

Research

AVOCADO TESTING

In cooperation with the Variety Committee of the California Avocado Society, the Arboretum planted a collection of young trees to demonstrate the different kinds of avocados suitable for home growers in the Los Angeles area.

The plantings will show home owners the form of the trees as well as productivity and quality of the fruit. Close attention will be given to how well they will grow, with particular reference to frost resistance.

Varieties included: Bacon, Emerald, Carlsbad, Rockwood, Zutano, Irving, Haas, Fuerte, Murrieta, Anaheim, MacArthur, Rincon, Nowels, Ryan, Elsie, Bonita, Corona, Frey, Mesa and Dailey.

This collection of young trees was planted on the south side of Tallac Knoll.

FLOWER CARPET RESEARCH

Living carpets of flowers in vivid colors, which could be snipped by the yard, foot or in designs for floral decorative purposes, are a most likely southern California growing project.

This novel idea was originated by Dr. Frits W. Went, of the California Institute of Technology, Pasadena. With a grant of \$18,000 from Longwood Gardens, Kennett Square, Pa., and the Longwood Foundation, Wilmington, Del., the research was started in January, 1957. Both Dr. Went and Dr. Stewart have been supervising the work.

The first phase of the work was carried out by Mr. Francis Ching. After trying sponge rubber, burlap, cloth and peat moss, Mr. Ching determined that an inch thick flexible plastic foam, 'urethane' was the most suitable for growing plants on a carpeting material.

In starting a flower carpet, the plastic is first cut to the desired size and shape and then placed on an inert sub-medium consisting of fine gravel and vermiculite. Seeding is done directly on the surface of the urethane foam and upon germination the roots penetrate through the pores of the plastic. During this period, the material is kept moist through applications of water. After the first leaves appear, the plants are fed by a specially formulated liquid nutrient at regular intervals. Thus, it can be seen that the method by which these carpets are grown is essentially one of modified hydroponics.

More recently, Mr. Ronald Cross, continuing the research, has been using dwarf annual flowering California desert plants. These plants flower when only an inch or two in height. Possibilities are being studied for using wildflowers of Western Australia and South Africa for carpets. In addition to nutrient feeding techniques and selection of suitable plant material, Mr. Cross has been investigating the use of root spray feeding, the effect of photoperiod on flowering time and the effect of temperature on germination.



GENERAL VIEW OF FLOWER CARPET PROJECT IN GREENHOUSE. BENCHES IN FOREGROUND CONTAIN NEWLY SEEDED AND GERMINATING CARPETS. BACKGROUND BENCHES ARE CARPETS IN MORE ADVANCED STAGES.



FOUR SMALL CARPETS WITH FOUR DIFFERENT TREATMENTS. URETHANE PLASTIC AS BASE IN WHICH PLANTS ARE GROWING LAY ON A MIXTURE OF VERMICULITE AND GRAVEL.

AN AIR POLLUTION TEST PROJECT

Starting with 100 white leghorn chicks, a new air pollution test got underway, sponsored by the State of California Department of Public Health. The Arboretum was one site and a parallel test with genetically similar chicks was established on the same day in a less smog afflicted city some miles east of the Arboretum. This test on 1-day old chicks, for a period of 12 weeks, was a pilot project to point the direction of further smog research.

The project was under the supervision of Dr. Earl J. Catcott, Los Angeles office of the State Health Department. Dr. Wm. D. Urban made the observations of effects on the chicks.

Scientists will study the differences in the health of the birds in the two test locations. Respiratory diseases are a major cause of death in chickens.

GIBBERELLIC ACID

Clonal varieties of Paphiopedilum Maudiae 'magnificum' (Lady slipper orchids) were treated with gibberellic acid, a plant growth regulator hormone. Applications were made to the apex of each plant growth. In some cases, a second flower was produced from a 'leaf bract' which normally produces no flower. Accompanying this response, internodes of the plant elongated. No commercial benefit could be ascribed to the use of gibberellic on orchids at this time; however additional experiments with cypripediums and cymbidiums are being conducted.

