

**A SHORT HISTORY OF THE BANCO
LATINOAMERICANO DE SEMILLAS
FORESTALES (BLSF) AT CATIE,
TURRIALBA, COSTA RICA**

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**Instituto Nacional de Investigaciones
Forestales**

(INIF)



**CENTRO AGRONOMICO TROPICAL DE INVESTIGACION Y ENSEÑANZA, CATIE
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INTRODUCTION

A regional project for forestry development, education and research (UNDP/SF project LAT/REG/8) was established in 1966 at Turrialba. One of the subprojects was the creation of a series of trials of fast growing tropical tree species which were believed to have potential for alleviating the increasing shortage of wood in the Central American region. In the initial stages a formal circular letter was sent to the forestry authorities in 54 countries, explaining the intention of the project and requesting assistance in the supply of tree seed. Each letter was written with particular reference to the desired species known to grow in the country to which it was addressed, either as a component of the native flora or as a well established exotic. In this way up to 20 requests were made for the seed of a single species. The results of this postal survey were unexpectedly poor:

- 1) 60 per cent of the addressees did not reply
- 2) 10 per cent indicated that they could not assist
- 3) 10 per cent replied that they could supply seeds only in the following collecting season
- 4) 20 per cent sent seeds to the project but 30 per cent of the lots did not germinate.

As a result of this experience the project set up the Banco Latinoamericano de Semillas Forestales (BLSF) in 1967, to supply its own needs and those of other Latin American countries, either through purchase and sale or through seed exchange. The BLSF has been staffed as follows:

Supervisor	Technician	Period
H. Barres	R. Morales P. Skov Larsen Gerhard Dirsche1	1966-71 1966+part-time 67-71 1967-58 1969-71
R. Morales J.L. Whitmore J. Hudson N. Gewald	R. Morales O. Ovaes	1972-73 1974-75 1976 1977-1980 1974-80

PHYSICAL FACILITIES OF THE BLSF

Although a cold store was available from the beginning, it was not possible to prevent the continued ingress of atmospheric humidity. Inside the store the relative humidity was always in the range 80-95 per cent. Consequently germination capacity was lost very quickly. In 1972/73 an existing building was converted by CATIE to give improved storage conditions, at a cost of US\$6,500 including the refrigeration and dehumidifying equipment. Details of the construction are given by Morales (1975). The cold store (+5°C and 30-40 per cent relative humidity) provides 55 m³ of capacity. One of two 3 hp refrigeration units is run in alternate months, so that storage temperature is maintained as long as the electricity supply is reasonably constant. The dehumidifier can extract 13 kg of water per hour. Refrigeration units and the dehumidifier have individual thermostat and humidistat controls.

In 1978, with the financial assistance of the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, the Genetic Resources Unit of CATIE supplemented the existing short-term + 5° store with a drying room and a long term -20°C unit of 105 m³. Two 5 hp compressors alternate to give constant cooling. The initially crude seed treatment equipment has been augmented by having access to the facilities of the Genetic Resources Unit. The original cooling equipment in the short-term store was also replaced by the Genetic Resources Unit (Goldbach 1979).

STANDARDS OF SEED PROCESSING

The empirical methods used in the past by the BLSF are being replaced by those recommended by the International Seed Testing Association (ISTA). Standard forms have been devised to record the results of each stage of seed processing, so that customers may be assured of the quality of their purchases. A manual, which describes the methods in detail, is being written for the BLSF.

QUANTITIES OF SEED SUPPLIED

Over the past 13 years the BLSF has supplied seed of 188 tree species (from 86 genera in 30 families; see annex 1) to 90 territories (annex 2). Annex 3 lists the principal species. In 1978 alone, the BLSF supplied 200 lots from 45 species to 18 countries, mostly within Latin America. It will be seen that the BLSF's influence is worldwide. It is therefore especially important that it maintains the highest standards of seed processing as well as business procedures.

SEED IN STOCK

In the past the BLSF has attempted to maintain small stocks of seed of tropical species which are not found in (or do not produce viable seed in) Costa Rica. These stocks were intended to supply 500-1000 seedlings per lot. For local and for well established exotic species the stocks held were and are considerably larger. However the BLSF does not deal in large quantities of seed for big reforestation programmes. Also, as it is intended to be self-financing, it does not distribute seed gratis. For research purposes it prefers to exchange lots of seed with other suppliers. The most recently distributed seed list carries a bilingual text on the terms of sale and exchange.

