

PN-ABS-685  
C.D.E

REPUBLIC OF CAMEROON  
MINISTRY OF SCIENTIFIC AND  
TECHNICAL RESEARCH  
(MRST)

INSTITUTE OF AGRICULTURAL RESEARCH  
(IRA)

# National Cereals Research and Extension Project

(NCRE)



United States Agency for International Development  
(USAID)

Institute of Agricultural Research  
(IRA)

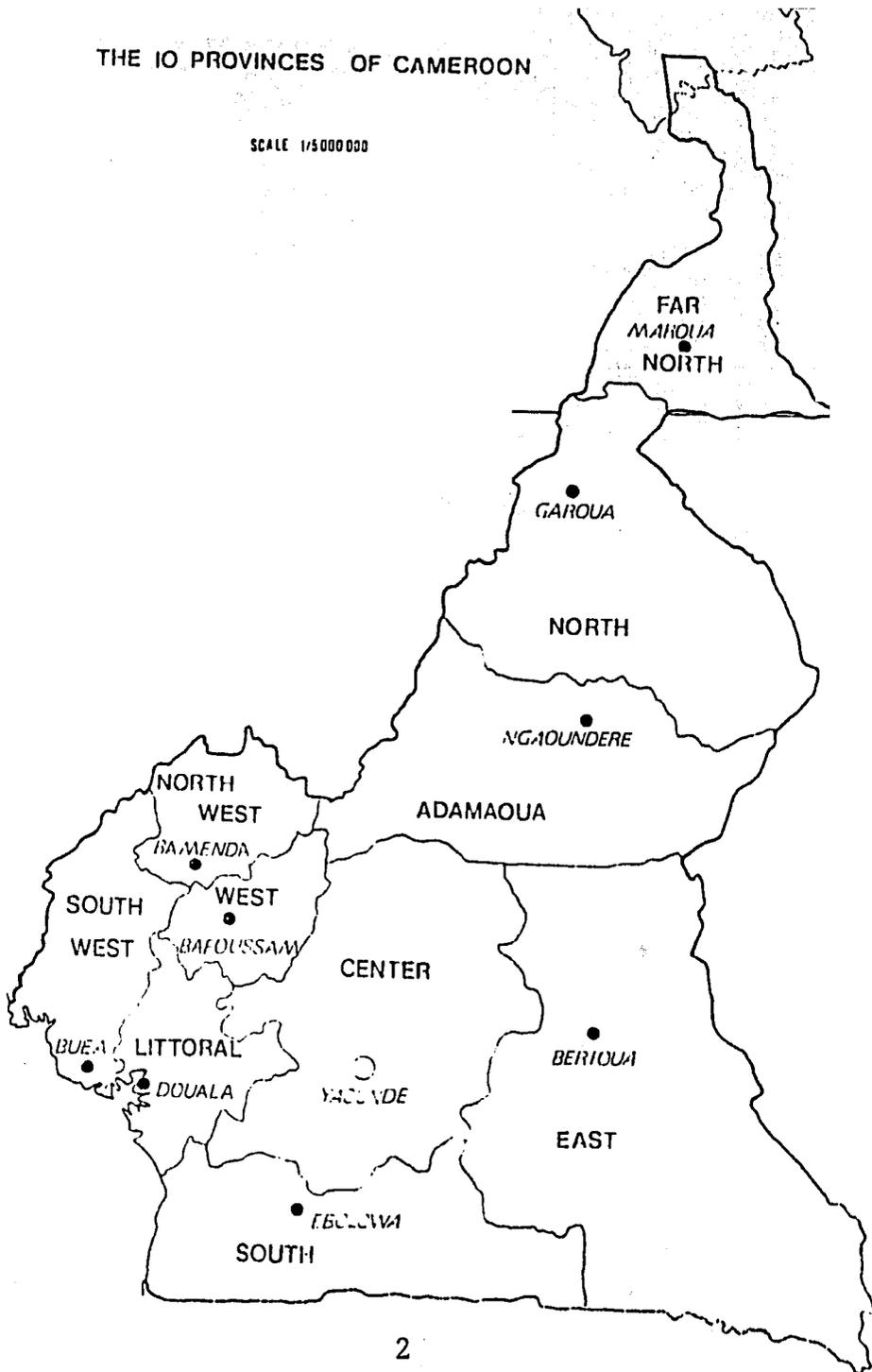
International Institute of Tropical Agriculture  
(IITA)

