

## Seed Propagation And Production of *Trillium grandiflorum*

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### INTRODUCTION

The genus *Trillium* is widely known and long recognized as one of the most beautiful components of the spring woodland wildflower garden. There are approximately 35 species native to the eastern U.S. Of these, roughly 10 species are offered for sale by wholesale nurseries. In recent years conservationists have raised concerns about the source of these plants. Reports indicate that nursery propagation by seed is rare, most trillium rhizomes are wild collected.

### Research Goals at Mt. Cuba Include:

- Recognizing the need for and benefits of propagating native species in the nursery.
- Determining the most cost effective and labor efficient methods of doing so.
- Selecting exceptionally attractive, easily cultivated species.

### Supporting Marketing Strategies Might Include:

- Emphasizing the desirability of purchasing healthy, vigorous, flowering-sized plants that have been established in containers and are well adapted for survival in the landscape.
- Promoting the conservation benefits of nursery grown plants.
- Promoting the image of difficult-to-propagate native plants as garden perennials with appropriate market value.

### MATERIALS AND METHODS

*Trillium grandiflorum* berries (approximately 10,000 seeds) were collected on 8 July 1991 from the G. Richard Thompson Wildlife Management Area near Linden, Virginia with permission from the Commonwealth of Virginia Department of Game and Inland Fisheries. They were cleaned and planted in a 5 ft × 10 ft bed filled with sterilized soil and Promix BX (1 : 1, v/v) on July 10, 1991. The bed was watered, covered with a 1-inch layer of pine straw followed by landscape fabric to conserve moisture and discourage the establishment of weeds. The landscape fabric was removed the following spring; by early May approximately 50 seedlings had appeared. The bed was watered and weeded as necessary until November when the landscape fabric was reapplied. By early April 1993 additional seedlings had emerged bring the total number to approximately 2000. Shadecloth (30%) was added due to early seedling dieback from excessive sunlight. Subsequent care included the yearly removal of landscape fabric in March and its reapplication in November. The bed was fertilized in April 1994, 1995, and 1996 with Agriform 14-4-6 at the lowest recommended rate. The bed was checked weekly for watering and weeding needs.

In early September 1996 all plants were lifted: the foliage was removed and their rhizomes were weighed and 1000 plants were planted into individual 3-5/8 × 5-1/2-

inch tree bands, 25 bands per flat. There was a total of 40 flats, subdivided into groups of 10 flats. In Weight Class 1 the rhizomes weighed .10 to 1.25 g, in Weight Class 2 the rhizomes weighed 1.26 to 2.99 g, in Weight Class 3 the rhizomes weighed 3.00 to 5.30 g and in Weight Class 4 the rhizomes weighed 5.31 to 14.62 g. Five flats of each weight class received Agriform 14-4-6 fertilizer in March 1997 at the rate of 3 oz per band. Data was collected on stem number, leaf number, and flower number for each plant.

## RESULTS

Approximately 50 seedlings germinated 11 months after sowing (April 1992). By 23 months approximately 2000 seedlings germinated following sowing (April 1993). Small numbers of seedlings, recognizable by a single linear leaf, were observed each spring thereafter.

First flowering began after 4 years; flowering was initiated in May 1995 with 14 flowers appearing. Flowering was correlated to rhizome weight, and by May 1997 approximately 85% of rhizomes over 3.00 g produced 1 or 2 flowers (Fig. 1).

Leaf number and stem number also were correlated with rhizome weight (Figs. 1 and 2.).

