PAUL READ: This is a further response to Ralph's question. Cytokinins are a little tricky in that if you supply high cytokinin levels you may generate a bushier plant in the initial phases. That does not mean that you have modified the genetic make up of the plant. It does mean that you will have to find hormone levels that will give you a single stem plant if that is what you want.

RALPH SHUGERT: My question is, will you get a 'Capitata' type if you micropropagate from a lateral bud?

PAUL READ: I doubt that very much based on our current technology. If you look at something in the same category, *Araucaria*, you do not get good vertical growth from a lateral shoot. I have worked some on spruces and there is a similar concern.

JOHN EINSET: I think that we should remember that a micropropagated shoot is a small shoot and if you have problems with a cutting you will probably have trouble in a test tube.

EVALUATION OF A HOME TISSUE CULTURE MEDIUM

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Abstract. A comparison between variations of a proposed Home Tissue Culture Medium to the Murashige and Skoog basal medium is described. African violets, Boston ferns and variegated wandering Jew were able to be micropropagated on each medium. Although growth occured on all media, the Home Tissue Culture Medium supplemented with a vitamin tablet produced the best growth. Results with this medium were comparable to those obtained with Murashige and skoog's medium. The Home Tissue Culture Medium supplemented with coconut milk had the worst growth. By using the medium described, plant micropropagation can be performed at home using household items and simplified procedures.

REVIEW OF LITERATURE

Plant tissue culture is used by over 267 commercial nurseries and greenhouse growers in the United States for plant propagation (4). Although technical procedures for micropropagation are diverse, the popularity of this microtechnique is spreading to plant hobbyists (1). Bridgen and Veilleux (2,3) proposed simplified procedures and a culture medium for

[1] Undergraduate Student and Assistant Professor, respectively.

amateur gardeners to use; however, data on the success of using this medium has not been reported. The following study is a comparison of variations of the proposed medium to the Murashige and Skoog (5) nutrient medium.

MATERIALS AND METHODS

Four media were tested in this experiment. Treatments 1, 2 and 3 each contained the Home Tissue Culture Medium constituents (Table 1) as the basal medium. Treatment 1 included 4 tablespoons of unfiltered coconut milk; treatment 2 included a crushed vitamin tablet (One-A-Day plus Iron); treatment 3 had both coconut milk and a crushed vitamin tablet added; and treatment 4 contained the Murashige and Skoog (MS) (5) vitamins and macro- and microelements, 3% sucrose, and 6% Difco Bacto-agar. The pH values of all media were monitored but no adjustments were made in the Home Tissue Culture Medium. The pH of treatment 4 was adjusted to a value equal to that of the other treatments (pH 6.2 ± 0.1). All media were autoclaved at 15 psi and 121°C for 13 minutes.

Table 1. Home Tissue Culture Medium[1].

Basic medium constituent	Amount
Table sugar	⅛ cup (23 g)
All purpose soluble fertilizer	1 cup (240 ml)[2]
Tap water	1 cup (240 ml)
Inositol tablet (250 mg)	½ tablet (125 mg)
Agar flakes	2 tbsp
Optional constituents	**Amount**
Coconut milk	4 tbsp (60 ml)
Vitamin tablet	¼ tablet
Dolomite lime tablet	½ to 1 tablet[3]

[1] Modified Bridgen and Veilleux (1983) medium for a total of 1 pint of medium.
[2] Use 1 cup from the stock solution prepared by adding ¼ tsp fertilizer per gallon water.
[3] To be used in areas where water pH values are very low.

Boston fern (*Nephrolepsis exaltata* 'Bostoniensis'), variegated wandering Jew (*Tradescantia fluminensis* 'Variegata'), and African violet (*Saintpaulia ionantha* 'Tomie Lou') were propagated on each medium. Explants consisted of 3 cm rhizome tips from the fern, leaf/petiole cuttings from the African violet, and 3 cm shoot tips from the wandering Jew. African violet and fern explants were removed from aseptic cultures; wandering Jew explants were disinfested in 0.5% sodium hypochlorite for 15 min followed by a rinse in sterile distilled water. Explants were cultured in Bellco glass tubes (150 × 25 mm) and clear polypropylene "eggs" (10 × 15 mm). Cultures

were incubated at 27 ± 3°C under a photoperiod of 16 hr using cool white fluorescent lights (60-70μE $s^{-1}m^{-2}$).