## **TABLE OF CONTENTS**

<b>The Ten Provinces of Cameroon</b>	<b>2</b>
<b>IRA Infrastructure and NCRE Research Sites</b>	<b>3</b>
<b>Cereal Producing Areas in Cameroon</b>	<b>4</b>
<b>Background</b>	<b>5</b>
<b>The Goal and Purpose of the National Cereals Research &amp; Extension Project</b>	<b>7</b>
<b>Project Components.</b>	<b>8</b>
<b>Research Accomplishments</b>	<b>13</b>
<b>NCRE Degree Training</b>	<b>15</b>
<b>IITA Staff &amp; National Counterparts</b>	<b>17</b>
<b>National Counterparts in Training</b>	<b>18</b>

# THE 10 PROVINCES OF CAMEROON

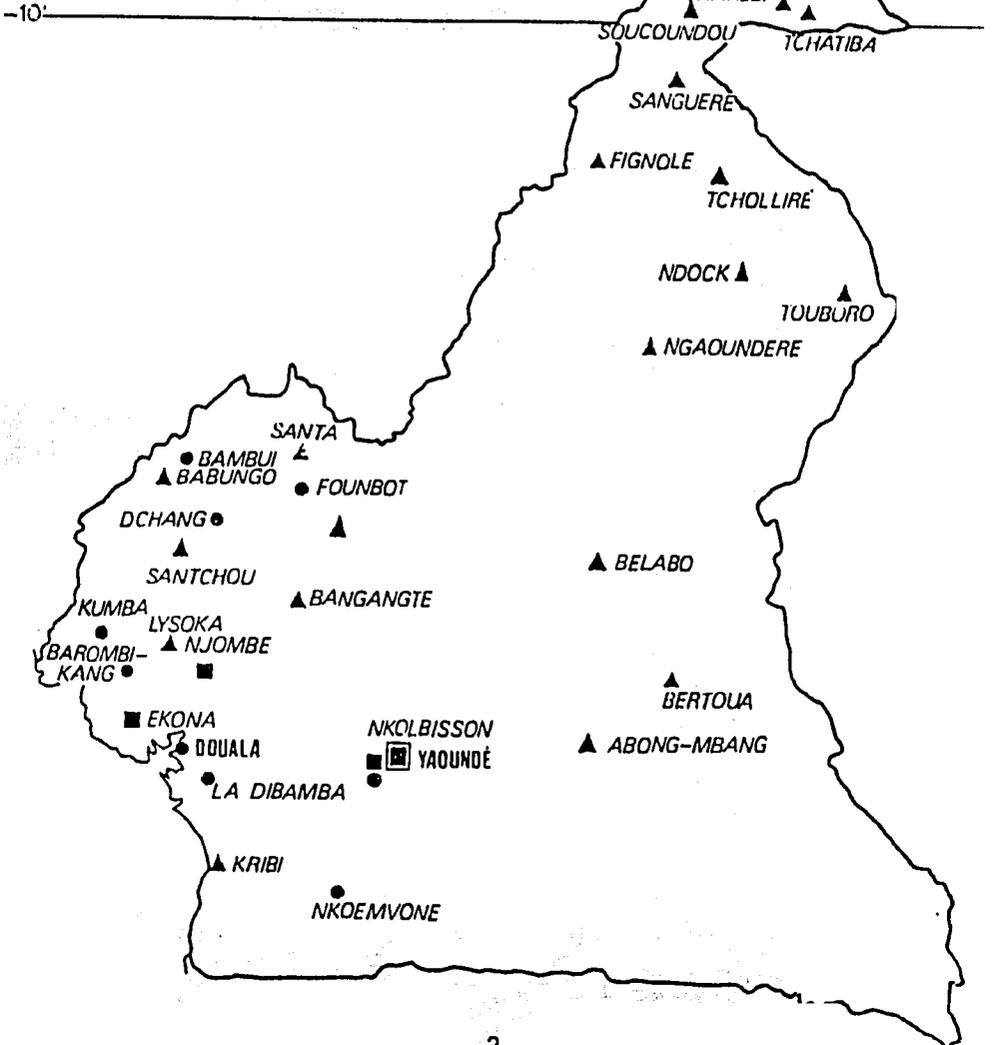
SCALE 1/5 000 000



# IR A INFRASTRUCTURE AND NCRE RESEARCH SITES

SCALE 1/5 000 000

- ▣ DIRECTORATE
- CENTRES
- STATIONS
- ▲ SUBSTATIONS





***THE NATIONAL CEREALS RESEARCH  
& EXTENSION PROJECT  
(NCRE)  
CAMEROON***

**BACKGROUND**

The Republic of Cameroon with an area of 465,458 km<sup>2</sup>, and a population of about 12 million is located in Central Africa stretching over 1,200 km. from Lake Chad in the north (12<sup>o</sup> North) to the Bay of Bonny, Atlantic Ocean in the south (2<sup>o</sup> North).

Cameroon is a land of diverse climates, ranging from humid tropical rain forest in the south to the dry Sahelian climate in the north. Rainfall in the humid tropics can be as high as 5000mm with an average of 250 rain days per year, while in the Sahelian North total rainfall averages about 700mm distributed over a period of three months. In between these extremes lies a succession of diverse climatic zones and different soil structures that affect the agricultural base of the country.

The combination of its vast land, diverse climate, variation in soils and terrain has allowed Cameroon to be self-sufficient in many food crops. Cameroon's agriculture contributes an important share to the national income, employment and foreign exchange savings. Raw petroleum and commercial agricultural crops -- specifically cocoa, coffee and cotton -- are Cameroon's most important exports. In light of falling prices for these commodities, the relative importance of food crops has increased during recent years. Cameroon is fortunate to have comparative advantages, relative to many of its neighbors, in the production of food crops such as cassava, potatoes and vegetables.