A second experiment was conducted using gibberellic acid as a seed treatment. At a concentration of 250 ppm (parts per million) G.A., an increase in the amount of germination of certain California wildflower seeds was observed. It also was observed that this treatment was more effective on older seeds than on the younger or fresher seeds of the same species. Work continues on these experiments.

Both of these experiments were reported at the American Institute of Biological Science Meetings, August 25-29, 1957, Stanford University.

GROWTH REGULATORS IN ORANGES

A study of growth regulators in Washington navel oranges was carried out during the spring of 1958. Mr. Coenraad Beyers, a visiting scientist from the Transvaal, Africa conducted this work jointly at the Biology Department, California Institute of Technology, Pasadena and at the Arboretum.

On the basis of methanol extractions of developing ovaries and peduncle tissue, growth stimulating compounds (indoleacetic acid and indoleacetonitrile) as well as a growth inhibiting substance were found.

FIRE RESISTANT PLANT MATERIAL

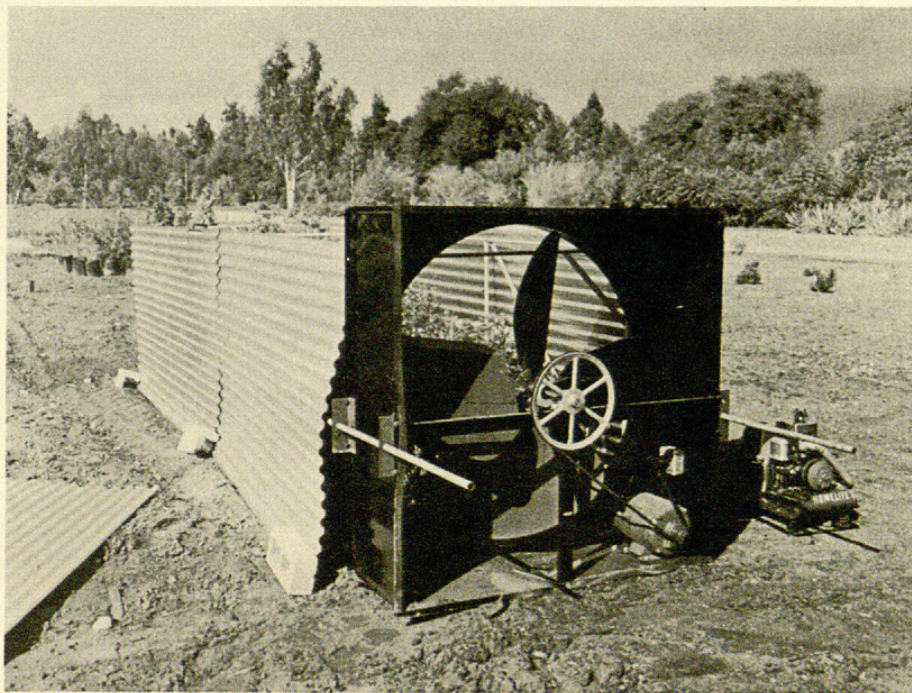
The study continues for additional fire resistant and drouth resistant plants for re-forestration of the southern California mountain slopes.

To facilitate this work, a new muffle furnace was obtained for the leaf burning screening tests (reported 1956-57). More accurate data are now obtained through the heat control device incorporated in the furnace.