Although a paper support had been suggested previously for the Home Tissue Culture Medium (3), common household thickeners such as corn starch, tapioca, gelatin, and agar flakes were tried as support materials.

Each treatment was replicated at least 8 times. The experiments were repeated twice and set up in a randomized complete block design.

RESULTS

The agar flakes solidified the media as well as commercial agar and remained solid during the course of the experiments. The corn starch, tapioca, and gelatin proved to be inadequate; these materials lost the ability to support plant material within 2 weeks after media preparation. The following results are from experiments performed with agar flakes used as the support material.

The African violet, wandering Jew, and fern explants all formed leaves and roots on all media (Figures 1,2,3,4 and Table 2). Treatments 2 and 4 had superior rooting and leaf production on all species. The fern on treatment 2 produced more leaves in the first 4 weeks than the other treatments (Figure 1). However, after 8 weeks, treatments 2 and 4 had comparable leaf production. The same pattern existed in fern root production (Figure 2). The number of leaves produced per African violet explant was greater for treatments 2 and 4 during the entire 8 weeks (Figure 3). The least amount of African violet leaf production was observed on treatment 1. Root production on all African violet explants was satisfactory, but superior on treatment 2 (Figure 4). After 5 weeks in culture, the wandering Jew formed no new axillary shoots on any medium; however, either one or two roots formed per explant on treatments 2, 3 and 4. Root and leaf initiation on wandering Jew explants was faster on treatments 2 and 4; no new roots or shoots formed on treatment 1 (Table 2). The only difference noticed in leaf and root initiation with African violets was on treatment 1; leaf production was considerably slower than the other treatments.

DISCUSSION

When modified, the Home Tissue Culture Medium (HTCM) proposed by Bridgen and Veilleux will allow plant micropropagation as well as the (MS) medium. Although each modification of the HTCM was satisfactory for plant growth, the medium which worked the best for these species included a crushed vitamin tablet and no coconut milk.

Table 2. Number of days for initiation of leaves and roots on African violet and wandering Jew explants.

Treatment	African violet		Wandering Jew	
	Leaves	Roots	Leaves	Roots
1	50	16	NA[1]	NA
2	21	13	19	7
3	23	16	22	12
4	27	15	19	4

[1] Not applicable - after 5 weeks, no new roots or shoots formed.