Despite its important economic contribution, agriculture in Cameroon is now at a critical stage. According to the National Agricultural Census, per capita agricultural production declined during the 1980s, threatening future food self-sufficiency and the food security the country has enjoyed in the past. Major factors for the falling per capita production are:

- a) declining food crop productivity caused by degradation of agricultural land over the years and the diminishing nutrient value of soils
- b) a relatively high annual population growth rate estimated to be about 3.2 percent
- c) an accelerating urbanization rate (about 10% now) that depends on the shrinking rural food production base
- d) inadequate input supply and market infrastructure.

Because of the important role agriculture plays in the economy of the country, the Government of Cameroon and the United States Agency for International Development (USAID) formally agreed in 1979 to address these production constraints. Under this agreement, with a combined commitment of over \$70 million over 15 years, the **National Cereals Research and Extension (NCRE)** project was conceived. The NCRE Project became operational in 1981 within the framework of the Institute of Agricultural Research (IRA) of the Ministry of Higher Education, Computer Services and Scientific Research (MESIRES). Institutionally, NCRE falls under two of IRA's 16 programs (**Cereals and Farming Systems**). The International Institute of Tropical Agriculture (IITA) headquartered at Ibadan, Nigeria, was contracted to provide technical assistance.

## **THE GOAL AND PURPOSE OF THE NATIONAL CEREALS RESEARCH & EXTENSION PROJECT**

The goal of the NCRE Project is to increase food production and maintain Cameroon's food self-sufficiency and security, through the development of the country's institutional capacity to :

- (a) generate high quality research on cereals (maize, rice, sorghum, millet)
- (b) provide necessary linkages between farmers, extension agents and researchers
- (c) facilitate the transmission of research results to farmers.

