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A PRELIMINARY REPORT ON VEGETATIVE PROPAGATION OF CALIFORNIA LIVE OAKS FOR DISEASE RESISTANCE¹

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Since about 1981, a branch dieback of oaks caused by *Diplodia quercina* has become rather widespread in California. This disease is most severe during dry years. More recently, twigblights caused by at least two fungi: *Cryptocline cinerescens* and *Discula quercina*, have also become a serious problem in California. These fungi cause most damage during wet years. The diseases occur in landscaped as well as non-landscaped areas of California and can be serious on *Quercus agrifolia*, *Q. lobata*, *Q. kelloggii*, *Q. chrysolepis* and *Q. wislizenii*. They have also been recorded on *Q. douglasii*, *Q. robur* and *Q. suber*.

Sixteen native oak species are recognized in California. These belong to three subgenera: the intermediate oaks, the black oaks, and the white oaks. However, extensive hybridization within each subgenus has been well documented, resulting in highly variable intermediate types. Noticeable differences in disease susceptibility and levels of insect attacks of individual trees have been observed. For instance, it is quite common to see two *Q. agrifolia* trees side by side, one with severe infection of twigblight, the other with a negligible amount. It is customary in California to produce oaks

¹ Poster Presentation

from acorns, since they germinate readily and with a high percentage of success. Other means of propagation are difficult but some techniques have been found to be quite successful in producing oaks of a known genotype.

With that in mind and our desire to provide the nursery trade with oaks that may be resistant to those disfiguring branch and twig diseases, we set out to test rooting and grafting techniques for *Q. agrifolia*. Once the techniques are refined to yield a satisfactory level of success, source material could be selected on the basis of a number of additional desirable horticultural characteristics such as shape, moisture or drought tolerance, and resistance to insect attack.

We have adapted a technique used in the Netherlands (1) to graft *Q. robur* 'Fastigiata' and *Q. frainetto* commercially and have to date 45 successful grafts with 150 currently in the process of developing callus. We are trying to determine in which month we get the highest percentage of successful callus formations by making 30 grafts each month of the year. The Dutch workers found that they got a higher percent take when the grafts were made in the fall than in the winter months.

We have used 2-year old rootstock and selected scion material from apparently healthy and from susceptible mature trees. We will test a number of our grafted plants by planting them outdoors in an environment where the pathogens are known to occur. We will also test-graft oaks by making inoculations with the twigblight organism in the spring of 1989 in our greenhouse to see whether we can detect a difference in the susceptibility of the grafted plants to the diseases in question.

We also have 46 rooted oak cuttings, 12 of which are excellent, the tallest and strongest having grown to a height of 80 cm in just 16 months. However, the technique of etiolation of shoots to achieve rooting (2) is difficult to adapt for shoots from mature trees and, therefore, this method may not be as practical as producing grafted plants.

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