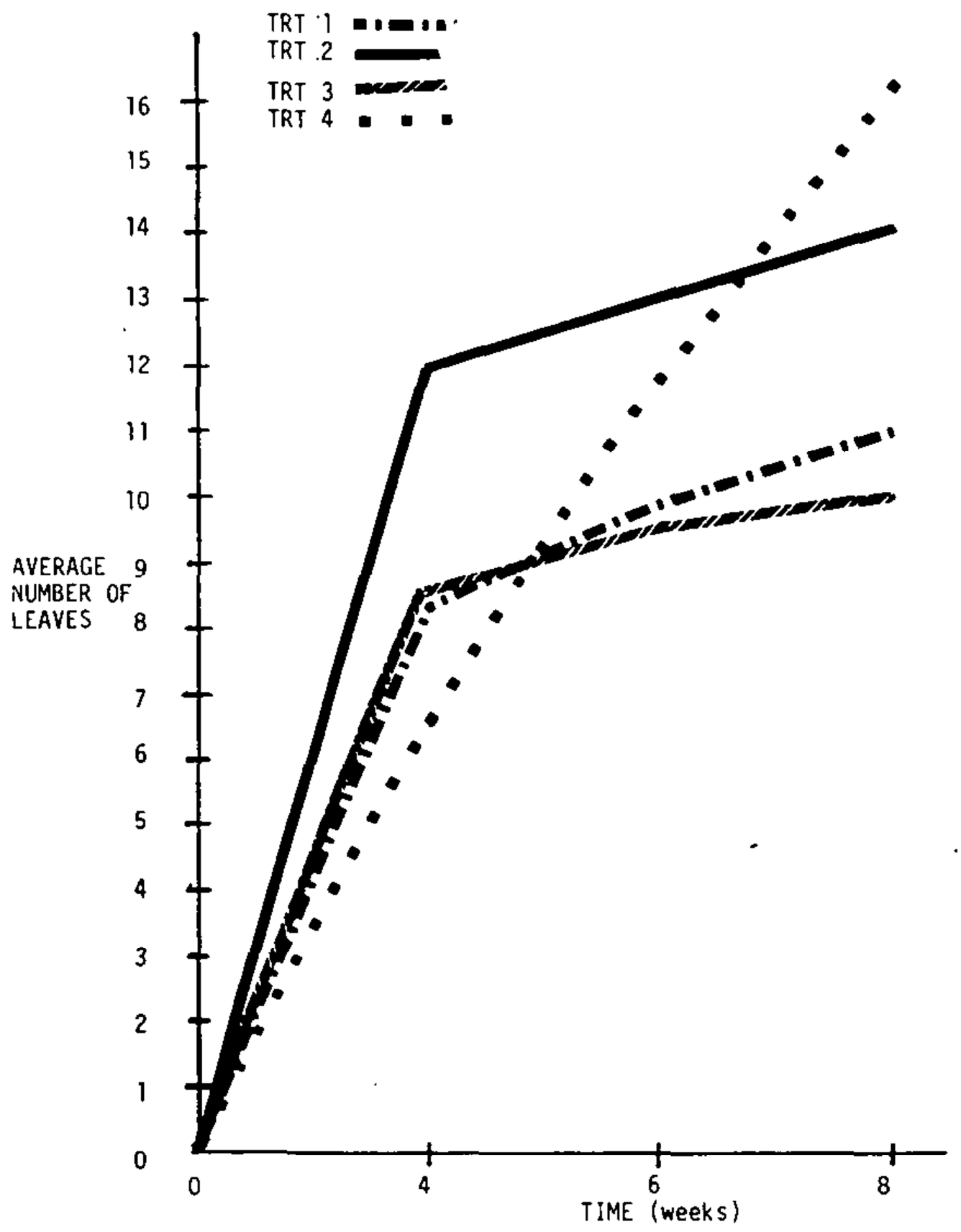

Figure 1. Average number of leaves produced per fern explant over an 8 week period.

Results of the HTCM may vary depending on the species propagated, the type of water-soluble fertilizer and vitamin, and the pH of water available. The pH of the tap water used for these experiments was not adjusted in order to simulate non-laboratory conditions. Distilled water could be used in areas with extreme pH values.

The kinds of water-soluble fertilizer and vitamin tablet used may also affect results. These experiments used Rapid-Gro fertilizer and One-A-Day Plus Iron vitamin tablets, but any other similar product could be used as long as the fertilizer is complete and the vitamins include thiamine. Coconut milk did not produce as favorable results as the medium without it. However, these results may vary for the species and propagule used.