To attain the overall goal, the project was divided into two phases with the following specific objectives:

**Phase I (1981-1985):** 1) Develop high yielding varieties and agronomic practices of cereals (maize, rice, sorghum & millet), 2) Develop a program for testing improved packages on farmers' fields, 3) Establish a mechanism to link research, extension and farmers using a two-way communication apparatus, and 4) Provide formal and informal training to both extension agents and IRA/NCRE research staff. Objectives 2 and 3 were assigned to the **Testing and Liaison Units (TLU)** component of the project.

**Phase II (1986-1995):** While maintaining Phase I objectives, the Phase II project agreement added the following objectives to the project: (1) Strengthen and institutionalize the concept of Testing and Liaison Units as integral and on-going components of IRA, (2) Fortify IRA's capacity to conduct research contributing to improved, sustainable crop production systems, with particular attention to soil management, agro-forestry and crop association, and (3) Provide IRA with the capacity to carry out economic analysis relevant to research priorities and agricultural policy research.

## PROJECT COMPONENTS

The project activities are grouped into seven technical components:

1. Maize Improvement and Agronomy
2. Rice Improvement and Agronomy
3. Sorghum & Millet Improvement and Agronomy
4. Testing and Liaison Units (TLUs)
5. Agroforestry and Soil Improvement
6. Economic Analysis
7. Training

### Maize Improvement & Agronomy

This component is divided into two sub programs: **Highland Maize** based in IRA/Bambui (Northwest Province), and **Lowland Maize** based at Nkolbisson (Center Province).

**The Highland Maize Sub-Program:** This sub-program concentrates on target zones in the highlands (elevations of 1000 - 2500 m) of the Northwest and West Provinces, and the Adamaoua Plateau. The two western provinces cover about 10 percent of Cameroon's land area but account for 25 percent of the population, while producing about 60 percent of the national maize crop. The goal of the sub-program is to develop high yielding improved maize varieties adapted to the farming systems of the target zones. The specific objectives of this sub-program are: to: (1) introduce and develop germplasm that are streak resistance and acid tolerant, (2) identify and test open-pollinated and hybrid varieties for TLU testing and validation on farmers' fields, and (3) maintain true-to-type breeder seed of the best varieties and inbreds.

**The Lowland Maize Sub-Program:** This sub-program is responsible for the development of improved maize varieties, suited to elevations less than 1000 m., that are stable, high yielding and acceptable to farmers. Because of the vast area it covers, the lowland maize program focuses its activities on three distinct target areas: The Lowland Humid Forest, the Lowland Moist Savanna, and the Sudano-Savanna Zone. Major constraints found in these agro-ecological zones include: streak virus, acid soil, striga, drought and lowland rust. Specific objectives were formulated to address these constraints, including: (1) identification and development of new germplasm, (2) population improvement, (3) inbred line improvement, and (4) producing and maintaining breeder and foundation seed.

### **Rice Improvement & Agronomy**

The rice research program encompasses rice breeding and agronomic activities at Dschang (West Province), Garoua (North) and Maroua (Extreme North). The primary goal of the rice program is to develop stable and high yielding new/improved rice varieties with better resistance to major stress (blast, cold, acid soil, blight, lodging, bird damage, etc.). Maintaining pure stocks of recommended and promising germplasm is also a high priority.

Specific objectives of the rice program are: (1) hybridization of varieties to overcome deficiencies of existing varieties, (2) assess yield potential and test adaptability at different locations, (3) develop and maintain genetic purity and breeder's seed of elite lines, and (4) evaluate varietal yield performance as affected by production practices.

## **Sorghum & Millet Improvement and Agronomy**

This component of the NCRE Project is responsible for research on sorghum and millet in the three provinces of northern Cameroon. The major goal of this program is to increase sorghum and millet production through the development of improved high yielding cultivars resistant to various pests and diseases. Some of the major constraints are: striga, mold, bird damage, lodging and drought. Responding to these constraints, specific objectives were established to: (1) Develop suitable high yielding cultivars of sorghum for release to different ecological zones, (2) Develop varieties resistant to striga, (3) Maintain, test and evaluate hybrid parents, (4) Collect, maintain and evaluate Muskwari (dry season sorghum) germplasm, (5) Develop stable and high yielding pearl millet cultivars, and (6) Improve agronomic practices including moisture conservation.