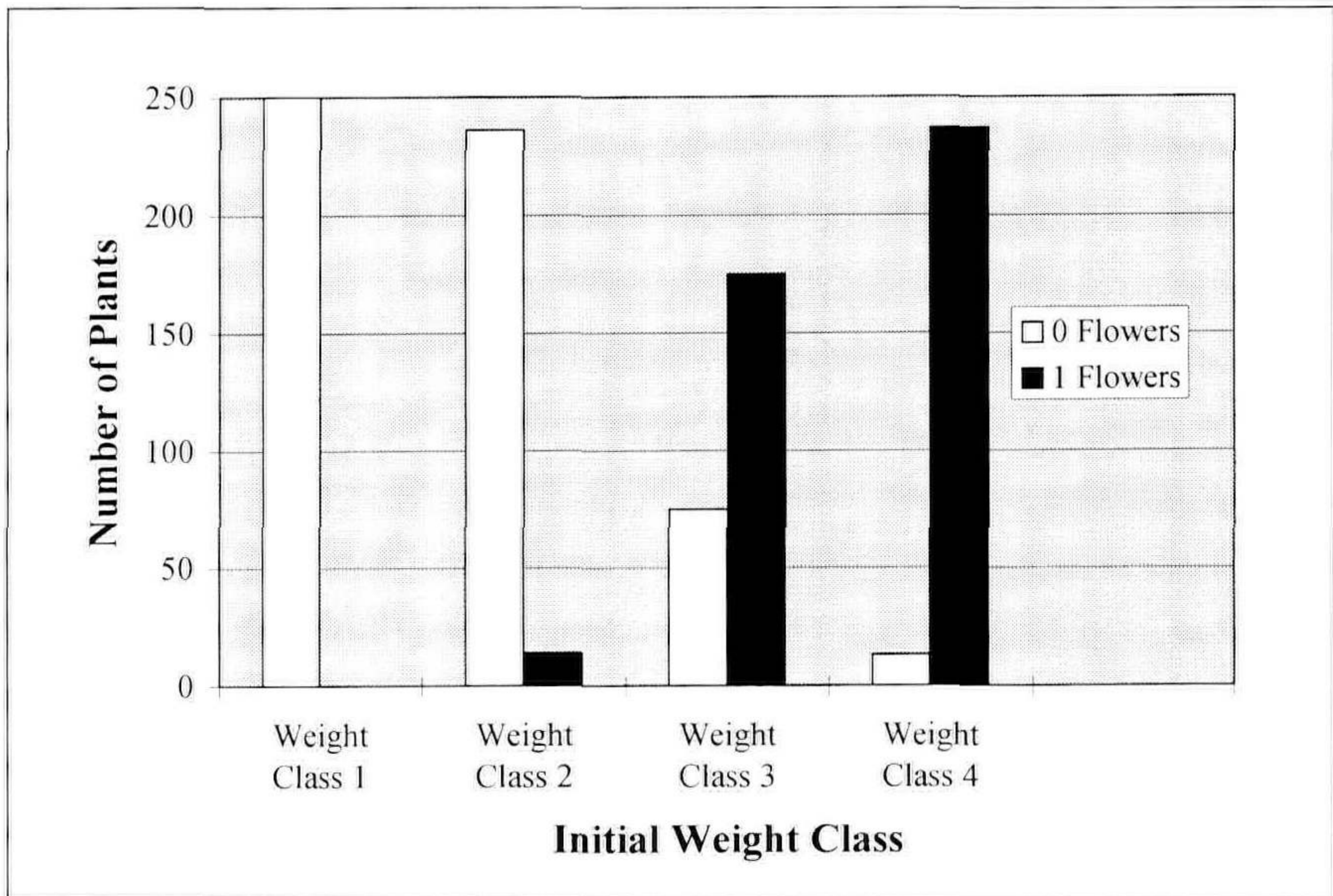
**Table 1.** Effect of fertilization on *Trillium* stem number, leaf number, and flower number.

Fertilizer class	Weight initial	Average number wt. (g)	Stem number	Leaf number	Flower
0	1	0.62 <sup>1</sup>	1.0	2.6	0.0
1	1	0.70	0.9	2.6	0.0
0	2	2.20	1.0	3.0	0.1
1	2	1.78	1.1	3.1	0.1
0	3	4.35	1.3	3.8	0.8
1	3	3.90	1.2	3.5	0.8
0	4	7.36	1.7	5.0	1.4
1	4	8.24	1.7	5.1	1.6

