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Progress Report

on

**Maintaining Biological Diversity of Threatened
Multipurpose Species in Central America**

by

Vegetative Propagation

Project No. 8.106

by

Robert Kellison, William S. Dvorak and Ronnie de Camino

for period

June-December, 1988

Personnel Changes

The senior author of this progress report, R.C. Kellison, was named Interim Director of the Central America and Mexico Coniferous Resources Cooperative (CAMCORE) on January 1, 1988. He has temporarily replaced William S. Dvorak who serves as technical advisor to the cooperative while he completes the requirements for his Ph. D. Degree. This arrangement will extend to June 30, 1989 when Mr. Dvorak is scheduled to re-assume the directorship of CAMCORE. Because of the changes in administration of CAMCORE the U.S. AID project (No. 8.106) is similarly affected. Dr. Kellison has assumed administrative responsibility for the project and Mr. Dvorak and Dr. de Camino remain as co-investigators.

Status

Progress has been made on many fronts in preparation for seed and cutting collection which is to begin about February 1, 1989. Of the six hardwood species being investigated (Albizia guachapele, Alnus acuminata, Bombacopsis quinata, Cordia alliodora, Sterculia apetala, and Vochysia hondurensis), only Vochysia hondurensis produces significant quantities of seed during the summer and fall (after the project was approved), as well as late winter through late spring. Efforts were made in Costa Rica, Guatemala, and Honduras to locate superior phenotypes of the species and to collect limited amounts of seed as a pilot-

plant project. The result was that the viability of Vochysia hondurensis seeds lasts only several weeks, and therefore cannot be shipped to North Carolina State University for storage and deployment to CAMCORE members for genetic testing as was proposed in the project plan. The alternative is to ship the seed directly to CATIE, Turrialba, Costa Rica where nursery and greenhouse beds will be waiting to receive the seed.

Preliminary work on vegetative propagation of the six species has also been conducted. Dr. R. R. B. Leakey, Institute of Terrestrial Ecology, Penicuik, Scotland served a one-month consultancy on vegetative propagation at CATIE during October 1988. Being an authority on vegetatively propagating the tropical hardwoods of Africa, especially Triplochiton scleroxylon, Lovoa trichiloides, Khaya ivorensis and Terminalia superba, Dr. Leakey installed a high-humidity, polythene propagator which increased rootability of Cordia alliodora seedlings from 3 percent under the conventional system to an average of 70 percent under the new system. The propagator (Fig.1), completely enclosed by polythene including the hinged lid that fits snugly in place when closed, is a wooden frame structure that contains a 3-inch layer each of rounded or angular stones and gravel, on top of which sits a 6-inch layer of rooting medium. Sitting beneath a shade-cloth canopy of 50 percent rating, the propagator is filled with water to the bottom of the rooting medium. This convention allows the stuck cuttings to root in an environment of high humidity without surface watering.

A noticeable effect of the system is that the cuttings remain green and firm even after several weeks whereas cuttings in the conventional system which are surface watered by a misting system are in various stages of decay.

Based on the results obtained by Dr. Leakey, and upon his recommendation, the experimental design of project 8.106 is being altered. Because of the short duration of the study, (three years), the hesitancy of land owners to have selected phenotypes of the six species cut down for the production of sprouts for rooting, and of the uncertainty of getting all genotypes back to the same level of juvenility from serial grafting, the decision has been made to compare the performance of seedlings against cuttings from seedlings. This alteration will allow us to make greater genetic gain because the cuttings will be obtained from seedlings of a select phenotype in which case a selection differential can be imposed upon the seedling population.

Efforts to induce basal and root sprouting from mature trees will be implemented by all cooperators in Costa Rica, Guatemala, and Honduras and perhaps in Mexico, Colombia and Venezuela. Rather than felling the trees, however, they will be scored for induction of adventitious sprouting. In the first year, adventitious sprouts only from Costa Rica will be stuck as part of the rooting study; sprouts produced by the other cooperators can be stuck or not, depending upon the cooperator's interest. The purpose of this exercise is primarily to determine if sprouts

for rooting can be induced without destroying the selected tree. The secondary objective, for Costa Rica only, is to see if the sprouts root and perform similarly to seedlings from the same tree.