### **The Testing and Liaison Units (TLUs)**

The TLUs are the farming systems research (FSR) component of the NCRE Project, and institutionally fall under IRA's Farming Systems Program. The main functions of the TLUs are: farming systems diagnosis, on-farm testing and validation, and extension liaison activities. The first TLU was established during Phase I at IRA/Bambui in the Northwest Province.

The Bambui site was selected because maize research at the IRA station there was highly advanced, with at least one variety ready to transmit to farmers. The TLU's major thrusts then were to: (a) Facilitate communication between research and extension by organizing seminars for Ministry of Agriculture extension personnel, (b) Validate station-developed technologies on farmers' fields (mini-kits), (c) Demonstrate proven technologies, and (d) Provide feedback of crop production problems to research station scientists.

The Bambui TLU was a success. Following a positive evaluation by external reviewers, three additional TLUs were created, since 1986, to extend coverage to three distinct agro-ecological zones: Sudano-Sahelian at Maroua; high rainfall humid forest at Ekona, and sub-humid forest at Nkolbisson.

Since the expansion of the system, the individual TLUs have broadened their scope to include non-cereal food crops in their respective farming systems research. Emphasis has also shifted to development of low input, yield increasing technologies that conserve precious resources. Each TLU is staffed with a Systems Agronomist and Agricultural Economist who work closely with scientists from other disciplines.

### **Agroforestry and Soil Improvement**

The program's agroforestry and soil improvement research focuses on the highlands of the Northwest and West provinces. Population pressure in the provinces is intense, leading to widespread hillside cultivation and subsequent erosion of fertile top soil. The overall goal of this program is to restore fertility to impoverished farmlands and maintain the fertility of productive soils using agroforestry and related fallow techniques. The specific program objectives are to: (1) Undertake soil analysis to establish the basis for future fertility management trials, (2) Identify suitable herbaceous legume species for use as green manure and cover crops for different agro-ecological zones, (3) Assess the potential and management requirements of woody species for soil improvement and conservation, and (4) Gather information documenting functional agroforestry and improved fallow systems applicable to various agro-ecological zones.

The highland program complements IRA/ICRAF's lowland agroforestry research program in the sub-humid forest zone of South and Center Provinces.

## **Economic Analysis**

The Economic Analysis program was created at the beginning of Contract III (1991-95) to provide IRA with a capacity for economic analysis relevant to its research and development mandate. The aim of the program is to increase IRA's research efficiency, productivity and impact by carrying out economic studies for institute level priority setting, program planning and measuring research benefits.

## **Training**

Training, an essential element of the project, overlaps with all its other components. Formal and informal training takes many forms: on-site; discipline-oriented short courses; short-term training (in and outside Cameroon); in-service training, and long-term degree training. Upon returning from degree training, Cameroonian counterparts work with the NCRE Technical Assistants for at least one year to prepare them for taking over of responsibilities. The project also provides periodic refresher courses and practical training to extension agents working in project mandated areas.

## RESEARCH ACCOMPLISHMENTS

### **BREEDING: Varieties Developed/Introduced, and Released by NCRE**

---

Variety	Yr. Released	Region	Type
---------	--------------	--------	------

---

### **. M A I Z E .**

#### Lowland:

CMS 8501	1987	North, SE	Late, white, dent/flint
CMS 8503	1987	Center, North	Medium, white, dent
CMS 8507	1987	North, NW	Late, white, dent
CMS 8602	1988	North	Early, yellow, flint
CMS 8704	1989	Center, North	Late, yellow, flint
CMS 8710	1989	North	Late, white, dent/flint
NDOC 8701	1989	Center, North	Late, white, dent/flint
CMS 8806	1990	Center, North	Early, yellow

#### Highland:

SHABA	1986	Adamaoua	Late, white
KASAI-SR	1985	West, NW	Short, Med. white, d/flint
COCA-SR *	1990	West, NW	Late, white, dent
HAP	1990	West, NW	Late, mixed
ATP	1990	West, NW	Late, yellow, dent/flinty
SYNTHETIC	1990	West, NW	Late, white

Variety	Yr.Released	Region	Type
---------	-------------	--------	------

..... R I C E .....

