words, first or second order branches of lower branches. We haven't tested this.

PROPAGATING EUCALYPTUS FROM CUTTINGS

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The selection of evergreen shade trees for southern Arizona is limited due to temperature extremes between winter and summer. It is not unusual for temperatures to range above 100°F. in July and August, and there are instances when the temperature will go above 110° F. accompanied by low humidity and hot dry winds. At the other extreme, winter temperatures will drop below 20° F. and remain at this low level for several hours. Survival of trees under these extremes of temperature is limited to a very few specimens including *Rhus lancea,* Olive, Pepper tree and Eucalyptus.

Eucalyptus rostrata and *Eucalyptus polyanthemos* represent two species which are in widespread use throughout the lower elevations of southern Arizona. They survive the environment conditions just mentioned, but there has been observed a noticeable change in the appearance of tree shape and foliage characteristics of trees growing in home yards and in parks.

Landscape architects have indicated a need for eucalyptus of uniform characteristics to achieve the desired effect of uniformity in their landscape plantings. Nurserymen have also been aware of the need for more uniformity in the growth habits of eucalyptus, but their experience with the rooting behavior of these trees have made it uneconomical to propagate them vegetatively.

The Horticulture Department, University of Arizona, initiated vegetative propagation studies several years ago and observed some erratic rooting behavior of the *Eucalyptus rostrata* and *polyanthemos*.Cuttings taken from trees showing any indication of iron chlorosis did not root regardless of treatment used. There appears to be some clonal resistance to iron chlorosis as evidenced by photos taken of a planting of eucalyptus in one of our city parks in Tucson. Poor rooting was also experienced with cuttings taken from older trees ranging 10 years or older, regardless of the type of wood used for cutting material. A higher percentage rooting was obtained from younger trees but this presents a problem to the propagator since he cannot evaluate the desirability of these young trees at the time the cuttings are taken. This would necessitate propagating a number of cuttings from outstanding, individual young trees to serve as future propagating material if the parent trees developed desirable characteristics.

Cuttings taken from sprouts developing at the base of the trunk of old trees rooted as well as cuttings taken from young

trees. The amount of material obtainable from this source would be limited but the growth habits of the tree would already be established.

The cutting material used in the propagation tests included greenwood, soft wood, semi-hardwood and hardwood. The cuttings were obtained at different times of the year: July, September, November and March. Decay of greenwood and softwood cuttings was much greater than for the other types of wood.

The combination of napthaleneacetic and indolebutyric acid (2 grams NAA, 2 grams IBA per 100 cc 45% ethyl alcohol) gave the best rooting results of all the compounds used in the tests. The basal one inch of each cutting was wounded with a razor blade in three different locations prior to a three-second dip in concentrated growth regulators.

The rooting medias consisted of perlite, vermiculite, sawdust, sand and various combinations of these compounds. There was no appreciable differences in the percent rooting of the cuttings in the different medias.

The cuttings were placed under intermittent mist (on 10-seconds, off 2 minutes) and bottom heat was set at 70° F. Full sunlight was permitted except during the summer months when some shading was necessary to prevent sunburning. The time required for rooting varied from 10 to 12 weeks.

Under our conditions, cuttings taken in early March gave the best rooting response. The highest percentage rooting obtained with *rostrata* amounted to 65%. There were some species of eucalyptus which would not root regardless of treatment or time of year.

DR. WALTER LAMMERTS: Have you tried *Eucalyptus ficifolia?*

MR. FAZIO: No. We have trouble trying to grow them in Tucson. They will not survive our climatic conditions and no propagating material was available for testing purposes.

DR. LAMMERTS: Have you tried cutting old trees back one third their height and taking cuttings of forced growth after this pruning?

MR. FAZIO: No. This may work and will be included in some of our future tests. We have observed that propagating material taken from younger trees gave us the best rooting response. You may have outstanding young trees two or three years old and not know for sure what their characteristics are going to be when they approach maturity. We are attempting wounding techniques to obtain sprouts on the lower portion of outstanding old trees for cutting material.

MR. GREG TAKSA: How do you apply honey? Does it work?

MR. FAZIO: One citation in the literature indicated honey was used in the rooting of cuttings. The question of how do

you apply honey to cuttings. It was diluted in water and used as a soak but we gave it up because of a decay problem.

MR. FRED REAL: What type of propagation materials do you use?

MR. FAZIO: We use semi-hardwood stem cuttings about one quarter of an inch in diameter. Each cutting measured approximately five to six inches in length and contained one to three leaves.

MR. RALPH MOORE: What about wounding? What is the length of eucalyptus cuttings?

MR. FAZIO: Five to six inches in length. Making three cuts through the bark with a razor blade approximately one inch long near the bottom end of the cutting resulted in a higher percentage of roots.

MR. BRUCE BRIGGS: Did you run any tests for the reason for making three wounds rather than just one wound?

MR. FAZIO: No. They were made on three equal sides; possibly one would have been sufficient.

DR. LAMMERTS: Did the shoots from which the cuttings were taken come from the base of the tree right near the soil.

MR. FAZIO: Yes, at the soil line.

VOICE: Did these new shoots from the base that came following wounding have the form of seedlings or mature leaves?

MR. FAZIO: They showed characteristics of mature leaves; there was no evidence of juvenility.

IV. Bedding Plants and Ground Covers

MODERATOR: Mr. Carl H. Zangger

PROPAGATION AND GROWING OF GROUND COVER PLANTS AT PERRY'S PLANTS, INC.

CARL ZANGGER
Perry's Plants, Inc.
La Puente, California

Perry's Plants are primarily growers of bedding and ground cover Plants. We produce several hundred thousand flats of annual and perennial bedding plants as well as over 100 varieties of herbaceous and woody types of plants used for ground cover planting purposes. All of our production of ground cover plants, with a very small exception, is sold by the flat of 64 to 100 plants depending upon the variety. The great majority of these plants are sold at a price varying from .02c to .03c per plant. You can see that it then becomes necessary to produce saleable varieties at an absolute minimum of cost. This price includes not only the rooting and growing of the plant, but must also cover all other costs of doing business, and allow a small profit as well. Simplification and standardization of procedures is an absolute necessity. All varieties are rooted, grow on and