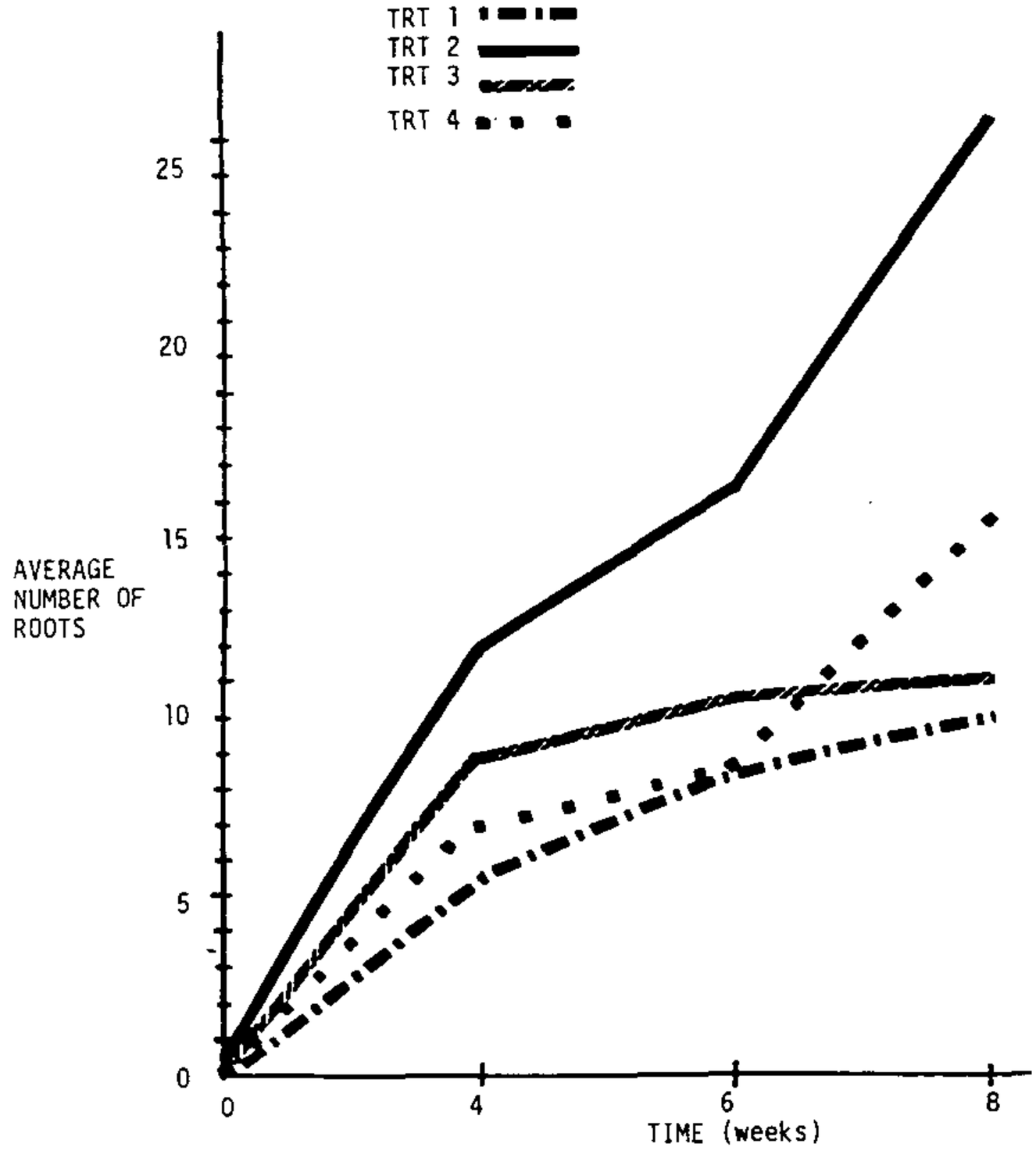

Figure 2. Average number of roots produced per fern explant over an 8 week period.

The data presented show that it is possible, using materials readily available to the amateur gardener, to micropropagate plants. The success of this medium will not only depend upon the preparation of the medium, but also the preciseness of the aseptic procedures. The hobbyist does not need laboratory conditions to perform microtechnique as long as procedures are followed quickly and aseptically (1,2). Although plant tissue culture will not become a major means of propagation for the hobbyist, it has the potential for becoming an intriguing project for plant enthusiasts.