IR 7167	1986	NW (Ndop), W (Mbo)	
CICA 8	1984	West Mbo	
BKN 7033	1987	North, Lagdo	
IRAT 10	1984	West, Mbo	

..... S O R G H U M .....

S-35	1985	Extreme North	Early, white
S-34	1986	North	Medium, white
CS-54	1988	Extreme North	Early, white
SC-95	1988	North	Medium, white
CS-61	1988	North	Medium, white

\* Variety developed by IRA, later improved by NCRE with the addition of streak resistance (SR) to it.

## NCRE DEGREE TRAINING (1984-91)

DISCIPLINE	DEGREE	No. OF TRAINEES
Agronomy	Ph.D	2
Soil Science	Ph.D	1
Maize Breeding	Ph.D	1
Agricultural Economics	Ph.D	1
Agronomy	M.Sc.	7
Maize Breeding	M.Sc.	3
Rice Breeding	M.Sc.	2
Sorghum Breeding	M.Sc.	2
Cereals Entomology	M.Sc.	1
Cereals Pathology	M.Sc.	1
Maize Pathology	M.Sc.	1
Soil Science	M.Sc.	1
Agricultural Economics	M.Sc.	1
Agronomy	B.Sc.	<u>3</u>
	<b>Sub-total</b>	<b>27</b>

**--IN TRAINING (1992-94)-**

Agronomy	Ph.D	1
Ag. Economics	Ph.D	1
Ag. Education/Extension	Ph.D	1
Maize Breeding	Ph.D	1
Cereals Pathology	Ph.D	1
Agronomy	M.Sc.	5
Ag. Economics	M.Sc.	4
Sorghum Breeding	M.Sc.	2
Plant Breeding	M.Sc.	<u>1</u>
	<b>Sub-total</b>	<b>17</b>
	Ph.D	10
	M.Sc.	31
	B.Sc.	3
	<b>Total</b>	<b>44</b>

## IITA Staff and National Counterparts

### IITA STAFF

Name	Nationality	Position	Location
Dr. Emmanuel A. Atayi	Togolese	Chief of Party	Nkolbisson
Dr. Thomas Stilwell	American	Deputy Chief of Party	Nkolbisson
Mr. Greg Servant	American	Administrative Officer	Nkolbisson
Dr. M. Moussie	Ethiopian	Agricultural Economist	Nkolbisson
Dr. John Poku	Ghanian	Systems Agronomist	Nkolbisson
Dr. Doyle Baker	American	Agricultural Economist	Nkolbisson
Dr. Noel Beninati	American	Maize Breeder	Bambui
Mr. Dermot McHugh	American	Agricultural Economist	Bambui
Dr. Olumuyiwa Osiname	Nigerian	Systems Agronomist	Bambui
Dr. Charles Yamoah	Ghanian	Soil/Agroforestry	Bambui
Dr. Humphrey Ezumah	Nigerian	Systems Agronomist	Ekona
Dr. Henri Talleyrand	American	Cereals Agronomist	Garoua
Dr. Robert Carsky	American	Systems Agronomist	Maroua
Dr. Jean Detongnon	Beninois	Grain Legumes Specialist	Maroua
Dr. Mulumba Kamuanga	Zairois	Agricultural Economist	Maroua

### IRA-NCRE Scientist-Counterparts

Name	Title	Unit
*Dr. Jacob Ayuk-Takem	Maize Breeder NCRE Natl. Coordinator Minister MRST/Director of IRA	IRA-Nkolbisson
Mr. Michel Ndoumbe	Extension Agronomist	TLU-Nkolbisson
Mr. Kaho Francois	Extension Agronomist	TLU-Nkolbisson
Mr. Augustin Fouaguegue	Agricultural Economist	TLU-Nkolbisson
*Dr. Pauline Zekeng	Extension Agronomist	TLU-Nkolbisson
*Dr. Charles Thé	Maize Breeder	Maize Breeding-Nkolbisson
*Mr. Celicard Zonkeng	Maize Breeder	Maize Breeding-Nkolbisson
*Mr. Jean-Boseo Zangue	Maize Breeder	Maize Breeding-Nkolbisson
Mr. Roger Nkoa	Maize Breeder	Maize Breeding-Nkolbisson
Mrs. Regine Aroga	Entomologist	Entomology-Nkolbisson

