

mancy—this may be caused by inhibitors or something else like this. I don't know. It's questionable in my mind whether light would have any effect on both aspects of double dormancy.

MODERATOR HASEK: We are to have a panel on our next segment, which is on seed handling. We will start with Gene Baciu.

## PROLONGING SEED LIFE

EUGENE BACIU

*Mistletoe Sales, Wholesale Seeds  
Santa Barbara, California*

Seeds of short life have presented problems for the nurseryman for centuries. In the days of the sailing ships, expeditions were made to gather plants from all over the world. Many of these plants had to be grown in containers on the ships and, in most instances, it took years to transport these plants to Europe and other countries. The steamship helped tremendously in transporting the plants that bear short-lived seeds. Then came the airplane and now we have jets that can transport the seeds from any place in the world to the grower in a few hours. Of course, at times it has taken up to six weeks to get them out of Customs. I have had seed received from Thailand by Customs on August 2 which were not released until September 16, resulting in very poor germination. I was unable to get a reason from Customs for their refusal to release my shipment. Perhaps some work could be done with Customs to shorten this period of time.

Resulting from our changing habits of living, we have developed a desire for small plants to be available at any time of the year. Now the problem is a method of prolonging the life of seeds so that we may reach this goal.

During the past several years, I have been working with moisture and temperature control methods and have had some success with the following seeds. *Dizygotheca elegantissima* seed viability is usually 8 to 10 days. With the right amount of moisture and temperature control, (35° F.), the viability has been increased to 6 months with 90% germination. *Syzygium paniculatum* (*Eugenia myrtifolia*) retains its viability for about one week; now with refrigeration the seed can be kept about two months. At the end of this time, remove the seed from cold storage and germinate them, just enough for the seed to crack. Then return them to the refrigerator at a temperature of 34° to 38° F. By doing this we have added 6 more months to the life of *Syzygium paniculatum*, for a total of 8 months. *Magnolia grandiflora* has been a

real problem for the propagator who is unable to harvest his own seed. *Magnolia* will lose its viability in 10 to 15 minutes, if exposed to direct sunlight. With a temperature of 32° to 35° F., *Magnolia* seed has been stored for 5 months with over 4,000 plants obtained from 1 lb. of seed. California native *Quercus* seed must be kept at a moisture content of not less than 65% and under cold storage at 35° F. In California, *Quercus agrifolia* seed is harvested in October; with proper storage we have had seed showing 85% germination one year later.

Seeds of other species that may be stored for many months in the same manner are: *Rhaphiolepis*, *Fatsia*, *Philodendron* and *Eriobotrya*. *Philodendron* seed after being cleaned, has kept its viability for over two years. *Eriobotrya* seed has been kept for over a year with 95% germination. If the seed shows dryness, the best way to add moisture is to wash the seed and let it drain, then return it to cold storage. With more study along these lines, we will be able to have seed available for germination during any time of the year.

MODERATOR HASEK: Thank you very much, Gene. Now we will hear from Dr Will Bitell, Dept. of Biological Sciences, University of California, Santa Barbara. Dr. Bitell<sup>1</sup>

MODERATOR HASEK: Last in this session will be a talk by Betty Atwater of the Ransom Seed Laboratory here in Santa Barbara. Betty:

**SEED DORMANCY AND GERMINATION**  
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Our knowledge concerning the nature of the germination process in seeds constantly progresses and we are gradually beginning to understand some of the complex physical and chemical mechanisms which control a seed and determine when germination will occur. The preservation of the species has been assured by the incorporation of various delays in the growth so that all of the seeds will not germinate at once. This unevenness of germination is especially noticeable in perennials and in native and ornamental plants. Most of our common vegetables and flower annuals have been selected over so many years that fast and complete seed germination is normally expected of them.

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<sup>1</sup>Ed. Note: Dr. Bitell spoke on his experiences in seed handling.