Coordination of the Project

Because of the difference in biology in the six species of study, the difference in environment covered by the range of the species--from Colombia and Venezuela to Mexico, and of the several cooperators who represent different countries, concern exists about coordinating all facets of the far-ranging project. To smooth the way, R. C. Kellison spent December 7 - 13 in Costa Rica, Guatemala and Honduras, organizing a workshop which will be hosted by CATIE on January 23 - 24, 1989, to make decisions about when seeds from the various species are to be collected, how they are to be processed, where and how they are to be sent, etc. For example, (as mentioned before) evidence shows that seeds of Vochysia hondurensis lose viability within days of collection. Therefore, the recommendation will be to ship those seeds to CATIE by air freight within 24 hours of collection. Other decisions of a similar nature will be made following the technical session and the field trip on January 23 and 24, respectively, in Costa Rica. Procedures for scoring the selected trees without doing irreparable harm to induce sprouting will also be detailed.

Participants in the workshop (agenda attached) will include representatives from Costa Rica, Guatemala, Honduras, Mexico, Colombia, Venezuela, England and United States. CAMCORE will assume the cost of travel from representatives from Guatemala, Honduras and Mexico, but that is a small price to pay to avoid confusion and missed schedules.

Action Plan for the Next Reporting Period

Money has been transferred from North Carolina State University to CATIE (Costa Rica) (\$23,220) for the purchase of a double-cabin pick-up truck, for greenhouses, for technicians and for associated costs to initiate the project. Similarly, money is being transferred to Honduras (\$17,000) for the purchase of an AMC Cherokee landover, and associated equipment (\$1400.00) and to Guatemala(\$2,200) for seed collection.

Seed collection will begin about February 1, 1989. The schedule for deployment of the seeds to the active participants, and to other CAMCORE members as defined in the Plan of Work will be finalized at the January 23 - 24 workshop. Minutes of the workshop will be made a part of the next progress report.



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AGENDA

Workshop

on

Maintaining Biological Diversity of Threatened
Multipurpose Species in Central America

January 23 - 24, 1989
Turrialba, Costa Rica

January 23

- | | | |
|------------|---|---------------------------|
| 8:30 a.m. | Welcome and Introduction | de Camino
& Kellison |
| 9:00 a.m. | The CATIE Experience--Seed Collection,
Vegetative Propagation | Mesén |
| 10:00 a.m. | Research of <u>Cordia alliodora</u> | Boshier |
| 10:30 a.m. | Break | |
| 11:00 a.m. | The Honduran Experience on Hardwood
Seed Collection and Seedling
Production | Ochoa
Gutiérrez |
| 11:45 a.m. | Hardwood Seed Collection in Guatemala | |
| 12:15 p.m. | Lunch | |
| 1:30 p.m. | Plantation Programs of <u>Bombacopsis
quinatum</u> and <u>Sterculia apetala</u> | Kane |
| 2:15 p.m. | Tropical Hardwood Experience in
Venezuela | Jurado-Blanco
Dcrantes |
| 2:45 p.m. | Hardwood Seed Collection in Mexico | |
| 3:00 p.m. | Break | |
| 3:30 p.m. | Guidelines and Decisions for
Implementing the Program | Kellison |
| 5:30 p.m. | Adjourn | |

