

UNITED STATES GOVERNMENT

Memorandum

PD-AAAQ-482

47
ISN 38676

931.0003

TO : TA/PM - John Gunning

DATE: October 1, 1974

FROM : TA/AGR - Leon F. Hesser

Leon F. Hesser

SUBJECT: Task Order Requesting National Academy of Science (NAS) to do a Feasibility Study of the Winged Bean

The National Academy of Science has carried out a study to identify non-conventional crops around the world that may have substantial potential, with implications for agricultural development and nutrition in LDCs, depending on results of further research and analysis. From among a few hundred possible non-conventional crops suggested in response to a questionnaire, the NAS has narrowed to 40 the number that appear to offer the most promise. Of these 40, the Winged Bean (Psophocarpus tetragonolobus) is high on the list as apparently having a dramatic potential as a food legume.

Only scattered bits of research have been published on the winged bean. Such evidence as there is suggests that the winged bean has many desirable characteristics as a food crop, especially for the wet tropics: the beans, pods, leaves, stalks, and roots are all edible and all have high levels of protein. The total yield of protein per acre surpasses that of nearly any other crop. The nitrogen fixing capacity of the winged bean is also exceedingly high. However, the winged bean is not widely known or grown.

We are asking your approval of \$17,475 through this Task Order to arrange for the NAS to, in effect, do a pre-feasibility study of the winged bean. The Agency has a BOA with NAS, AID/csd-2584. The procedure would be for NAS to host a seminar or workshop. It would include those few scientists from around the world who have the most familiarity with the winged bean, together with a spectrum of non-agricultural scientists to consider the known facts about the winged bean and to outline suggested further research to determine more accurately the qualities of the winged bean, if in the judgment of the group of experts the winged bean does appear to have significant potential as a food crop for the developing countries. The NAS would then put together a publication summarizing the results and conclusions of the seminar and giving suggestions for further research. The publication (three to four thousand copies) would be distributed to research organizations and other interested institutions throughout the world in the hope that this would stimulate expanded research and field trials under sponsorship of other donors and research institutions. It is not expected that A.I.D. would directly finance research on the winged bean.



This particular study was not included in our recent program submission because its significance had not yet been called to our attention. Due to its potentially great impact on the world food problem, particularly as regards protein and nitrogen fixation, we are suggesting that this project be funded from KPA-24 in lieu of one or more studies that were included in our submission.

APPROVED Carl B. Feig

DISAPPROVED _____

DATE 10-2-74

Clearances:

TA/RIG, Dr. Myren *DGM*
TA/PM, C. Molfetto *CM*
TA/PM, M. Mozynski **Mozynski*

cc:

TA/AGR, S. Litzenberger
TA/AGR, D. Plucknett
TA/AGR, G. Baird
TA/OST
TA/N

* It is recommended that this activity be funded under the Special Inputs project as a pre-project activity.

NATIONAL ACADEMY OF SCIENCES

2101 CONSTITUTION AVENUE
WASHINGTON, D. C. 20418

SEP 19 1974

Dr. Joel Bernstein
Assistant Administrator
Bureau for Technical Assistance
Agency for International Development
320 - 21st. Street, N. W.
Washington, D. C. 20523

Bernstein:

The enclosed proposal requesting support for an Academy study panel on the Winged Bean (Psophocarpus tetragonolobus) as a potential new crop plant for the humid tropics is submitted for your consideration as a Task Order under Contract AID/csd-2584. The total estimated funds requested for a 9-month period beginning October 1, 1974 are \$17,475 as shown in the accompanying budget.

The proposed work has been discussed with Dr. Leon Hesser (TA/Agr) and Mr. William Littlewood (TA/OST). Our responsible staff officer is Dr. Noel Vietmeyer of the Board on Science and Technology for International Development. Subsequent contract negotiations are the responsibility of the Business Manager Mr. Bernard L. Kropp. Under separate cover we are sending an additional copy to Dr. Leon Hesser, Acting Director of the Office of Agriculture.

Sincerely yours,

Original signed by
John S. Coleman
Executive Officer

John S. Coleman
Executive Officer

Enclosure

cc: Mr. William Littlewood
Ms. Ruth Flynn
Mr. Bernard L. Kropp
Mr. W. Murray Todd
Dr. Victor Rabinowitch
~~Dr.~~ Donald Plucknett
Dr. Leon Hesser

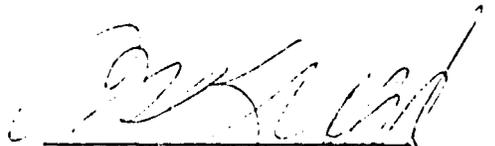
NATIONAL ACADEMY OF SCIENCES
NATIONAL RESEARCH COUNCIL

Office of the Foreign Secretary

A Proposal
to the Agency for International Development
to support the Academy's Study Panel
on The Winged Bean (Psophocarpus tetragonolobus)
as a Potential New Crop Plant for the Humid Tropics

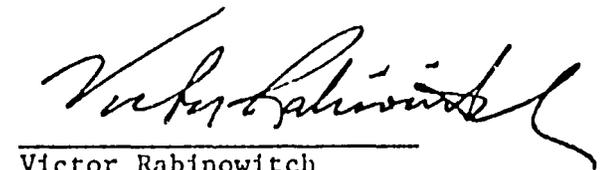
This proposal is submitted by the National Academy
of Sciences which assumes full technical and financial
responsibility under its Act of Incorporation for
the work to be carried out under any contract resulting
from this proposal.