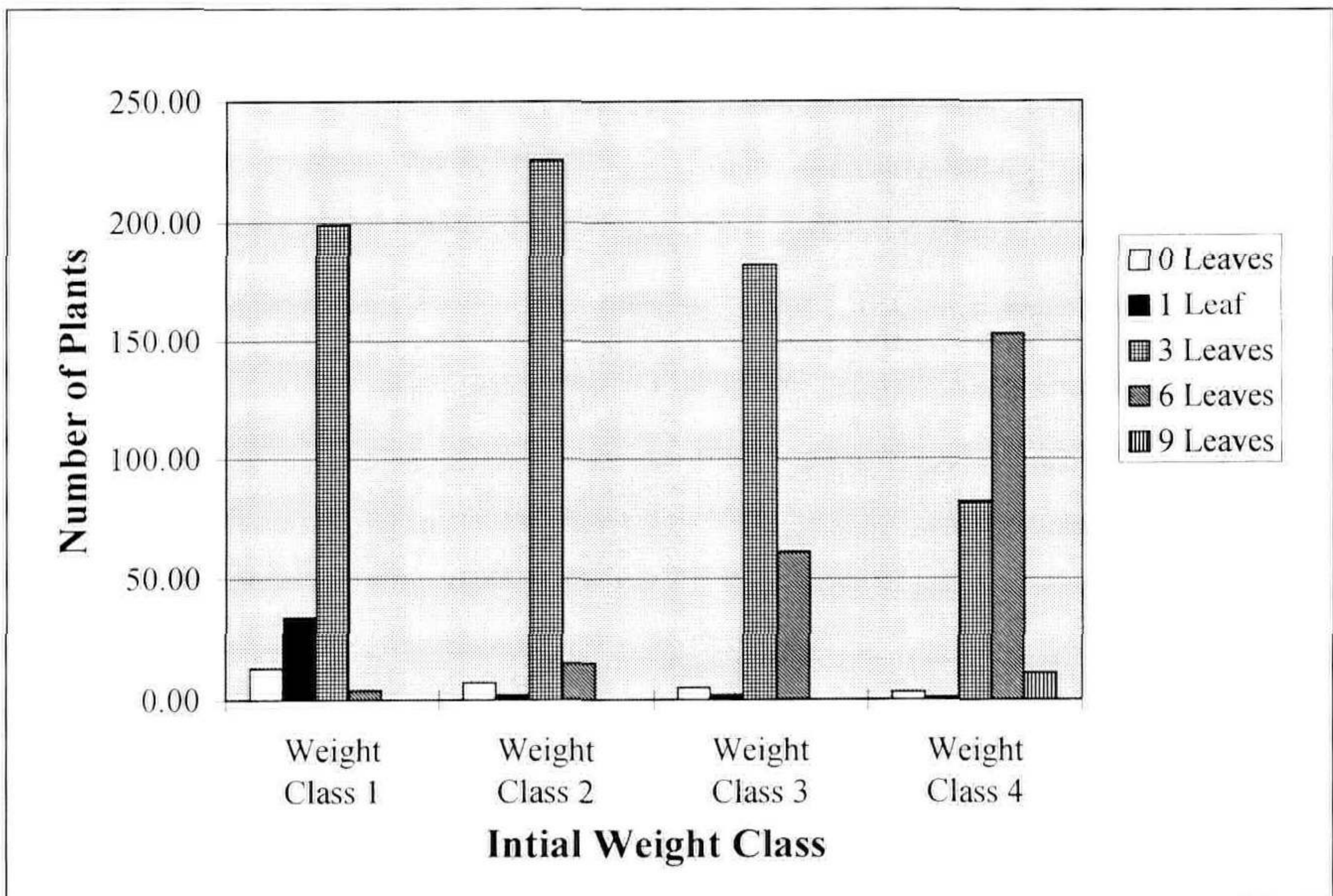
<sup>1</sup> Values represent the mean of 5 replicates of 25 plants each.

The application of fertilizer to tree bands for 1 year did not have a significant effect on stem number, leaf number, or flower number (Table 1).