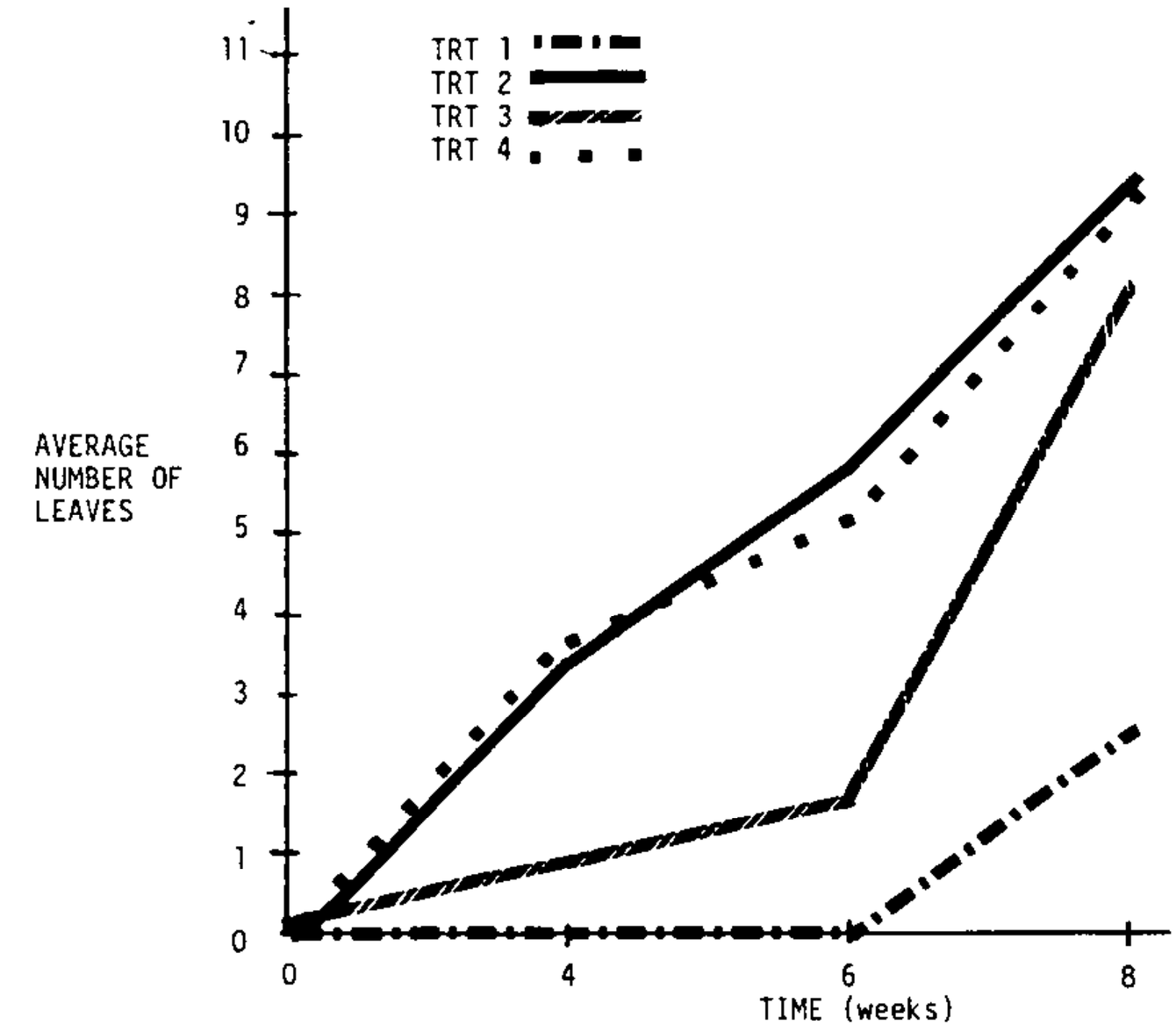

Figure 3. Average number of African violet leaves produced per explant over 8 week period.

