4.25) c	14.99 (5.90) ab b

[z] Centimeters (inches).
[y] Means within columns followed by the same letter are not significantly different at the 5% level.
[x] Significance at the 5% level for increased mortality.

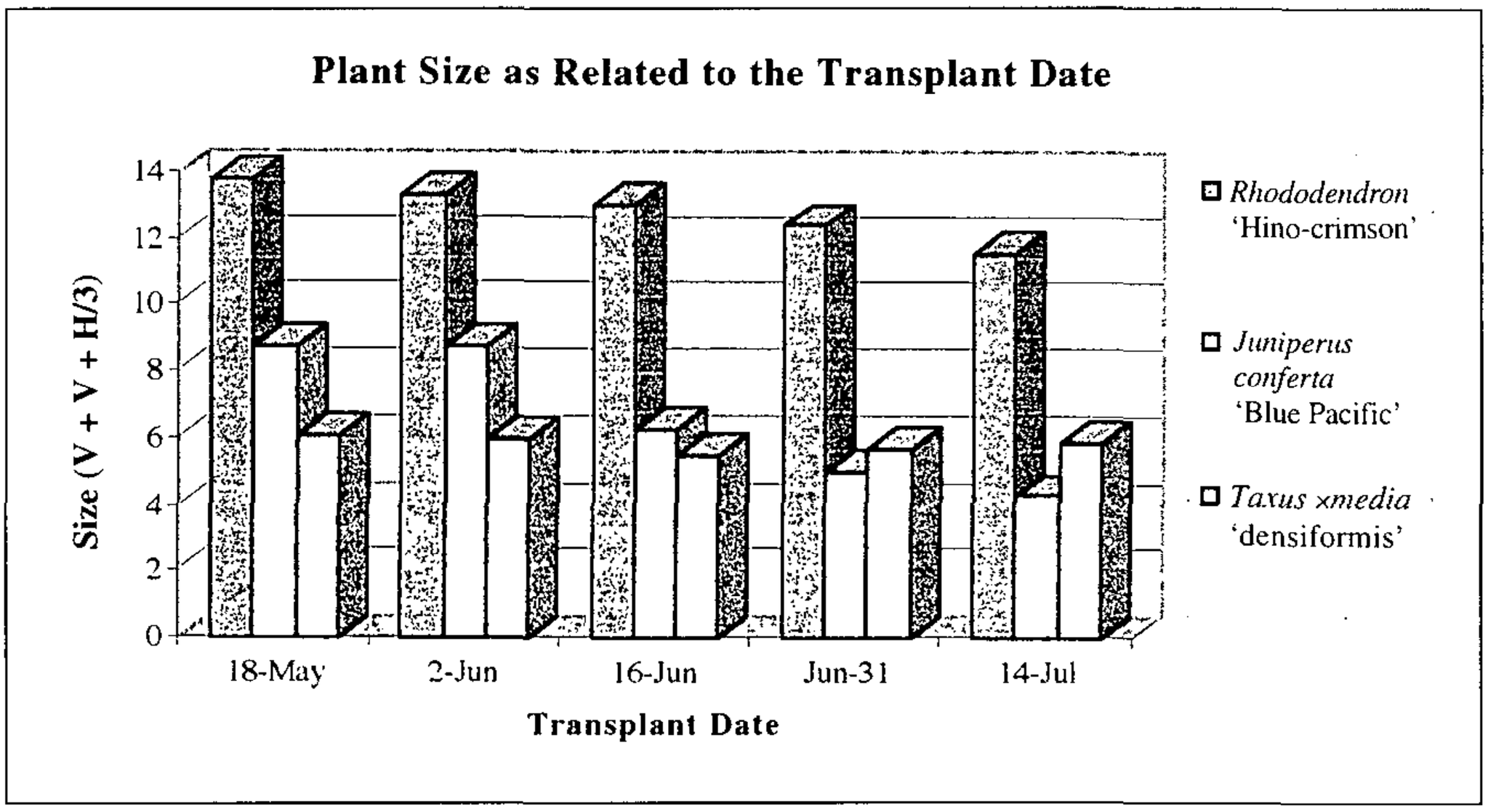

Figure 1. Plant size as related to the transplant date.

Taxus performed similarly to the juniper with respect to early transplanting but differently from either the azalea or the juniper on later dates. There was no benefit from a mid May transplant date over the early June date. Transplanting after early June resulted in a significant reduction of growth from the earlier transplant dates, but growth did not continue to decline on later transplant dates. While maintaining a plateau of growth during later dates, there was a significant increase in mortality by mid July.

DISCUSSION

It was noted that the two narrow-leaved evergreen species showed a significant decrease in growth after an early June transplant date, while the broad-leaved evergreen species reacted positively to an earlier transplant date. It is possible that the azalea may exhibit continued positive response to a transplant date earlier than that of 18 May. The cause of the later decrease in growth response for the narrow-leaved evergreens can only be speculated. It is possible that high root temperatures may have caused the growth inhibition. Narrow-leaved evergreens are generally accepted to be more heat tolerant than broad-leaved evergreens, and the early decline in azalea growth based on transplant date appears to support that concept. In *Petunia hybrida*, high temperature inhibition occurred at medium temperatures above 24C (75F) (Merritt and Kohl Jr., 1982). The sun readily warms a peat-lite medium because of its dark surface, and temperatures exceeding 43.3C (110F) have been recorded by area growers.

SIGNIFICANCE TO THE NURSERY INDUSTRY

This study indicates the importance of transplanting rooted cuttings early for best vegetative growth of the species tested. These results also indicate the need for further research observing the effect of root temperatures on the overall growth of woody ornamentals. Optimum transplanting dates for other plant genera and species should be developed as well. In a time when profitability is strongly related to the crop cycle time, maximum vegetative growth and therefore an early transplant date is a key to profitability.

LITERATURE CITED

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