

observed with the 96 hr aeration presoaking treatment. Total germination percentage at 10 weeks was 80% for 96 hr aeration presoak, 20% for control, 53% for depulping, and 60% for 96 hr no aeration treatments. The effect of high medium temperature was consistent with the other experiments. A 31°C medium temperature severely inhibited seed germination.

In summary, depulping greatly improved maile seed germination. Presoaking the depulped seeds in water with and without aeration produced similar germination trends to the depulping treatments. However, presoaking with aeration for 96 hr produced the highest seed germination with the unheated medium (18° to 27°C). Bottom heat is not necessary and 31°C medium temperature drastically reduced germination.

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COMPARISON OF ROOTING MATERIALS ON LEUCOSPERMUM CUTTINGS

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The development of proteas as an export cut flower crop for Hawaii is relatively recent. As a result of a research project in the University of Hawaii's Department of Horticulture, the first commercial protea farm was planted on a 6-acre tract of land adjacent to the Experiment Station in Kula, Maui in the fall of 1972. The second farm was planted in 1975, encompassing approximately 12 acres. Today, there are over 110 acres of proteas planted in Hawaii on the cool slopes of volcanoes on Maui and the Island of Hawaii.

At first, plants from seed were considered to be the appropriate material to use. As the protea industry expands on an

international level, it has become increasingly evident that farms planted with vegetatively propagated selections of cultivars with superior colors, shipping qualities, and resistance to disease will have significant competitive advantage over farms with seedlings of variable quality.

In anticipation of the release of 3 clones of the sunburst protea, (*Leucospermum*) to the industry in the fall of 1982, a project to compare three commercial rooting materials was conducted at the Maui Agricultural Research Center in Kula. Two *Leucospermum* hybrids from South Africa were used: 'Firefly' (*L. tottum* × *L. cordifolium*), and 'Veldfire' (*L. conocarpodendron* × *L. glabrum*).

The three commercial rooting materials were two liquid formulations and one powder. The two liquids contained both IBA and NAA while the powder contained IBA only. Table 1 presents the concentration of auxins listed on the labels of the three materials used and Table 2 lists the various treatments.

Table 1. Auxin composition of the three materials tested.

Material	Composition	
	IBA	NAA
Dip 'n Grow (liquid)	1.0%	0.5%
Hormex #8 (powder)	0.8%	—
Wood's Rooting Compound (liquid)	1.03%	0.51%

Table 2. Treatments used in rooting *Leucospermum* cuttings.

Treatment No.	Material	Dilution
1	Dip 'n Grow	1:5
2	Dip 'n Grow	1:10
3	Dip 'n Grow	1:20
4	Wood's Rooting Compound	1:5
5	Wood's Rooting Compound	1:10
6	Wood's Rooting Compound	1:20
7	Hormex #8	Talc dip
8	Control	—

The basal portion of 4 in. terminal cuttings of recently matured wood were dipped for 5 seconds in the compound appropriate for each treatment. The cuttings were stuck in alternate squares of the Speedling tray with 0.4 cm. openings. A rooting medium of 50% coarse peat moss and 50% #2 grade perlite was used. Bottom heat at 21°C was maintained on the propagating benches and mist of 2.5 seconds duration was on every 5 minutes during daylight hours.

Cuttings were stuck June 15, 1982; 45 days later, August 1, cuttings with roots showing through the bottom opening in each square were potted. The project was concluded Septem-

ber 1, 75 days after sticking, when all remaining rooted cuttings were potted up.

Table 3 gives the results of the various treatments on rooting of the two *Leucospermum* cultivars.

Table 3. Effect of three materials on rooting of *Leucospermum* 'Firefly' and *L.* 'Veldfire' cuttings.¹

Cultivar	Treatment No.	Percent of Cuttings Rooted and Potted		
		45 Days	75 Days	Total
'Firefly'	1	18	52	70
	2	53	41	94
	3	55	29	84
	4	53	23	76
	5	54	27	81
	6	42	28	70
	7	12	48	60
	8	16	30	46
'Veldfire'	1	44	50	94
	2	50	40	90
	3	30	30	60
	4	50	44	94
	5	30	40	70
	6	40	15	55
	7	56	19	75
	8	3	19	22

¹ 64 cuttings per treatment — 'Firefly'
20 cuttings per treatment — 'Veldfire'

The use of a commercial rooting material resulted in an increase in rooting percentage as compared to the untreated control, (Treatment No. 8).

After 45 days, better than 50% of the 'Firefly' cuttings had rooted with no appreciable difference between Dip 'n Grow at 1:10, 1:20 and Wood's Rooting Compound at 1:5 and 1:10. With 'Veldfire', 50% of the cuttings had rooted in the Dip 'n Grow 1:10 and Wood's 1:5 treatments; 56% of the cuttings had rooted in the Hormex #8 treatment after 45 days.

For total percent rooting after 75 days, for 'Firefly', the three best treatments were: Dip 'n Grow at 1:10 (95%), Dip 'n Grow at 1:20 (84%) and Wood's Rooting Compound at 1:10 (81%). For 'Veldfire', 94% rooting was achieved with either Dip 'n Grow or Wood's at 1:5. Dip 'n Grow at 1:10 produced 90% rooting.