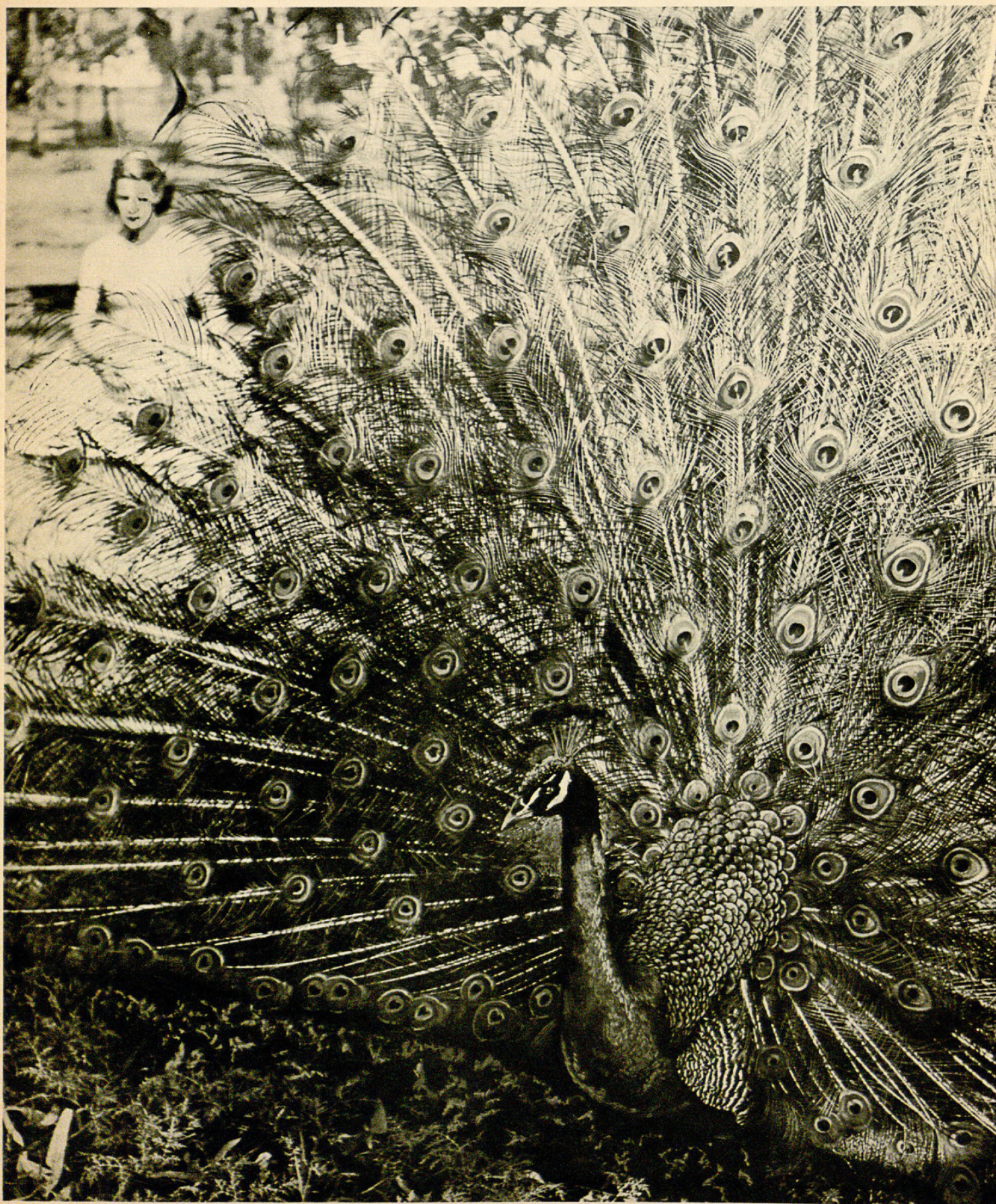
Methods of germinating seed of fire resistant plants using gibberellic acid were initiated to develop more rapid and efficient germination of field sown seed. This will be of much value, where germination depends entirely on winter rains.

Wax milk cartons, containing a small amount of soil and *Cistus* seedlings were placed in the greenhouse to: 1) determine the break-down pattern of the cartons and 2) growth rate and survival of the *Cistus* seedlings. If successful, this method will provide an inexpensive and light weight container for mass field plantings of *Cistus*.

A portable fire tunnel came under construction for use in field testing mass plantings of native and exotic vegetation. A flame will be started at the fan end of the tunnel and the time recorded for the flame to reach the opposite end, 16 feet away. Burning patterns and extent of burning of the plants will also be observed. The results from these tests will throw light on how stands of pure and mixed species might best be grouped to give the maximum fire protection throughout the year.



THE FIRST PORTABLE FIRE TUNNEL SET TO SIMULATE A FIELD TEST. THE FAN IS IN POSITION AT ONE END OF THE TUNNEL. A FRAME OF ALUMINUM TUBING SUPPORTS ROOF AND SIDES OF CORRIGATED ALUMINUM SHEETS.





1958. "Research." *LASCA miscellanea* 1958, 40–45.

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