FUTURE ACTIVITIES

1. Central American firewood projects

This six-year project is being undertaken by the Program of Natural Renewable Resources of CATIE with finance from ROCAP*. A principal list of 44 species to be tested for fuelwood has been prepared by the project staff. When the project has decided on its requirements in terms of the number of plants, the BLSF will obtain the seed through its wide-ranging contacts.

2. Phenological study

Most efficient collection of seed can be made only when the regional fruiting habits are known for the species of interest. A phenological study was initiated in 1972 and a preliminary compilation was prepared in mimeograph form. However the sources of the data cannot now be traced so the reliability of the anonymous compilation is in doubt. Furthermore it does not contain the necessary regional information. A new study, on marked and mapped trees, will be undertaken.

3. Vegetative propagation and seed orchards

In order to increase the supply of superior genetic material the BLSF will work closely with the forest geneticist of the Program of Natural Renewable Resources. It is expected that seed orchards will be established for the two or three most popular reforestation species in Costa Rica, and improvements will be directed especially towards good bole form.

4. Seed technology

Most effort will be devoted towards improving the methods for collecting, storing and germinating forest tree seed, so as to obtain maximum longevity and germinative capacity. The ISTA rules cover at present rather few Latin American tropical species, so a major contribution could be made by the development of standard treatments. These improvements will be incorporated into the BLSF manual of procedures, and information will be distributed through the appropriate Working Party (S2.01.06 Seed Problems) of the International Union of Forest Research Organizations.

*ROCAP: The Regional Office for Central America Programs; Agency for International Development, Department of State, Washington D.C.. The principal ROCAP office is in Guatemala City.

PUBLICATIONS

The following documents have been prepared on the activities of the BLSF:

1. DIRSCHERL, Gerhard. 1970. Forest seed directory, May 1970; a directory of suppliers of seeds of tropical forest trees. Turrialba, Costa Rica, CEI (now CATIE), UNDP/SF project LAT/REG/8, Inter-American Institute of Agricultural Sciences, Turrialba, Costa Rica. FAO accession no. 11073-70-XB. 43 p.
2. GEWALD, Nico J. 1979. Banco Latinoamericano de Semillas Forestales. In: COMBE, J. & GEWALD, N., eds. Gufa de campo de los ensayos forestales del CATIE en Turrialba, Costa Rica. Turrialba, Costa Rica, CATIE, Chapter 10.2: 338-344.
3. GOLDBACH, H. 1979. The storage facilities of the Regional Genetic Resources Project at CATIE, Turrialba, Costa Rica. Costa Rica, Turrialba, CATIE, 24 p.
4. MORALES, Róger. 1975. Banco de Semillas Forestales. Turrialba, Costa Rica, CATIE. 16 p.

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ANNEX 1: THE SPECIES THAT WERE DISTRIBUTED BY BLSF

I. GYMNOSPERMS

- Abies fraseri Poiret
- A. guatemalensis Rehder
- A. pindrow Spach
- A. procera Rehder
- A. religiosa Schlechtendal & Chamisso
- A. vezari ---?
- * A. vulgaris Poiret
- Agathis bidwillii ---?
- * Araucaria bidwillii Hooker
- Agathis brownii Bailey
(A. robusta Mueller)
- Araucaria angustifolia O. Kuntze
(A. brasiliana A. Richard)
- A. bidwillii Hooker
- A. columnaris Hooker
- A. cunninghamii Sweet
- A. excelsa R. Brown
- A. hunsteinii Schum.
- Cedrus deodara Loudon
- Chamaecypris formosensis Matsumura
- C. lawsoniana Parlatores
- Cryptomeria japonica D. Don
- Cupressus arizoniana Greene
- C. lusitanica Miller
(C. lindeleyi Klotz. ex Endl.)
- C. lusitanica Miller
- C. torulosa D. Don
- Fitzroya cupressoides Johnston
- Juniperus procera Hochstetter
- Larix leptolepis Murray
- Libocedrus decurrens Torrey
- Picea sitchensis Carrière
- Pinus ayacahuite Ehrenberg
- Pinus canariensis C. Smith
- P. caribaea Morelet var.
bahamensis B. & G.
- P. caribaea Morelet var.
hondurensis B. & G.
- P. cembroides Zuccarini
- P. chiapensis ---?
- * P. strobus L. var. chiapensis Mart.
- P. clausa Vasey
- P. cubensis Grisebach
- P. densiflora Siebold & Zuccarini
- P. elliotii Engelm.
- P. engelmanni Carrière
- P. greggii Engelm.
- P. hartwegii Lindley
- P. jeffreyi A. Murray
- P. kesiya Royle ex Gordon

