



CIEPCA NEWSLETTER

NUMBER 1

FEBRUARY 1998

The contribution of cover crops to the sustainability of agriculture is becoming increasingly evident in many regions of the world. Scientists and development agents are striving to integrate cover crops in agricultural production systems in many countries in tropical regions. However:

“mimicking the role of the forest by using short and early maturing species which are biologically very different from trees, entails several problems. The selection of the cover crop should be based on many complex variables: its nature, potential adaptation to the environment, reactions vis-à-vis pests and predators, effects in a given climate on the soil; the nature of the main crop and the potential use of the cover crop as fodder.” *G. Mangenot (prefacing Henri Botton, 1958: Les plantes de couverture : guide pratique de reconnaissance et d'utilisation des Légumineuses en Côte d'Ivoire)*

This concern of Mangenot in 1958 is also our concern thirty years later. We hope that CIEPCA¹, the Center for Cover Crops Information and Seed Exchange in Africa will play a role in helping researchers in Africa to develop appropriate cover cropping systems.

This inaugural issue of the CIEPCA newsletter introduces CIEPCA and briefly describes some work carried out on cover cropping in Africa. It also gives additional sources of information on cover crops. We hope that future issues will carry more information including input from readers.

CIEPCA : historical background

At the initiative of the International Development Research Center (IDRC), a regional workshop, organized by Sasakawa Global 2000 (SG 2000), the International Institute of Tropical Agriculture (IITA), and the Ministry of Rural Development of

Benin, and entitled “*Cover Crops and Green Manure in Sustainable Agriculture in West Africa: Constraints and Opportunities*” was held in Cotonou, Republic of Benin, from 1 to 3 October 1997. The workshop, funded by IDRC and SG 2000, was attended by 50 researchers and development agents from 10 African countries and elsewhere. During this workshop, participants identified the lack of information on cover crops and the lack of seeds as two major bottlenecks to the development and adoption of cover crops in African production systems.

Therefore, the participants recommended the creation of a nonbureaucratic body that would facilitate information and seed exchange between West African countries. This led to the inception of CIEPCA, which will publish biannually, a newsletter to disseminate information on many aspects of cover crops.

CIEPCA objectives

CIEPCA aims to facilitate information flow on research, development and seed availability of cover crops in sub-Saharan Africa. The specific objectives are:

- i. Collect all available information on cover crops research and development in Africa and elsewhere in the tropics. Translate (English/French/English) and disseminate detailed information where necessary to immediate beneficiaries (researchers and extensionists developing and testing cover crops systems). Document efforts toward adoption and actual cases of adoption of cover crops systems in Africa.
- ii. Facilitate information exchange on cover crops within and between countries in Africa and elsewhere. The media of exchange are print (i.e., newsletter) and electronic (diskette, e-mail, internet). E-mail connectivity of country contact persons will be improved. The newsletter will carry abstract of reports, information on current research and development activities, and sources of additional information. Electronic information will be similar to print except that more detail

¹ Centre d'Information et d'Echanges sur les Plantes de Couverture en Afrique

will be made available as databases (legumes, cover crops researchers, etc.) and full reports.

- iii. Multiplication and distribution of seeds of cover crops to researchers and extensionists in Africa with particular emphasis on the following countries: Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Ghana, Mali, Nigeria, Senegal, and Togo. Linkage to IITA for support on characterization, germplasm storage and phytosanitary guidelines.
- iv. Stimulate research on strategic issues influencing the utilization of cover crops in the region by funding adoption/impact studies, reviewing available literature, and searching for additional donor support.

CIEPCA Contact persons

Contact persons representing the countries that participated in the Cotonou workshop were appointed in order to facilitate the distribution of cover crops seeds (using proper phytosanitary precautions) and the dissemination of information. They are:

For West Africa

Benin: Albert Etèka
 Burkina Faso: Zacharie Segda
 Cameroon: Alphonse Youri
 Côte d'Ivoire: Mathias Becker
 Ghana: Paterson Osei-Bonsu
 Mali: M'Piè Bengaly and Elie Dembélé
 Senegal: Fatou Gueye
 Togo: Ambroise Fantchede

Other regions

France: Pascal Marnotte
 Zambia: Freddie Kwesiga

(Full addresses via the CIEPCA Coordinator)

More contact persons may be appointed later in order to facilitate information exchange and seed distribution in these countries or others.

