

## TRAINING PLANT PROPAGATORS AND NURSERY WORKERS

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During the 1950's an extensive study of higher education in California was made, resulting in passage of the Donahoe Act which delineated responsibilities. The University of California, with 9 campuses, has the responsibility for research, extension, and teaching to the Ph.D. level; the California State University, with 19 campuses, has teaching responsibility at the bachelor's and master's level; and the 104 community colleges in California provide a two-year education geared primarily to local community needs.

Cal Poly is one of the four state universities with an agriculture program. Our teaching program has a practical orientation with lots of "hands on" experience and our graduates go mainly into agricultural production or supporting industries. We claim that we are preparing them for middle-management positions but we also are giving them the skills and experiences that will enable them to climb to the top.

Our long-time president, Julian A. McPhee, took charge of Cal Poly during the depression years in the 1930's. Having been a high school agriculture teacher, he was concerned that, in the traditional college, students would take two years of general education before declaring a major. If they discovered in the third year that they were in the wrong major, several years of course work could be lost. And so he introduced what he called the upside-down system in which students began their major classes from the first day. If for some reason the student had to leave school at the end of one or two years, at least he had some marketable skills. If the student found that he was in the wrong major he could change to another at an early stage. The upside-down system was criticized and condemned by many educators, but over the years it was copied by many colleges and universities.

In talking with employers, President McPhee heard the criticism that, in general, college graduates had a weakness in writing reports. This led to the requirement when Cal Poly was authorized to award the B.S. degree in 1941 that every student would write a thesis before graduating. We are probably the only university in the United States that requires a thesis for a bachelor's degree. The students complain about the

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requirement and frequently put it off until the last hour. However, when I visit graduates on the job they often comment that it was a most valuable experience.

In California we try to establish an interest in horticulture at an early age. We have a strong vocational agriculture program in many of our high schools, partially funded by the Federal Government. In 1963 the U.S. Congress passed a Vocational Education Act that provided federal funds to expand existing high school programs in agriculture; the typical program was heavily animal-oriented but was in an area that became urbanized. As a result, land was limited and, since the livestock industry had moved away, jobs were likewise limited. Many of the agriculture teachers could see ornamental horticulture as a means of continuing a strong agriculture program, meeting community needs and training students for immediate employment. The teachers as a group asked for help in expanding into horticulture. Our faculty travelled all over the state working with the schools on curriculum, facilities, and teaching skills. Each summer we offer workshops for over 100 teachers involving horticultural skills.

As greenhouses and other facilities blossomed on the high school campuses, Ornamental Horticulture became part of the judging program for the Future Farmers of America. This brought a respectability to the field that had not existed previously — and when girls were admitted into the FFA program in the 1970's it doubled the potential enrollment.

Our program in Ornamental Horticulture is very closely allied with the nursery, floriculture, and landscape industries of California. For the past 37 years the California Association of Nurserymen has held its annual Refresher Course on our campus. Our students are greatly involved in its operation, offering them an opportunity to meet and talk with potential employers. Our program in Floral Design was established at the request of the California State Florist's Association over 25 years ago when they realized that no young people were going into their business. With this as background let us take a look at our teaching program in Ornamental Horticulture. How would a young person acquire the skills and knowledge that would prepare him for a career as a propagator or nurseryman?

Our courses are set up on a quarter system of four 11-week quarters per year. The traditional student would start in the autumn quarter and continue through the spring with summer off to work or travel.

The first quarter the student would take at least two major courses:



- (1) Orientation, which looks at the field of horticulture, career opportunities, how to use the library, and how to write reports, including an autobiography for his departmental file.
- (2) Nursery Practices, where soil mixing, sanitation practices, seed propagation, transplanting, potting, canning, and greenhouse operations are studied.

Hopefully the student would live on campus the first year and be an active member of the O.H. Club. The student would be encouraged to take a part-time job at the Ornamental Horticulture Department or at a local wholesale nursery and should work closely with the advisor on scheduling classes and balancing the school work with co-curricular activities.

During the second year this student would take the Plant Propagation class to learn about cuttings, rooting aids, budding, layering, and tissue culture and would be encouraged to become involved in the Agricultural Enterprise Program in which a crop would be researched. Then, financed by the Cal Poly Foundation, the student would produce and market the crop, receiving  $\frac{2}{3}$  of the net profits for his efforts. The student would be encouraged to apply for the summer training program at Monrovia or Hines Nursery.

During the third year this student would take the Advanced Plant Propagation course which emphasizes grafting, dormancy in seeds, and winter propagation. By then the student would have completed chemistry, entomology, plant pathology, and a host of horticulture courses. At this stage students are encouraged to apply for an internship in the propagation or nursery production field and they might also take a special problems course, dealing with some phase of propagation.

In the final year our student will sign up for a senior project (thesis) course. The subject, approved by the advisor, will be researched in the library. Treatment plots will be established and, hopefully, results will be obtained for early spring write-up. In the senior Seminar class public speaking skills can be polished, and an employment resume is prepared, as well as exploring the latest developments in the major field. Having established career goals the student will interview both on and off campus.

If the scenario follows through the student will graduate in June of the fourth year with the proud parents at the ceremonies, then proceed to a job as a plant propagator or nursery employee.

Cal Poly has the largest enrollment in Ornamental Horticulture of any university in the United States. We traditionally

graduate 150 to 200 students a year and most of them go into the ornamental horticulture industries of California.

While we claim to be educating students for middle management positions, it is rewarding to see them climb the ladder of success. Many of them become owners or managers of businesses. They are active in their trade associations as is evidenced by the number of our graduates who have been presidents of the California Association of Nurserymen. We also have an active alumni association. A new graduate taking a job in the industry can be sure that there are O.H. graduates in the area to give him a helping hand. Support for our program is evidenced by the fact that our students receive \$35,000 to \$40,000 a year in scholarships.

A number of alumni have remarked to me that it was interest in plant propagation that took them the college route but it was the support courses such as accounting, business law, labor relations, computer science, and public speaking that enabled them to advance in the business world.

## SEED GERMINATION STUDIES WITH KENTIA PALMS (*HOWEA FORSTERANA*)

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**Abstract.** Seed of the kentia palm (*Howea forsterana*) was subjected to presowing treatments before planting in peat:perlite (50:50) at incubation temperatures in the range 20 to 40°C. Four percent of freshly harvested seed was found to be non-viable. Air drying the seed at 20 to 25°C for two weeks prior to sowing hastened decomposition of the outer husk. After 12 months there was nil germination of dried seed incubated at 20°C compared with 1.3, 5.4, 7.9, and 11.0 percent at temperatures of 25°, 30°, 35°, and 40°C, respectively. None of the undried seed had germinated after 12 months irrespective of substrate temperature. Chipping of part of the outer husk resulted in 6% germination compared with nil for unchipped seed, while soaking chipped seed in gibberellic acid (250 to 1000 mg L<sup>-1</sup>) further improved germination. Gibberellic acid at greater than 250 mg L<sup>-1</sup> produced no increase in germination and, at 750 mg L<sup>-1</sup> germination was inexplicably decreased. A relationship between substrate temperature and seed decay appeared to exist for dried seed with maximum decay (ca.20%) occurring at 35°C. Fungi have been isolated from decayed seed and their pathogenicity and control are currently being investigated. Seed stored at 5°C for periods of up to 24 weeks had not germinated after 12 months.

## REVIEW OF LITERATURE

The kentia palm, *Howea forsterana* (previously *H. forsteriana*), is one of the most familiar and widely grown ornamental palms in the world. For more than a century this elegant slow-