- Pinus lambertiana Douglas
- P. leiophylla Schlechtendal & Chamisso
- P. merkusii Jungh & de Vriese
- P. michoacana Martínez
- P. montezumae Lambert
- P. muricata D. Don
- P. occidentalis Swartz
- P. oocarpa Schiede
- P. palustris Miller
- P. patula Schlechtendal & Chamisso
- P. pinaster Aiton
- P. ponderosa Douglas
- P. pseudostrobus Lindley
- P. radiata D. Don
- P. roxburghii Sargent
- P. rudis Endlicher
- P. serotina Michaux
- P. strobus L. var. chiapensis Martínez
- P. taeda L.
- P. tenuifolia Bentham
- P. thunbergii Parlatores
- P. tropicalis Morelet
- Podocarpus falcata ---?
- * P. falcatus R. Brown
- Pseudolarix amabilis Rehder
(P. kaempferi Gordon)
- Sequoiadendron giganteum Buchholz
(Sequoia gigantea Decaisne)
- Sequoia sempervirens Endlicher
- Thuja plicata D. Don
- Widdringtonia cupressoides Endlicher
- W. juniperoides Endlicher
- W. schwarzii Marloth

II. ANGIOSPERMS

- Acacia cyanophylla Lindl.
- A. melanoxyton R. Br.
- Acrocarpus fraxinifolius Wright & Arn.
- Ailanthus glandulosa Desf.
(A. altissima Swingle)
- Albizia falcata (L.) Fosberg
- Alnus acuminata H.B.K. ssp. argata
(Schl.) Furlow
- (A. jorullensis H.B.K.)
- A. firma Sieb & Zucc.
- A. nepalensis D. Don

Anthocephalus chinensis Lamk.
 (A. cadamba Miq.)
Antiaris toxicaria Lesch.
Aucoumea klaineana Pierre
Bagassa guianensis Aubl.
Bombacopsis quinatum (Jacq.) Dugand
Bombax malabricum DC.
Broussonetia papyrifera L'Herit Vent.
Bursera simaruba L.
Carapa guianensis Aubl.
Carapa procera DC.
Cassia grandis L.
Casuarina equisetifolia L.
Cedrela angustifolia Moç & Sesse
C. odorata L.
C. odorata L.
 (C. mexicana M. Roem.)
C. tonduzii C. DC.
Ceiba pentandra Gaertn.
Chlorophora excelsa Benth.
Colubrina ferruginosa Brongn.
Cordia alliodora (Ruiz & Pavon) Oken
Cydistax donnell-smithii (Rose) Seibert
Dalbergia retusa Hemsl.
D. tucurensis D. Smith
 (D. cubilquitzensis Pittier)
Didymopanax morototoni Decne. & Planch.
Entandrophragma angolense C. DC.
E. cylindricum Sprague
E. utile Sprague
Enterolobium cyclocarpum Griesb.
Eucalyptus acmenifoides Schauer
 (E. triantha Link)
E. alba Keinw. ex Blume
E. calophylla R. Br. ex Lindl.
E. camaldulensis Dehnh.
E. citriodora Hooker
E. cloeziana F. Mueller
E. deglupta Blume
 (E. multiflora Rich. & A. Gray)
E. deglupta Blume
E. globulus Labill.
E. gomphocephala A. DC.
E. grandis Hill ex Maiden
E. nemiphloia F. Mueller
E. jacksoni Maiden
E. kirtoniana F. Mueller
E. maculata Hooker
E. melanophloia F. Muller
E. nemiphloia ---?
 *E. melanophloia F. Mueller
E. microcorys F. Mueller
E. miniata A. Cunn. ex Schau.

