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MODERATOR KESTER: Thank you, Hudson. I will now present some results we have obtained in rooting hardwood cuttings of peach/almond hybrid clones.

ROOT INITIATION IN HARDWOOD CUTTINGS OF PEACH-ALMOND HYBRID CLONES

DALE E. KESTER
University of California
Davis, California

This report summarizes results of experiments carried out during the fall and winter, 1968-69, as part of a program to select clonal rootstocks for stone fruits (*Prunus*), with emphasis on peach x almond, F_1 hybrids. Earlier, we found that cuttings of almond clones were impossible to root; peach was relatively easy-to-root and hybrids of peach and almond (P-A) were intermediate, with a range among clones from easy to difficult (3, 4). Hansen (1) has selected P-A clones that are nematode resistant and Hansen and Hartmann (2) reported good survival of hardwood cuttings of P-A clones if taken in the fall or early winter, treated with IBA and Captan, then planted directly into the nursery.

The purpose of the experiments reported here was to evaluate rooting of different *Prunus* clones. To do this we wanted to develop a screening procedure whereby we could accurately and easily evaluate the genetic ability of individual

clones to initiate roots. We also wanted to distinguish "rooting ability" from "survival ability" in the nursery although we recognized that the two characteristics were closely related.

PROCEDURE

The basic procedure was to make cuttings of 3 lots of 25 each, treat them with IBA and Captan, and either store in damp peat moss for weekly examination of root initiation, shoot development, and callusing — or plant cuttings directly in the nursery. Three clones were tested at various temperatures and treatments, with one group in storage and a comparable group planted directly in the nursery. Fifty-two other clones were evaluated in storage only at 68°F.

RESULTS

Data on root initiation and cutting survival of the three clones is given in Table 1. Contrary to what was expected, the best rooting in all cases was obtained with cuttings planted directly in the nursery. The values obtained can be taken as the upper limit for rooting under the conditions used. Factors involved in determining rooting in particular cases were (1) *clone*, (2), *time of collection*; (3), *method of handling*; and (4), temperature. Being able to judge the best rooting clone therefore required the evaluation of the effect of a number of factors on both root initiation and survival.

Table 1. Percent rooting (storage) and percent survival (nursery) of hardwood cuttings of peach x almond (P-A) clones.

Clone	Treatment	Collected November 22, 1968		Collected January 16, 1969	
		Storage	Nursery	Storage	Nursery
'P-A 2-16-8'	Direct planting	—	60	—	69
	50°F storage	30	—	32	—
	59°F storage	60	—	40	—
	68°F 4 days[1]	46	69	9	31
	68°F 10 days[1]	60	64	24	42
	68°F continuous	22	—	45	—
'P-A 3-8-9'	Direct planting	—	77	—	50
	50°F storage	38	—	15	—
	59°F storage	70	—	25	—
	68°F 4 days[1]	46	74	15	57
	68°F 10 days[1]	50	57	55	54
	68°F continuous	5	—	18	—
'P-A 2-16-5'	Direct planting	—	62	—	17
	50°F storage	17	—	0	—
	59°F storage	23	—	12	—
	68°F 4 days[1]	14	45	3	16
	68°F 10 days[1]	8	46	0	17
	68°F continuous	0	—	6	—

[1]Followed by 50°F storage or direct planting.

(1). The easiest-rooted clone appeared to be 'P-A 2-16-8'. Rooting was best at 59°F storage at the December collection and equalled direct planting. Storage at 50°F gave poorer rooting in both collections. Exposure to 68°F decreased rooting; the limiting factor at this temperature with this clone was greater decay at these warmer temperatures.

Cuttings taken in January rooted as well as November collections if directly planted, but all storage treatments resulted in poorer rooting.

Cuttings taken in November required 50-60 days to develop roots in storage (Fig. 1), depending on temperature. During this long period, decay developed at the higher temperatures, thus decreasing rooting. The buds were evidently in a rest period since few shoots grew. In contrast, roots developed rapidly and completely (once started) on 'Marianna 2624' plum taken at the same period without any decay appearing.

Cuttings taken in January (Fig. 2) were not in the rest since shoots grew readily. Roots developed in 20-30 days but decay occurred and survival was reduced.