CIEPCA Steering Committee

The CIEPCA Steering Committee is composed of a group of people who can be easily contacted by the coordinator, either by telephone or by e-mail. They are as follows:

K. Aïhou, INRAB, Niaouli
 M. Galiba, SG2000-Cotonou,
 S.A. Tarawali, IITA/ILRI, Ibadan,
 R.J. Carsky, IITA, Cotonou
 A.C. Etèka, IITA, Cotonou

(Full addresses via the CIEPCA Coordinator)

The Steering Committee members assist the coordinator in decision making mostly by e-mail, but also by periodic meetings if necessary.

CIEPCA Coordinator

Mr Albert C. Etèka, a Beninese holds a graduate degree from the Faculty of Agricultural Sciences of the National University of Benin. From February 1989 to December 1996, he worked with the Technology Transfer Unit (TTU), IITA-Benin. TTU's mandate was to liaise between the national agricultural research systems (NARS) of Benin, Togo, Niger and Chad and IITA, particularly IITA-Ibadan. Since January 1997 as coordinator of CIEPCA, Mr Etèka works with IITA's Resource and Crop Management Division (RCMD) which focuses on the development of sustainable farming systems.

Activities of cover crops workshop participants

During the workshop on cover crops in October 1996, some participants specified activities they would carry out in relation to cover crops and green manure. These are reproduced below for your information.

Benin

Adelabou Jérémie

- Assess the impact of *Mucuna* on maize in the Atacora department.
- Jointly organize with the Training Service, an information and training workshop on cover crops and their benefit in livestock-crop integration.
- Propose a preextension theme on sole *Mucuna* cropping for one year in an improved fallow.
- Request the R&D unit in the Atacora department to conduct tests on (i) *Mucuna*/cereal rotation for *Striga* control and (ii) trials on the use of woody legume hedgerows for *Mucuna* plots.

Agossou Valérien

- Identify short-duration varieties of *Mucuna* for the far northern region of Benin.
- Conduct trials on the efficiency of fences in protecting improved fallows planted with *Mucuna*.
- Propose alternative management practices: study farmers' perception on burying *Mucuna* at the end of the rainy season (end of cycle tillage) in the absence of fencing.

Aïhou Kouessi

- Conduct quantitative and qualitative evaluation of selected varieties of *Mucuna* sp. in the Niaouli collection.
- Study the effect of cover plant x amendment x manure interaction on maize yield.
- Study the effect of the following rotations: maize/*Mucuna* sp., maize/*Canavalia*, maize/egusi, *Canavalia*/*Tephrosia*, and maize/cassava on soil and crop productivity.

Amadji Firmin

- Inspect diseased or attacked *Mucuna* plants to identify the vectors (in collaboration with IITA).
- Study the evolution of organic matter in tillage (Ouémé) and non-tillage cropping systems (Mono) in collaboration with CENAP².
- Conduct trials on the use of *Mucuna* in weed control, e.g., *Imperata*.

Amidou Moutaharou

- Determine the chemical fertilizer formula on maize after one, two, and three years of fallow planted with *Canavalia ensiformis* and *Aeschynomene histrix*.

Dagbenonbakin Gustave

- Introduce short-duration *Mucuna* in Benin for trials in the northern region
- Use selected legumes in the biodegradation of natural phosphate and limestone in Onigbolo

- Monitor the pH levels in the plots of farmers who adopted *Mucuna*
- Conduct legume-based intercropping for soil fertility restoration.

Gokou Gérard

- Plant cover crop varieties in the coastal region to eradicate *Imperata cylindrica*

Houngnandan Pascal

- Study the symbiotic properties for a better establishment of *Mucuna* in the production systems in various soil types in Benin.
- Study various processes in the dynamics of *Mucuna* organic matter
- Assess the efficiency of organic and inorganic nitrogen utilization in relay cropping with cover crops (*Mucuna*).

Vissoh Pierre and Fantchede Ambroise (Benin/Togo)

- Assess the impact of *Mucuna* on *Striga* in northern Benin and Togo.

Yaï Kegnidé

- Assess the usefulness of the *Mucuna pruriens* var. *utilis* seed project in order to meet the needs of pastoralists and agropastoralists in the area.
- Propose thorny hedgerow tree species for use as fence for fodder plots.

Burkina Faso

Nonguierma Edouard

- Promote the use of *Mucuna* for the recovery of soils under intercropping in reforested areas not currently exploitable and for the regeneration of soils under heavy degradation.
- Integrate *Lablab* into the soil to enhance soil fertility.