E. muricata ---?
 *E. miniata A. Cunn. ex Schau
E. nesophila Blakely
E. paniculata Smith
E. papuana F. Mueller
E. pellita F. Mueller
E. pilularis Smith
E. propinqua Deane & Maiden
E. punctata A. DC.
E. regnans F. Mueller
E. resinifera Smith
E. robusta Smith
E. saligna Smith
E. tereticornis Smith
E. tessellaris F. Mueller
E. tetradonta F. Mueller
E. saligna x grandis
Flindersia brayleyana F. Mueller
Fraxinus chinensis Roxb.
F. uhdei Lingelsh
Gmelina arborea Roxburgh
Goethalsia meiantha Pittier
Guarea spp.
Guazuma crinita Mart.
Hibiscus elatus Swartz
Hymenaea courbaril L.
Juglans boliviana (C. DC.) Dode
J. olancha Stand. & Will.
Khaya anthotheca C. DC.
K. nyasica Stapf.
Leucaena leucocephala (Lam.) de Wit.
Liquidamber styraciflua L.
Maesopsis eminii Engl.
Melia azederach L.
M. dubia Cav.
Michelia champaca L.
Nauclea diderrichii Merril
Nothofagus alpina Oerst.
N. menziesii Oerst.
Ochroma lagopus Swartz
Parkia biglandulosa Wright & Arn.
Parkia spp.
Paulownia tomentosa Steud.
Pentaclethra macroloba Ktze.
Pithecellobium saman Benth
Pseudostrobilus menziesii ---?
 (Pseudostrobilus menziesii)
Salix babylonica L. x alba L.
Schizolobium parahybum Blake
Sciadodendron excelsum Gris.
Sesbania grandiflora (L.) Poir.
Shorea robusta Gaertn.
Simaruba spp.
Swietenia humilis Zucc.
S. macrophylla King

Swietenia mahagoni Jacquin
Swietenia mahagoni x humilis
Tabebuia chrysantha Nicholson
T. rosea DC.
Tectona grandis L.
Terminalia ivorensis A. Chev.
T. myriocarpa Heurck & Muell
T. superba Engl. & Diels

Toona ciliata Roem. var.
australis C. DC.
Trichilia hirta L.
Triplochiton scleroxylon K. Schum.
Tristania conferta R. Br.
Viola spp.
Vitex gigantea H.B.K.

- Notes:**
1. Species names inside parenthesis are the synonyms that were used by BLSF in the past.
 2. "---" = apparently incorrect botanical name. The probable correct name is indicated by*.

ANNEX 2: TERRITORIES CORRESPONDING WITH BLSF

- | | | |
|---------------------------------|---|---------------------------------|
| 1. Angola | 31. Grenada | 61. Papua/New Guinea |
| 2. Argentina | 32. Guam | 62. Paraguay |
| 3. Australia | 33. Guatemala | 63. Peru |
| 4. Bangladesh | 34. Guyana | 64. Philippines |
| 5. Belgium | 35. Haiti | 65. Puerto Rico |
| 6. Belize | 36. Hawaii | 66. Rhodesia |
| 7. Bolivia | 37. Honduras | 67. Rwanda |
| 8. Brazil | 38. Hong Kong | 68. Solomon Islands |
| 9. Brunei | 39. India | 69. Senegal |
| 10. Burma | 40. Indonesia | 70. Sierra Leone |
| 11. Burundi | 41. Israel | 71. South Africa |
| 12. Cameroon | 42. Italy | 72. South Korea |
| 13. Canada | 43. Ivory Coast | 73. Sri Lanka |
| 14. Cayman Islands | 44. Jamaica | 74. Sudan |
| 15. Chile | 45. Kenya | 75. Surinam |
| 16. China | 46. Liberia | 76. Sweden |
| 17. Colombia | 47. Madagascar | 77. Switzerland |
| 18. Costa Rica | 48. Malawi | 78. Taiwan |
| 19. Cuba | 49. Malaysia | 79. Tanzania |
| 20. Denmark | 50. Mauritania | 80. Thailand |
| 21. Dominica | 51. Mexico | 81. Togo |
| 22. Dominican Rep. | 52. Montserrat | 82. Trinidad & Tobago |
| 23. Ecuador | 53. Morocco | 83. Uganda |
| 24. El Salvador | 54. Nepal | 84. United Kingdom |
| 25. Federal Republic of Germany | 55. Netherlands | 85. United States of
America |
| 26. Fiji Islands | 56. Nicaragua | 86. Uruguay |
| 27. France | 57. Nigeria | 87. Venezuela |
| 28. French Guyana | 58. Trust Territory of
Pacific Islands | 88. Virgin Islands |
| 29. Gabon | 59. Pakistan | 89. Zaire |
| 30. Ghana | 60. Panama | 90. Zambia |

ANNEX 3: PRINCIPLE SPECIES THAT WERE DISTRIBUTED BY BLSF

1. Cedrela odorata L.
2. Cordia alliodora (Ruiz & Pavon) Oken
3. Eucalyptus camaldulensis Dehnh.
4. Eucalyptus deglupta Blume
5. Gmelina arborea Roxburgh
6. Pinus caribaea Morelet var. hondurensis B. & G.
7. Pinus oocarpa Schiede
8. Pinus pseudostrobus Lindley
9. Swietenia macrophylla King
10. Terminalia ivorensis A. Chev.