(2). 'P-A 3-8-9' had a better rooting capacity in general

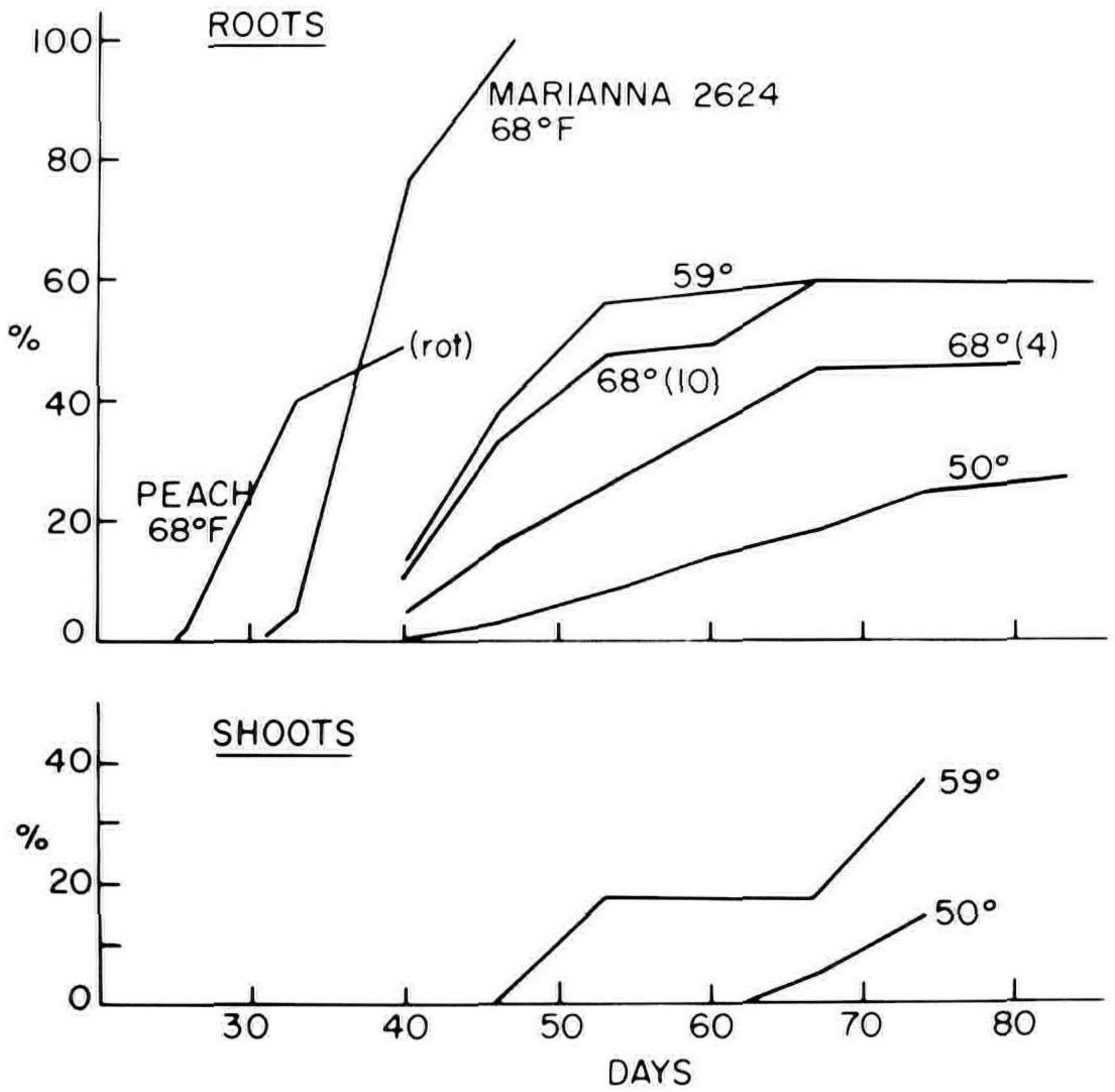

Fig. 1. Root and shoot development on hardwood cuttings of 'P-A 2-16-8', peach, and 'Marianna 2624', in storage at different temperatures. Cuttings collected November 22, 1968. Numbers in parentheses refer to days at 68°F, after which the cuttings were shifted to 50°F.