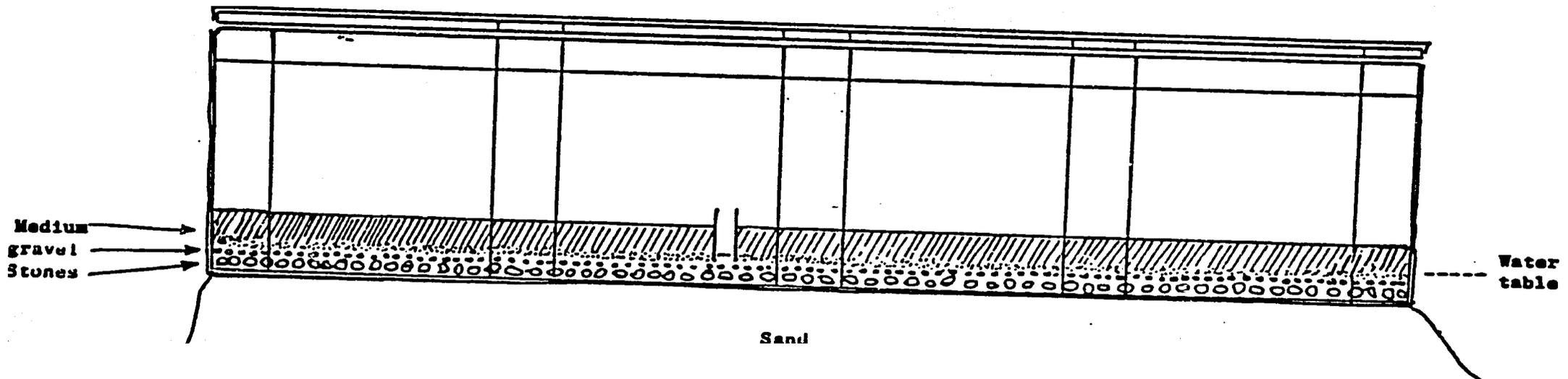
January 24

- | | | |
|-----------|--|--|
| 8:00 a.m. | Field Trip (to include stops at CATIE's nursery to see
vegetative propagation of hardwoods, and field stops to
see select trees of various hardwoods). | |
| 5:00 p.m. | Adjourn | |

Fig. 1.

An improved design for a high-humidity polythene propagator.

Shade cloth



FINANCIAL STATUS REPORT

1. Federal Agency and Organizational Element to Which Report is Submitted: Agency for International Development
 2. Federal Grant or Other I.D.#: DPE-5542-G-SS-8010-00

3. Recipient Organization:

North Carolina State University
 Box 7214
 Raleigh, N. C. 27695-7214

4. Employer I.D. : 56-6000756
 5. Recipient Account #: 72001339
 6. Final Report: Yes No X
 7. Basis: Cash Accrual X

8. Project/Grant Period: From 06/01/88 To 05/31/91
 9. Period Covered by This Report: From 07/01/88 To 09/30/88

10.

STATUS OF FUNDS

Programs/Functions/Activities))	(a)	(b)	(c)	(d)	(e)	(f)	(g) Total
a. Net outlays previously reported		0.00					0.00
b. Total outlays this report period		28,676.70					28,676.70
c. Less: Program income credits		0.00					0.00
d. Net outlays this report period		28,676.70					28,676.70
e. Net outlays to date		28,676.70					28,676.70
f. Less: Non-Fed share of outlays		0.00					0.00
g. Total Fed share of outlays		28,676.70					28,676.70
h. Total unliquidated obligations		0.00					0.00
i. Less: Non-Fed share, line h.		0.00					0.00
j. Fed share of unliquid. obligations		0.00					0.00
k. Total Fed share, outlays & unliq. obl		28,676.70					28,676.70
l. Total cumulative Fed funds auth.		148,571.00					148,571.00
m. Unobligated balance Fed. funds		119,894.30					119,894.30

11. Indirect Expense: c. Base \$ 23,220.00
 a. Type rate NTDC
 b. Rate 23.5%
 d. Total amount \$ 5,456.70
 e. Federal share \$ 5,456.70

13. I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays and unliquidated obligations are for the purposes set forth in the award documents.

Signature Earl N. Pulliam Date 11-27-88
 Earl N. Pulliam, Director, Contracts & Grants
 Telephone 319-737-2153

12. Remarks