Miss Ndemah Rose	Entomologist	Entomology-Nkolbisson
*Dr. Edward Ngong-Nassah	Extension Agronomist	IRA Foubot
Mr. Francois Meppe	Extension Agronomist	TLU-Bambui
Mr. Jean Enam	Agricultural Economist	TLU-Bambui
*Mr. Marc Samatana	Agricultural Economist	TLU-Bambui
Mr. Christopher Ngong	Agronomist	Agroforestry-Bambui
*Mr. Martin Nguegum	Agronomist	Agroforestry-Bambui
Dr. Pierre Tchamo	Maize Breeder	Maize Breeding-Bambui
Mr. Isidore Tabi	Maize Breeder	Maize Breeding-Bambui
*Mr. Zachee Ngoko	Plant Pathologist	Plant Pathology-Bambui
*Mr. Pascal Ngninbeyie	Rice Breeder	Rice Program-Dschang
*Mr. Cletus Asanga	Entomologist	Entomology-Dschang
*Dr. Manfred Besong	Agricultural Economist	TLU-Ekona
*Mrs Christine Poubom	Extension Agronomist	TLU-Ekona
Mr. Mboussi A. Messia	Extension Agronomist	TLU-Ekona
Mr. Martin Fobasso	Extension Agronomist	TLU-Maroua
Mr. Endondo Chevalier	Legume Agronomist	Grain Legumes-Maroua
Mr. Fokou Joseph	Rice Agronomist	Rice Program-Maroua
*Mr. Richard Kenga	Sorghum Breeder	Sorghum Breeding-Maroua
Mr. Jacques Beyo	Sorghum Breeder/Entomol.	Sorghum Breeding-Maroua
*Mr. Andre Djonnewa	Sorghum Breeder	Sorghum Breeding-Maroua
Mr. Blaise Mongimong	Maize Breeder	Maize Breeding-Garoua
*Dr. Julius Takow	Soil Scientist/Rice Agron.	Rice Program-Garoua

\* Indicates degree received through NCRE

### National Counterparts in Training

Name	Specialization	Unit/University
Mrs. L.A. Enyong	PhD Agricultural Education	TLU-Nkolbisson/Virginia Poly
Mr. Georges Dimithe	MSe Agricultural Economics	TLU-Nkolbisson/Michigan State
Miss Mankolo Regine	MSe Agronomy	TLU-Nkolbisson/Virginia Poly
Mr. Pierre Bountje I.	MSe Agricultural Economics	TLU-Nkolbisson/Univ. Illinois
Mr. Blaise Aubin Nguingbo	MSe Agronomy	TLU-Nkolbisson/Univ. Illinois
Mr. Mbassa Ndioro	MSe Maize Breeding	Maize Breeding-Bambui/U. Minn.
Mr. Claude Nankam	PhD Plant Pathology	Plant Pathology-Bambui/U. Illinois
Mr. Birang a Madong	MSe Agronomy	Rice Program-Dschang/Univ. Ark
Mr. Fabien Jeutong	PhD Sorghum Breeding	Sorghum Program-Maroua/U. Neb
Mrs. Comfort Ateli	MSe Agronomy	TLU-Ekona/Wisconsin State Univ.
Mr. Ranava Ndikawa	MSe Agronomy	TLU-Maroua/Ahmedo Bello Univ.
Mr. Charles Njomaha	MSe Agricultural Economics	TLU-Maroua/Oklahoma State.
Mr. Titus Ngoumou	PhD Agronomy	Cereals Agron.- Garoua/Cornell
Mr. Anatole Ebete	MSe Agronomy	Cereals Agron.-Garoua/Miss.