Contract Administration:



Bernard L. Kropp
Business Manager
National Academy of Sciences
Telephone: 202/389-6211

Program Administration;



Victor Rabinowitch
Director, Board on Science
and Technology for Inter-
national Development
National Academy of Sciences
Telephone: 202/389-6521

9 September 1974

NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL

SUMMARY

This proposal to the U.S. Agency for International Development is submitted at the Agency's request, for a task order under Contract AID/csd-2584 to advise the agency with respect to the state of knowledge and future promise of the Winged Bean (Psophocarpus tetragonolobus) as a potential new crop plant for the humid tropics. The Academy through the Board on Science and Technology for International Development will organize an international multidisciplinary expert panel of researchers who have worked with the plant and scientists experienced in nutrition, agronomy, toxicology, and other relevant social, behavioral and economic considerations to produce a brief report on the current state of knowledge and research needed with respect to this plant. The budget of \$17,475, copy attached, covers a 9-month period beginning October 1, 1974.

BACKGROUND

The Agency for International Development, by virtue of its June 1970 contract with the Academy, requested the Board on Science and Technology for International Development to establish an Advisory Committee on Technological Innovation (ACTI) to assist AID in a continuing, systematic search and assessment of developments in selected fields of science and technology that are relevant to the solution of specific problems of developing countries.

In the last few months ACTI published two studies: Food Science in Developing Countries: A Selection of Unsolved Problems and Roofing in Developing Countries: Research for New Technologies. A third report, More Water for Arid Lands: Promising Technologies and Research Opportunities, is at the printers and a fourth, Unexploited Tropical Plants with

Promising Economic Value is in draft and is being reviewed by the panel.

ACTI now proposes to undertake a more detailed study of one of the plants identified in the tropical plants study in view of its exceptional potential as a major source of food.

Psophocarpus tetragonolobus, commonly known as the winged bean or four angled bean because the pod has four flanges along it, is a fast-growing perennial legume that provides protein and micronutrients for humans and animals.

The large number of exceptionally big nitrogen-fixing nodules on its roots confer an unusually high protein content on the seeds, pods, leaves, and roots. They also add nitrogen to the soil and appear to have an excellent effect on the yield of subsequent crops.

The winged bean is particularly promising because, it is adapted to the wet tropics where the incidence of protein deficiency in human diets is greatest and most difficult to remedy. Other legumes, notably soybeans, are scarce in this area because they do not grow well in high temperatures and humidity.

Little is known about the winged bean. It is grown as a backyard crop in New Guinea, Burma, Philippines, and Thailand, but only a few research projects have been conducted on it during the last 10 years. It should be noted that a half century ago the soybean was an equally little known Asian plant. It has now become one of the world's major food crops.

PROPOSAL

The foregoing information is taken from a meager literature. Although the work was done by competent researchers and published in established journals the results have not been subjected to intensive independent research to verify the findings.

To encourage this necessary independent evaluation and to draw the attention of the agricultural research community to the potential of this plant, ACTI proposes to undertake a state-of-the-art review of the plant indicating avenues of research that may enhance prospects for its utilization and impact.

Though the ACTI panel will not be expected to produce a comprehensive report on all aspects of the winged bean the panel will address such matters as:

- ° The state of knowledge of the winged bean
- ° Research needs in nutrition, agronomy, plant genetics, and toxicology
- ° Ecological and socio-economic implications of introducing the plant to new locations
- ° Its likely promise as a crop plant.

It is anticipated that the panel will meet once for several days in the coming months and the report, including recommendations for promising research directions, will be completed, printed, and distributed no later than June 30, 1975.

The report is intended for the attention of international agencies engaged in technical assistance and appropriate officials and institutions

in developing countries concerned with agricultural development and research as well as scientific establishments with relevant interests. It is planned to print 3,000 copies of the report and funds for this purpose are included in the budget.

NATIONAL ACADEMY OF SCIENCES

ACTI Special Studies

STUDY GROUP ON THE WINGED BEAN (Psophocarpus tetragonolobus)

AS A POTENTIAL NEW CROP PLANT FOR THE HUMID TROPICS

1. Travel Expenses		
Domestic	\$1,250	
International	<u>7,500</u>	\$ 8,750
2. Communications and Shipping		500
3. Materials and Services		3,600
4. Indirect Costs		<u>4,625</u>
	TOTAL	<u>\$17,475*</u>

* It is understood that the contract will provide for advance payments.