

RESEARCH DIVISION

A reduction in personnel in the Research Division over the past two years has resulted in the termination of four ongoing research projects: fire retardant plant project, crape myrtle breeding project, air pollution plant damage project, and the South African trailing daisy root-rot-resistance breeding project.

The effect of these terminations is varied. The investigation of damage to plants from air pollution is of critical importance; however, because the federal government has spent and continues to spend a great deal of money in research grants for this study throughout the country, its termination at the Arboretum is not a major loss. The loss of the crape myrtle project, which was aimed at improving ornamental values and increasing resistance to mildew was unfortunate because it left the project at the halfway mark with a considerable body of unfinished work. The study of fire retardant plants had been going on for many years at the Arboretum, and, although work remains to be done, had produced tangible results in the form of publications useful both to the public and other County agencies. The South African trailing daisy project was exclusive to the Arboretum, which had introduced the plant and made it popular and useful in Southern California. A study to determine the cause of the root-rot that developed would have made its continued wide use along freeways and interchanges practical.

Despite the cutback in local research support, the Department's research activities have been well supported by grants from the National Science Foundation in Washington, D. C. It should be noted that the NSF provides financial support to selected research projects around the country whose proposals are deemed the most relevant to national needs. It is indicative of NSF recognition of this division's value that two of its four submitted proposals were funded in this biennial period.

The titles and objectives of the two funded proposals are:

- 1) Alternative Biological Sources of Materials -- to meet current future materials resource requirements and to identify and develop domestic sources of or substitutes for raw materials which presently must be imported.
- 2) Community Water Management -- to address our need for fundamental knowledge and its application regarding the management of water at the community level. The goal is to explore innovations in water and wastewater management to maintain acceptable levels of health, safety, and environmental quality.

The first proposal became the major research project at the Arboretum, a three-year program under the title "Breeding Improvement of Rubber Yield in Guayule." The origin of this program goes back to World War II when the desert shrub guayule, known for its high quality rubber content, was grown extensively in the southwest states for the purpose of furnishing rubber for the war effort. After World War II, the production of synthetic rubber from oil and the resumed supply of natural rubber from abroad made guayule unprofitable and its plantations dwindled and vanished. The Middle East oil crisis in the early seventies has since reversed the situation. Guayule is now recognized as a potential source of natural rubber which can be produced in the United States with the advantage of being able to grow it on semi-arid, marginal land.

In 1977, the NSF gave an initial grant to the Los Angeles State and County Arboretum of \$97,536. The goals of the grant, then and now, are to develop higher yielding strains of guayule and to develop methods of culture so as to make the crop commercially feasible. The first task, now completed, was to collect germplasm from all available sources, mainly from the native guayule populations of Mexico, and then begin the long task of selection and hybridization to improve the crop.

In 1978, the NSF made grants of \$90,930 to LASCA and \$55,896 jointly to LASCA and the U.S. Department of Agriculture. The research objectives of this grant are to identify the chemicals and dosages necessary to cause stimulation of rubber synthesis in the guayule plant. Studies by Dr. Henry Yokoyama of the USDA Fruit and Vegetable Chemistry Laboratory and coinvestigator on the project with Dr. George Hanson of the Arboretum, have shown that rubber yields can be dramatically increased by proper use of the identified chemicals.

Grants to the Arboretum for the 1979-80 period totalled \$233,131, divided as follows: \$144,056 to LASCA from the NSF; \$65,825 jointly to LASCA and the USDA from the NSF; and \$23,250 from the California Department of Food and Agriculture to LASCA.

Five full-time research assistants are employed for this project, plus two and one-half research assistants for the cooperative projects with the USDA and one and a quarter for the CFA project. Most personnel came from California Polytechnic University and the University of Santa Barbara.

As a result of the LASCA guayule research projects, the research division and its staff are considered worldwide authorities on guayule and receive numerous requests for seeds and information concerning guayule growth and prospects for commercialization. The division's guayule researchers also serve as consultants to other guayule research projects, maintain contact with commercial rubber companies in the United States, present scientific papers at various professional seminars, and have provided seed to 34 educational, research, and commercial agencies and companies all over the world.

The second funded research project brought a two-year NSF grant in the amount of \$76,766 starting in May, 1977. Recycling of municipal sewage water for agricultural and recreational purposes has shown promise as a practical method of waste disposal. However, certain pollution hazards exist resulting from the toxicity of heavy metals and possible infectious diseases found in waste water and sludge. Factors that affect the survival of pathogenic viruses in soil need to be known before any general application of waste water and sludge to land can be safely utilized. The objectives of this NSF grant was to investigate the mechanisms of antiviral activity soil and assess its significance with regard to application of municipal waste water on land used for agricultural purposes. Research has so far shown that antiviral properties in soil vary with soil temperatures, at different depths, and at different sites, and that antiviral activity in soil can be stimulated.

Scientific papers on this project were presented at three-day conferences at the University of New Hampshire (August, 1977) and the 70th Annual Meeting of Soil Science Society of America in Chicago (December, 1978). Nine students from California State Polytechnic University and Long Beach State University served as half-time research assistants on the project.

Copies of the semiannual report are being distributed through the U.S. Department of Commerce in response to requests for research information.



1961. "Research Division." *Biennial report 1977-79*, 25–26.

View This Item Online: <https://www.biodiversitylibrary.org/item/139508>

Permalink: <https://www.biodiversitylibrary.org/partpdf/145404>

Holding Institution

Missouri Botanical Garden, Peter H. Raven Library

Sponsored by

Missouri Botanical Garden

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the rights holder.

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://www.biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.