Segda Zacharie

- Introduce *Mucuna pruriens*, *Canavalia ensiformis*, *Centrosema pubescens*, and *Calopogonium mucunoides* on farm.

Zougmore Robert

- Conduct varietal trials on *Mucuna* and creeping *Canavalia* whose cycles are adapted to the duration of the rainy season in dry areas.

Cameroon

Mbarga Célestin

- Integrate *Mucuna* into the sedentary production system to enhance the productivity of the environment.

Youri Alphonse

- Use *Mucuna* as a cover crop to control *Comelina* sp. in northern Cameroon
- Use *Lablab* as a cover crop, fodder, and to enhance milk production.

² Centre National d'Agro-Pédologie

Côte d'IvoireBecker Mathias

- Conduct research on legume crops intercropping.

GhanaDogbe Wilson

- Conduct maize-*Mucuna* rotation trials
- Conduct alley cropping trials using *Cajanus cajan*, *Leuceana*, and *Glyricidia* as hedgerows mixed with *Mucuna* and *Dolichos lablab*;
- Conduct strip cropping trials using pigeon peas, *Leuceana*, and *Glyricidia* with cereal crops mixed with *Mucuna* and *Dolichos*;
- Conduct legume crop intercropping trials (*Mucuna-Canavalia*, *Mucuna-Pueraria*, *Mucuna-Dolichos*, *Calopogonium-Stylosanthes* followed by *Stylosanthes-Mucuna*).

Fianu Franck

- Assess the effect of nutritional levels of *Mucuna* fodder on the performance of ruminants
- Assess the effect of nutritional levels of *Mucuna* grain flour on the performance of pigs and poultry

MaliBengaly M'Piè

- Identify *Mucuna* varieties that are adapted to semiarid zones (800–1000 mm) during a 4- to 5-month vegetative period and that can be mixed with cereal crops.

Dembele Elie

- Conduct large-scale dissemination of workshop results, notably opportunities, experiences of other countries in terms of cover crop performances vis-à-vis soil fertility, significant reduction of weeds, and fodder production.
- Sensitize production units to the need for an appropriate incorporation of cover crops during the forthcoming cropping season.
- Provide the CIEPCA coordinator with all the extension technical forms (used by CMDT).

Zoumana Kouyaté

- Formulate *Lablab* and *Sesbania rostrata*-based recipes for human consumption.

SenegalFatou Gueye

- Introduce short-duration *Mucuna* varieties to selected pilot farmers in the Niayes zone in order to enhance soil fertility
- Assess the varietal performance of short-duration legume cover crops and green manure on station
- Assess the effect of *Mucuna* on irrigated soils infested by nematodes in the research station of the "Centre pour le Développement de l'Horticulture de Cambérène" in Dakar.

Seydou Diémé

- Conduct performance trial on *Dolichos lablab*, *Canavalia ensiformis*, and any other short-duration varieties.

Sock Issa

- Introduce *Mucuna* to small-scale irrigated schemes in the Northern part of Senegal
- Assess on-farm adaptability of *Mucuna* as manure in irrigated rice production and conduct performance trials

ZambiaKwesiga Freddie

- Assess *Mucuna* performance in subhumid zones in Zambia.

If you are interested in any of these activities, please contact the CIEPCA Coordinator for the address of the contact persons.

ABSTRACTS OF REPORTS RELATED TO COVER CROPS

GEPRENAF's work on yam-based systems

Recently, the GEPRENAF³ (Participatory Management of Natural Resources and Fauna) project requested a World Bank team to conduct a study on the stabilization of yam-based systems. This study was conducted in the northern part of Côte d'Ivoire and the south of Burkina Faso which are major yam-producing areas. The study concluded that soil fertility is a constraint to yam production. Based on their observations and discussions with farmers, extension workers, and scientists from many West African countries, the Review Team indicated that the introduction of *Mucuna* and *Pueraria* into the rotation scheme seems to be the best method of improving the yam-based system in the future.

For further information, please contact Lassa Traoré, Coordinator, GEPRENAF, Banfora (Burkina Faso) or Fanny N'Golo, Coordinator, GEPRENAF (Côte d'Ivoire), Tel: 225-21-07-00, Abidjan

Chromolaena odorata : Weed or cover crop?