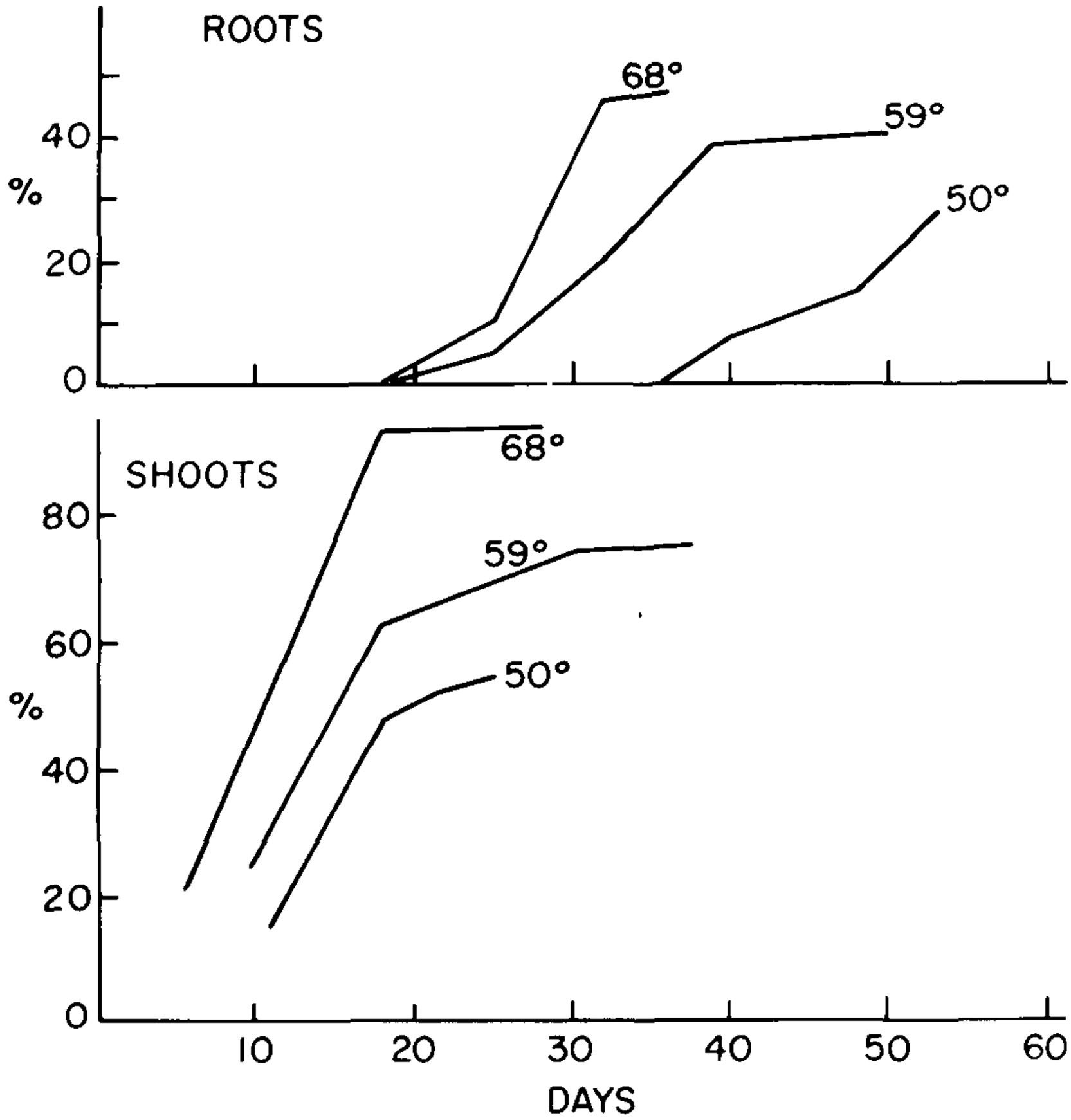

Fig. 2. Root and shoot development on hardwood cuttings of 'P-A 2-16-8' held in storage at different temperatures. Cuttings collected January 16, 1969.

(at least with the November collection), but survival tended to be low in many of the treatments. Temperature responses were the same as for 'P-A 2-16-8'. The January collection resulted in lower survival possibly because of more susceptibility to rot at that stage.

(3.) 'P-A 2-16-5' was the poorest rooting clone but it was uncertain whether this was due to inadequate rooting or poor survival. Storage was damaging but difficulties were overcome by direct planting. Collecting these cuttings in January decreased rooting markedly.

CONCLUSIONS

Evaluating clones for rooting ability is not easy because one must consider their response to various factors. It appears that P-A clones would produce consistently good results if directly planted in the nursery under conditions used here. However, storage of the cuttings at 59°F might be a better test of rooting potential since it could bring out possible differences in survival ability that would not be apparent by direct planting.

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MODERATOR KESTER: Our next speaker is going to talk about rooting hardwood cuttings of a specific plant, the red smoke tree. He is Lee Rosenkranz of Doty and Doerner, Portland, Oregon. Lee:

EXPERIMENTS IN ROOTING HARDWOOD CUTTINGS OF RHUS COTINUS 'ROYAL PURPLE' — RED SMOKE TREE

LEE ROSENKRANZ
Doty & Doerner, Inc.
Portland, Oregon

Initial work on rooting cuttings of *Rhus cotinus* 'Royal Purple', (red smoke tree), was started in the summer of 1965 with an attempt at rooting softwood cuttings taken at several intervals. This resulted in a complete failure, and a decision was made to look into the prospects of hardwood cuttings.

In the past all smoke trees had been propagated by grafting, but a shortage of understocks, and the tendency toward weak graft unions, prompted a consideration of rooting of cuttings.

In January, 1966, the first cuttings were stuck in pure sand in a heated greenhouse with a bench temperature of 70° to 72°F. One hundred cuttings were put in a regular cutting bench, and another 100 were placed under intermittent mist. All were terminal cuttings. Most cuttings leafed out, but those in the regular bench failed even to callus. Those under the mist lasted longer, and a few rooted, but the roots decayed before they were ready to dig.

In December, 1966, a cutting bed was built in an unheated poly house which used the heated greenhouse for its south wall. The bed was on the ground against the north wall of the greenhouse, and was equipped with bottom heat. The cable was under five inches of fine sand. Depending on the outside temperature, the bed remained between 60° and 72°F. Terminal cuttings were made 8 inches long, and half of them were wounded. The cuttings were treated with Hormodin #1 or #3, or Jiffy Grow, diluted 1 to 10 with water; an untreated check was included. A few sub-terminal cuttings were used to fill out the counts. Four batches of cuttings were stuck at two-week