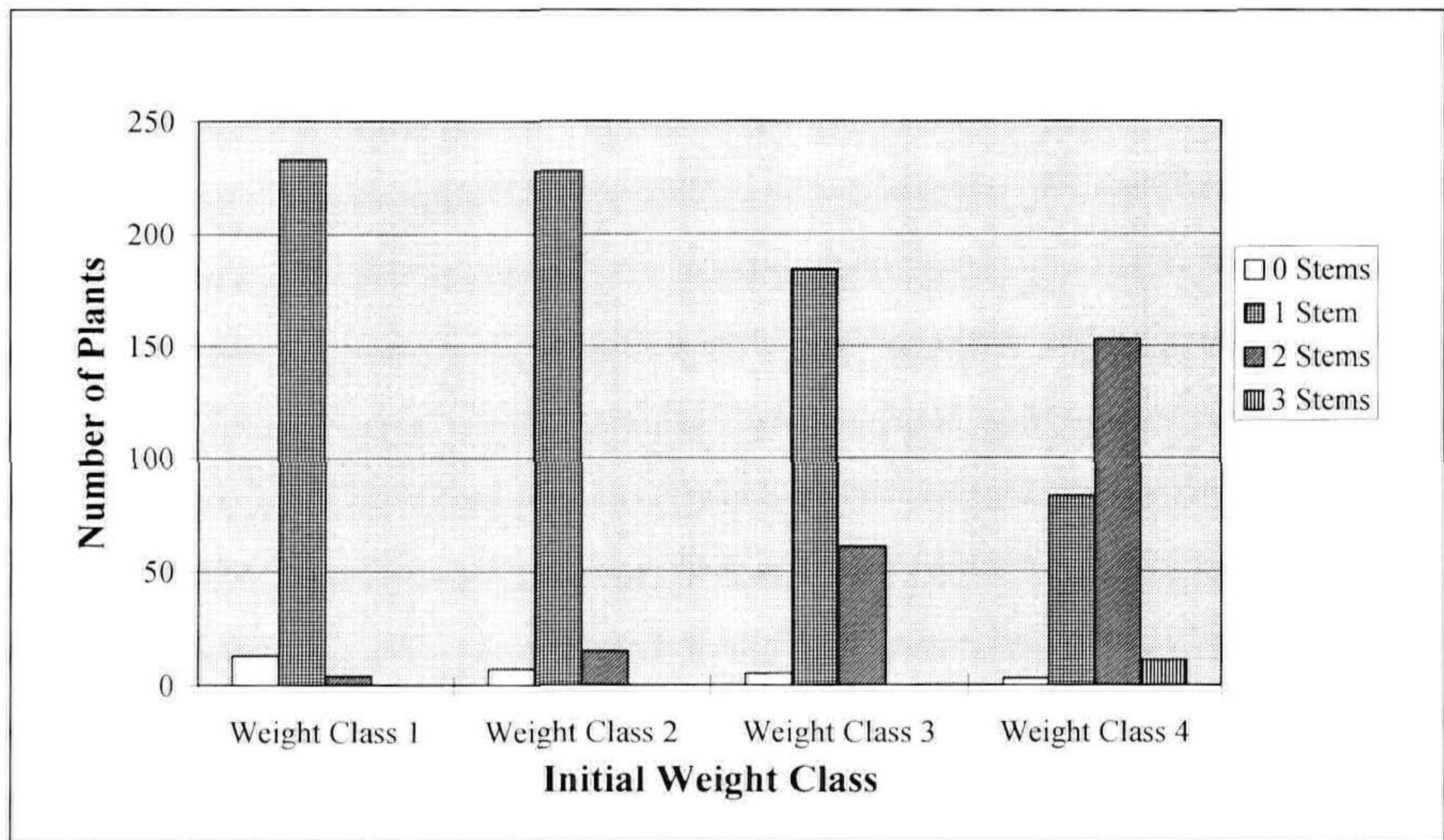


**Figure 1.** Number of plants producing flowers by rhizome weight class.



**Figure 2.** Number of plants producing multiple leaf production by rhizome weight class.





**Figure 3.** Frequency of multiple leaf stems by rhizome weight class.

## SUMMARY

- Seed germination occurred sporadically over 4 years with maximum germination (20%) occurring after 2 years in the seed bed.
- First flowering was initiated after 4 years in seed bed.
- Rhizome weight varied from 0.10 to 14.62 g after 4 years in the seed bed.
- Fertilizer application to potted rhizomes did not increase stem, leaf, or flower number in first year of study.
- Stem, leaf, and flower number were correlated with initial rhizome weight: 66% of rhizomes with initial weight over 5.31 g produced 2 or more stems; 94% of rhizomes with initial weight over 5.31 g produced 1, 2, or 3 flowers; 97% of rhizomes with initial weight over 1.26 g produced 3 or more leaves.