Following a study conducted in the Gagnoa (Côte d'Ivoire) forest zone, P. Aufray and H. Gbaka Tchetché reported that *Chromolaena odorata* (Asteraceae) could be used as a cover crop, has a very high mineral content, and that the nitrogen content of its leaves is close to that of fodder legume crops. Their analyses revealed that 2 t/ha of *C. odorata* leaf dry matter provides 60 kg/ha of nitrogen, 5 kg/ha of phosphorous, 46 kg/ha of potassium, and 43 kg/ha of calcium. They suggested the need to relativize biological control programs of this weed. Indeed, they suggest the use of *C. odorata* as mulch (in association with the application of herbicide containing 2,4-D) as a simple alternative to shifting cultivation. However, they suggested improvements in these management practices, given that weed proliferation is the major constraint to the establishment of agricultural activities in humid zones.

For further information please contact P. Aufray: CIRAD-CA, B.P. 1465, Bouaké 01, Côte d'Ivoire or H. Gbaka Tchetché: IDESSA, B.P. 633, Bouaké 01, Côte d'Ivoire.

Canavalia ensiformis for animal feed and human consumption

Farmers in northern Thailand use *C. ensiformis* to control *Imperata cylindrica* and its immature pods for human consumption. People in the Huai Hom community (northern Thailand) are fond of young pods of *C. ensiformis*. Mature pods are poisonous (unless they are well cooked; they must be boiled

in water which should be changed a number of times during the cooking.

For further information, please contact Laura Johnson
3907 Crestview Rd. S. W. Calgary, Alberta, Canada T2T-2L5
Tel/fax: (403) 243-2452 E-mail: <RD-JOHSON@msn.com>

OTHER INFORMATION SOURCES ON COVER CROPS

CIDICCO

CIDICCO, "Centro Internacional de Información sobre Cultivos de Cobertura," is commonly called the International Cover Crops Clearinghouse. It is based in Honduras (Central America) and was founded some 10 years ago. CIDICCO has published many issues of a newsletter entitled Cover Crops News, technical reports, and various other reports. Most of these documents are published in Spanish; some are translated into English. Emphasis is on *Mucuna*, *Canavalia*, *Dolichos*, *Phaseolus coccineus*, *Vigna* sp., *Phaseolus vulgaris*, and (recently) *Arachis pintoii* for Central America (which is relatively more humid than West Africa in general). You may contact CIDICCO, at the following addresses: CIDICCO, Apartado Postal 4443, Tegucigalpa MDC, Honduras. E-mail: <cidicco@gbm.hn>.

ECHO

ECHO is a Christian nongovernmental organization based in Florida (USA). ECHO members are involved in the multiplication of a wide range of plants of agricultural interest including certain cover crops. They dispatch small quantities of seeds for testing and multiplication. They publish (in English) a newsletter called ECHO Development Notes (EDN). EDN is also published in Spanish. It covers various topics including cover crops. For example, EDN No. 43, December 1993, reported that "*Mucuna pruriens* is successful in the Republic of Benin" and mentioned that "*Mucuna pruriens* might have had more impact on farmers' life than any other crop released from their seed bank." This NGO can be contacted at the following address: ECHO, 17430 Durrance Road, North Fort Myers, FL 33917-2200, USA. E-mail: <echo@xc.org>.

MULCH-L

MULCH-L is a listserver, or electronic bulletin board set up to exchange interdisciplinary information on cover crops, green manure, and other mulch-based agricultural systems using herbaceous or nonherbaceous species. It is managed by the CIIFAD-MOIST Programme of Cornell University, USA. Communication is in English. To subscribe to MULCH-L, please send an e-mail message to <listproc@cornell.edu> with the phrase "subscribe MULCH-L," followed by your name. For further information, please contact L. Fisher at: <lhf2@cornell.edu>.

³Gestion participative des ressources naturelles et de la faune

PROGRESS IN CIEPCA

Legume cover crop species available at CIEPCA

The following legume cover crops species are available at CIEPCA in limited quantities. Please send your requests to the CIEPCA coordinator and include information on your target zone and cropping system.

