

PROJECT: PROTEAS — HAWAII

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In 1965, seed of various South African *Proteaceae* were planted at the Maui Agricultural Research Center as part of a miscellaneous "New Crop Evaluation" project of the Hawaii Agricultural Experiment Station, University of Hawaii. In 1970, 63 species of 9 genera, plus 14 selected clones of 8 species obtained from Hawaii, California and New Zealand were planted to evaluate possible commercial use of proteaceous plants as cut flowers, cut foliages, and for landscape use.

Test shipments of cut flowers and foliages were initiated when it was determined that one species, *Leucospermum cordifolium*, bloomed earlier in Hawaii than on the mainland. The enthusiastic reception these flowers received, and the prices paid in the test markets of Texas, Michigan, Pennsylvania and New York was responsible for the creation and approval of a new research project dealing exclusively with ornamental species of the family *Proteaceae*.

The new project, "Protea Selection, Management and Marketing," now serves as the operational plan of attack to develop the information necessary to establish proteas as a new export crop for Hawaii.

A paper was published in the August, 1973, issue of *HortScience*(1), which is a detailed report of the work in progress on proteas, and reprints are available.

CURRENT RESEARCH

Propagation. 1. *Seed.* After using various mixes for seed propagation, the current recommendation in Hawaii is for 75% fine screened cinders and 25% coarse peat moss. Cinders are shaken through a 1/4 inch mesh and caught on a window screen to remove the dust and fine pumice. Bottom heat (70°F), and plenty of moisture, leaching through 6" of media, in seed bed in an airy location yields good results on Maui.

2. *Cuttings.* The same media (3/4 cinders — 1/4 peat moss) is used for rooting cuttings at this time. Work in South Africa indicates a species response to various media. *Leucospermum* are reported to root faster in pure peat moss, while *Protea* root better in peat-perlite combinations. We have been unable to duplicate the

results under Hawaiian conditions. Dr. Criley is currently engaged in studying the rooting response of *P. neriifolia* to various growth factors, while *L. cordifolium* responds best under our conditions to IBA at concentrations of 0.2 to 0.3% (2000 to 3000 ppm). Dr. Ito is conducting some controlled crosses with various species of *Leucospermum* at the Maui Station.

Management. Proteas have been planted at Experiment Stations on the islands of Kauai, Oahu, Maui and Hawaii to determine their range of adaptability. Dr. Sanford has designed two nutrition projects; Dr. Nishimoto has both short-term and long-range herbicide trials underway; Dr. Wu is setting up irrigation requirement studies; Drs. Holtzman and Cho are working in the area of disease control.

Production. Emphasis is placed on *Leucospermum cordifolium* 'Hawaiian Sunburst,' because of its blooming season. In 1972, on 6-year-old plants, 65% of the total crop was harvested during the high priced mid-winter period of December through February. Average production per plant was 600 flowers cut in a six-months period, December-May. In 1973, 60% of the crop was cut from December through February, (650 flowers per plant, average), and in 1974, 75% of the crop bloomed in the same period, with an average production for the season of 600 flowers per plant.

Although a few saleable flowers can be anticipated in 26 to 28 months, it is generally accepted that the first crop will be the third year, 36 to 40 months from sowing seed. Under favorable conditions, this crop can be expected to yield 100 to 120 flowers per plant over a three-months period.

Since a majority of 'Hawaiian Sunburst' being planted are from rooted cuttings, a study is under way comparing the production of seedling plants with vegetatively propagated plants. During the spring of 1974, when the plants were 29 to 33 months old (seed were sown and cuttings were stuck in July, 1971), the seedlings averaged 20 flowers per plant (varying from 1 to 27 flowers), while the rooted cuttings averaged 16 flowers (varying from 1 to 79 flowers). The first "commercial crop" — after the third year — will produce some interesting information.

Test Market Studies — Japan. To gather data on marketing costs in Japan, arrangements were made through the Hawaii International Services Agency to ship proteas to Tokyo on a small lot basis. No advance educational or promotional activities to introduce proteas were scheduled, and the flowers were unknown. They were placed at auction at the flower market, and the 'Hawaiian Sunburst' brought 29 to 45 cents each while all other larger-flowered proteas and banksias sold for \$1.01 to \$1.35.

Import expenses emphasized the need for a commodity rate. Air freight ranged from \$1.85/lb. (under 100 lbs.) to \$1.01/lb. for

640 lbs. (16 cases). Import duty was 20%. Customs clearance inspection varied from \$32/case (1 case) to \$7/case (over 10 cases). Fumigation charges ran from \$27 for a single case to \$9/case in lots of 10 or more. Local trucking in Tokyo ran from \$1.55 for a single case to \$0.51/case for 10 or more. At the present time, then, only large-lot shipments of higher priced flowers seems feasible.

COMMERCIAL PRODUCTION

As a result of this project, there are currently 10 acres of proteas planted on Maui, with another 20 acres projected as plants become available. On the island of Hawaii, approximately 3 acres are planted with plants for another 6 acres on order.

Establishment of an efficient cooperative marketing organization has top priority for the coming year as data is analyzed from the Experiment Station's test shipments. It is hoped that in the years ahead, the flower markets of the world will be increasingly aware of Hawaii's newest export of exotic blossoms.

LITERATURE CITED

1. Parvin, P.E., R.A. Criley, and R.M. Bullock. 1973. Proteas: developmental research for a new cut flower crop. *HortScience* 8(4):299-302.

MODERATOR LESLIE CLAY: Thank you, Phil. Our next speaker this morning is Bill Teague, also speaking on *Protea*. He is a graduate of Cal Poly in 1967 in Ornamental Horticulture. He has approximately 20 acres under cultivation at Vista, California, and is basically a wholesale grower. You can thank Bill and his wife for this beautiful display of *Proteas* on the podium and tables at the front here this morning. So Bill, would you take over please?