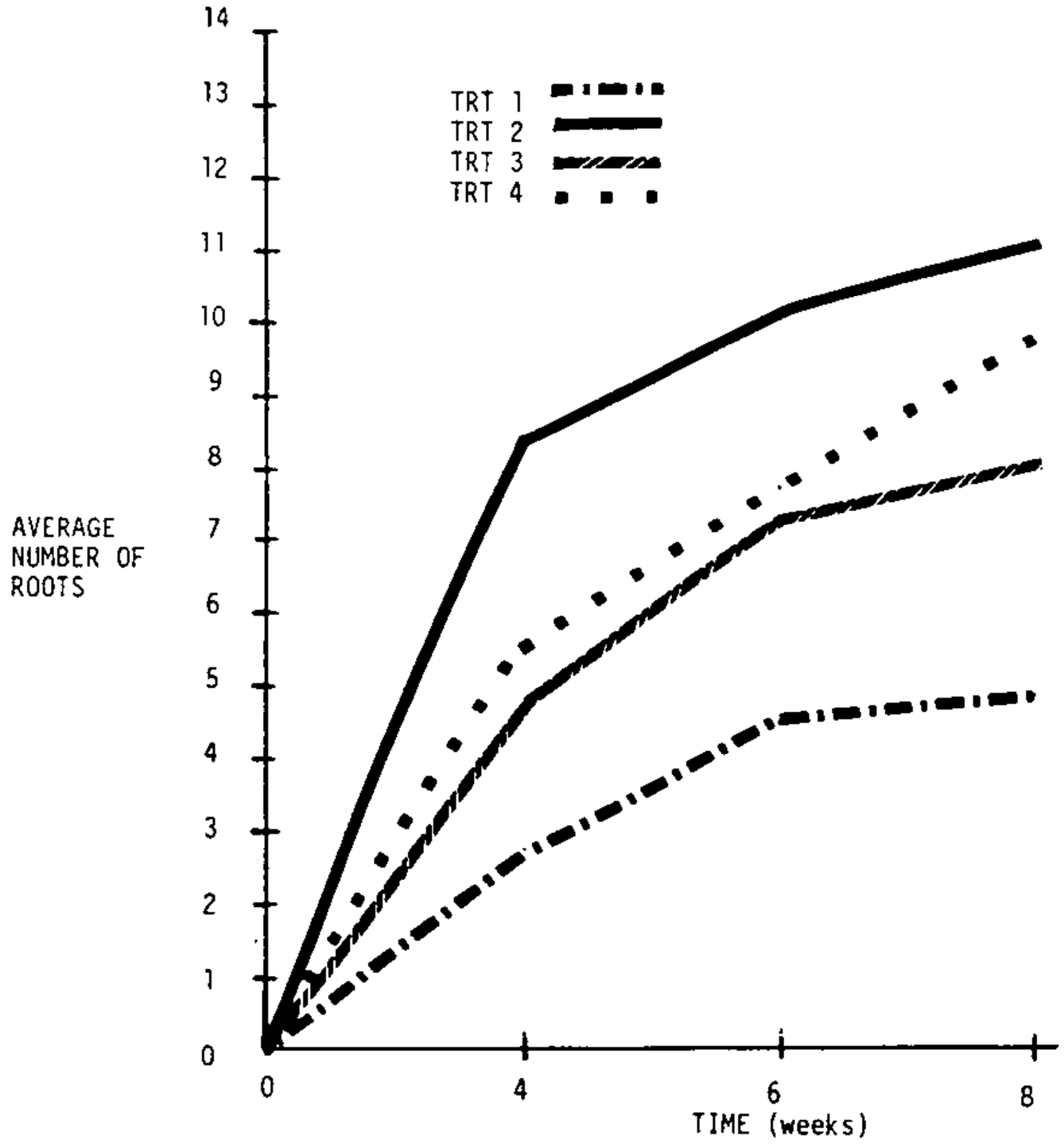

Figure 4. Average number of roots produced per African violet explant over an 8 week period.

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HYBRIDIZING, SELECTING, AND GROWING NEW FORMS OF *KALMIA LATIFOLIA*

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HISTORY AND BACKGROUND

Although grown by relatively few nurseries until recently, the native mountain laurel, *Kalmia latifolia*, has had a number of devotees over the years. It was one of the first broadleaf evergreens we grew at Weston Nurseries; we first listed it for sale in our 1935 catalog. Those early plants were collected from the wild and grown in our fields to regenerate roots. It wasn't long before we noticed a significant amount of variation in flower color and began to see potential for interesting color in late spring landscapes.

In 1937 we bought some plants from Ernest Borowski, a nurseryman from Norwood, Massachusetts, who grew pink-flowered seedlings. These plants were originally grown and perhaps hybridized by Charles O. Dexter in his quest for more colorful flowers. Dexter was the first person we know who worked on improving mountain laurel. We soon found that our customers enjoyed having more colors from which to choose and by about 1945 we were beginning to raise seedlings of our own.

Things do not happen quickly in the nursery industry. Even though we had sold colored forms for some years it was not until 1959 that we grew enough to list in our catalog. At that time we charged a 50% premium for pinks selected from our growing fields. Since then we have refined our selection process and growing techniques. By the 1970's we were separating colored forms into three major groups: pink, red-bud-