Aeschynomene histrix
Calopogonium mucunoides
Canavalia ensiformis
Canavalia rosea
Cassia occidentalis
Cassia tora
Centrosema pubescens
Crotalaria ochroleuca
Crotalaria naragutensis
Crotalaria retusa
Dolichos argenteum
Flemingia macrophylla
Lablab purpureus
Mucuna cochinchinensis
Mucuna deeringiana
Mucuna spp. var Georgia
Mucuna spp. var Ghana
Mucuna jaspadea
Mucuna spp. var Preta
Mucuna spp. var Rajada
Mucuna utilis
Mucuna spp. var Vera Cruz (white)
Mucuna spp. var Vera Cruz (black)
Mucuna spp. var Vera Cruz (striped)
Phaseolus lunatus
Psophocarpus palustris
Psophocarpus tetragonolobus
Pueraria javanica
Sesbania rostrata
Tephrosia candida
Vigna umbrellata

Seeds multiplied at CIEPCA in 1997

In collaboration with colleagues from the Ministry of Rural Development of Benin, CIEPCA conducted seed multiplication of some cover crop species in 1997. The following table includes the species and land area involved.

Species	Area (ha)
<i>Mucuna spp.</i> var Rajada ⁴	5.5
<i>Mucuna spp.</i> var Preta	7
<i>Mucuna utilis</i>	3
<i>Mucuna cochinchinensis</i>	0.25
<i>Canavalia ensiformis</i> ⁵	1
<i>Aeschynomene histrix</i>	1
Total	17.75

⁴ An early maturing variety

⁵ The erect type is being multiplied

When the multiplication plots were visited in October 97, collaborators were setting up firebreaks around these plots. Indeed, in the West African subregion, bush fires are a calamity for crops such as *Mucuna* in particular. *Mucuna spp.* var Rajada was already producing pods while *M. utilis* was yet to flower. If this operation goes smoothly, about five tonnes of *M. spp.* var Rajada is expected in 1998.

LEXSYS 2.1

LEXSYS is a database of herbaceous legumes (90 data fields) and software which makes it possible to search the database using 45 selection criteria. The legume crops are classified on the basis of ecological adaptability, cropping systems niche (characteristics which influence the integration into the cropping system), contributions to the production systems, and pest problems. Each procedure identifies a list of legumes which meet the selection criteria. The references used to set up the database can also be accessed. LEXSYS runs on a personal computer with DOS.

Both the LEXSYS 2.1 program and manual are available at CIEPCA; please contact the CIEPCA Coordinator.

Cover crops directory

The directory on cover crops in Africa is composed of persons interested in R&D or in the promotion of cover crops in Africa. All the Cotonou workshop participants expressed their wish to be in this directory. Others who would like to be included should fill in the form on the last page of this newsletter. You can make photocopies of the form and distribute them to your colleagues.

Please return the form to the CIEPCA Coordinator in order to receive future issues of the newsletter.

Contributions on experiences, research or observations, literature, etc., on cover crops are most welcome and may be sent to the CIEPCA Coordinator for publication in future issues of the newsletter. Brief articles (one page or less) can be included in the newsletter as submitted, however the editorial committee will be happy to summarize a longer report.

Next issue

The next issue of the newsletter, due in August-September 1998, will include the following :

- List of the presentations at the Cotonou workshop on cover crops
- Abstracts of selected documents available at CIEPCA library
- Reports from the colleagues from West Africa who attended the global workshop on cover crops in Brazil.
- Information on other databases of cover crops

Editorial Committee:

A.C. Etèka (CIEPCA Coordinator)
R.J. Carsky (IITA/RCMD)
S.A. Tarawali (IITA/ILRI)
T. Owoeye (IITA Information Services)

Translation: IITA Information Services

Publisher: CIEPCA
08 B.P. 0932 Tri Postal
Cotonou, Benin
(West Africa)
Tel: 229-35 01 88
Fax: 229-35 05 56
E-mail: <a.eteke@cgnet.com>

Directory form on Cover Crops in Africa
(Please fill in and send back to CIEPCA Coordinator⁶)

Name (in capital letters):

First name (s):

Profession:

Title:

Telephone (home):

Mailing Address (PO Box):

Town:

Street:

Country:

E-mail:

Fax:

Language in which you wish to receive the newsletter: French () English ()

Name of your institution or section :

Name of the Section Director :

Governmental institution () NGO ()

Telephone (office):

E-mail:

Fax:

Information (description) on the location of your work place:

Brief description of your experiences on cover crops:

Title of your article for the next newsletter:

⁶ CIEPCA Coordinator
08 B.P. 0932 Tri Postal
Cotonou, Benin
(West Africa)
Tel: 229-35 01 88
Fax: 229-35 05 56
E-mail: <a.eteke@cgnet.com>