

IMPROVED MUTANT VARIETIES OF RICE AND BANANA (COS/5/023) D2 New

MODEL PROJECT

CORE FINANCING

YEAR	Experts		Group Activity	Equipment	Fellowships		Scientific Visits		Group Training	Sub-Contracts	Misc. Comp.	TOTAL
	m/d	US \$	US \$	US \$	m/d	US \$	m/d	US \$	US \$	US \$	US \$	US \$
1999	0/15	7,350	0	67,295	1/27	6,555	0/0	0	0	28,000	0	109,200
2000	0/7	3,605	0	73,000	1/0	3,600	0/15	5,700	0	26,000	0	111,905
2001	0/15	8,100	0	31,900	2/0	7,500	0/14	5,600	0	21,500	0	74,600
2002	0/0	0	0	16,750	0/0	0	0/0	0	0	18,500	0	35,250

First Year Approved: 1999

OBJECTIVES: To produce new mutant varieties of rice with resistance to *Pyricularia* and to provide farmers in all five rice producing areas with the new mutant variety "CAMAGO-8". To confirm black sigatoka tolerance of banana clones produced by the Plant Genetics Programme and improve technical management of the clones in order to reduce fungicide use.

BACKGROUND: In the past ten years, rice production in Costa Rica remained low relative to increasing consumption. This negative balance was solved by importing 77,000 tons of rice during 1995. Farmers are vulnerable to changes in economic, agronomic, and climatic conditions. Rice varieties that can increase production could alleviate these problems. A national rice programme has been established in consultation with the rice sector. The main problem in banana and plantain production is black sigatoka, a disease caused by the fungus *Mycosphaerella fijiensis*. The control of black sigatoka is accomplished by repeated fungicide application, which considerably increases the cost of production, environmental damage and occupational health risks. The only way to avoid those problems is to use genotypes resistant to or tolerant of black sigatoka.

PROJECT PLAN: The following activities are foreseen in a collaboration between the Plant Genetics Programme of the National University in Heredia, the National Seed Office, the Board of Rice Seed Producers, the Rice Office, the Ministry of Agriculture and CORBANA (Banana Producers' Corporation): the extension of the rice mutant variety CAMAGO-8 to the North Pacific, Central Pacific, South Pacific, North Atlantic and Caribbean regions; the completion of facilities to sustain and extend the breeding of new rice mutants with resistance to the main diseases and adaptability to different regions and environments, including saline ones; installation of a large plot (2 ha) for the evaluation of agronomic and biological traits of the banana mutants under semi-commercial conditions; technical management of the banana clones by using lowest levels of fungicides and fertilizers to produce best yields.

NATIONAL COMMITMENT: The National University: four permanent staff members; plant tissue culture laboratory; plant molecular genetics laboratory; seed laboratory; analytical services; vehicle for transportation.

National Seed Office: technical personnel for laboratory and field services. Board of Rice Seed Producers: land for extension and demonstration plots; labor for field activities. Rice Office: personnel for seed quality analysis and seed processing; rice grain quality laboratory. Ministry of Agriculture: pathologist, entomologist and technicians for germplasm evaluation; several experimental stations. CORBANA: scientific and technical staff and laboratory provision for micropropagation, field plantation management and field evaluation.

AGENCY INPUT: Expert services in grain quality of rice; equipment, including a plot thresher, an NIZ analyser and data processing equipment; a subcontract for a rice demonstration plot and a banana test plot; a co-ordination meeting and scientific visits in rice antherculture and rice grain quality.

PROJECT IMPACT: This project will build on the achievements of project COS/5/017. Its results for rice and banana will be consolidated. Officially released rice varieties will be multiplied for distribution in the major rice growing area. The coverage of the area in the North Pacific (12,600 ha) with the new variety, for example, should produce an increased benefit of US \$9,996,840 per season due to increased rice production, decreased rice and agrochemical imports, and decreased production costs through less use of fungicides to control *Pyricularia grisea*. The promising mutants in banana with tolerance to black sigatoka will be tested on a large scale under local cultivating conditions to confirm the mutants' superior performance over the local cultivars. It is estimated that the total banana planted areas would finally lead to a cost reduction of US \$58,800,000. In the case of a 50% reduction of spraying, profits would be US \$29,400,000 per year. Reducing fungicide use will also benefit the environment and reduce occupational health risks. Many other banana and rice producing countries facing the same problems will also be able to benefit.