

LU·BI·LO·SA³

The Newsletter of Phase 3 of the LUBILOSA Programme LUBILOSA - Lutte Biologique contre les Locustes et Sauteriaux The Biological Control of Locusts & Grasshoppers

Issue No. 1 Oct 1996

WELCOME

Welcome to the first Newsletter of the LUBILOSA Programme. The Newsletter is produced to keep collaborators and all other interested parties and individuals informed of the latest developments and achievements in the LUBILOSA Programme, and more generally to ensure free flow of information and ideas relating to the biological control of locusts and grasshoppers. In this first issue we have concentrated on providing a range of background information on LUBILOSA for all those new to the programme and hence those less familiar with its roots, goals and achievements to date. In later additions we will keep you up-to-date with current developments and explore some of the opportunities these offer for the future of locust and grasshopper control.

LUBILOSA is an international collaborative research and implementation programme funded by the Governments of Canada, Switzerland, the Netherlands and the UK with the goal to integrate the use of a mycoinsecticide based on the entomopathogenic fungus *Metarhizium flavoviride* into control strategies for locusts and grasshoppers. Phase 1 of LUBILOSA demonstrated the technical possibility of using indigenous African fungi as mycoinsecticides to replace chemical pesticides for locust and grasshopper control. Phase 2 demonstrated the feasibility of this technology in field trials on a small to medium scale, using equipment currently in operational use, against a range of targets. Further development of the mycoinsecticide technology has been strongly encouraged by African governments, African regional institutions (CILSS, OAU) and international organizations (FAO, EMPRES).

The success of the programme has attracted interest and commitment not only from LUBILOSA sponsors and African states but from countries around the world, including Australia, Brazil, China, Pakistan, Philippines and Colombia. Socio-economic studies have demonstrated the interest of crop protection services, NGOs and farmers to experiment with mycoinsecticides and indicated the existence of viable commercial niche markets for short-term uptake of mycoinsecticide production and use in Africa. LUBILOSA collaborators and other key research institutions involved in alternatives to chemical control of acridids, including INSAH and GTZ, have now pooled expertise to take mycoinsecticide research and application forward into a third phase aimed at end users and an IPM approach.

LUBILOSA is funded by the Governments of Canada (CIDA; Canadian International Development Agency), Switzerland (SDC; Swiss Development Cooperation), the Netherlands (DGIS; Directorate General for International Cooperation) and the UK (ODA; Overseas Development Administration).

LUBILOSA Contact Names and Address

CAB International Institute of Biological Control
Silwood Park, Buckhurst Road, Ascot, SL5 7TA, UK.
Fax: 44 1344 875007
Tel: 44 1344 872999
E-mail: CABI-IIBC@CGNET.COM
Contact: Dr. David Dent, Programme Manager

International Institute of Tropical Agriculture
Plant Health Management Division,
B.P. 08-0932, Cotonou, Benin.
Fax: 229 350556
Tel: 229 350553 / 350188
E-mail: IITA-BENIN@CGNET.COM
Contact: Dr. Chris Lomer, Programme Leader

CILSS-INSAH
BP 1530, Bamako, Mali.
Fax: 223 225980
Tel: 223 224681
Contact: Dr. M.S. Sompo-Ceesay

CILSS-AGRHYMET
BP 1265-25, Niamey, Niger.
Fax: 227 732237
Tel: 227 732181
E-mail: AGRHYMET.CENTER@HIS.COM
Contact: Dr. J. S. Oliveira

GTZ
Postfach 5180
65726 Eschborn, Germany
Fax: 49 6196 79 7413
Tel: 49 6196 79 3289
E-mail: GTZ-POHASY@GEOD.GEONET.DE
Contact: Dr. Stephan Krall

A LEAP OF IMAGINATION

The first crucial step of any invention is the leap of imagination that produces the idea (see box). The invention that led to the development of the LUBILOSA mycoinsecticide formulation was no different. The leap of imagination here was made by a former IIBC scientist Chris Prior when he considered the possibility of formulating the conidia of Deuteromycete fungi in oil as a means of enhancing their efficacy and employing them in arid environments. The idea of using oils to enhance efficacy was contrary to accepted opinion at the time, since many oils are fungitoxic. However, work carried out by Chris Prior and his team quickly identified the potential of the approach, which subsequently led to the establishment of the LUBILOSA Programme in 1989 and a patent in 1991. Initially the Programme was purely research driven but Phase 2 saw the leap to testing the *Metarhizium* as a field control agent. The Programme expanded to include field testing with PVs in Benin, Burkino Faso, Mali, Senegal, Chad, Mauritania, Sudan and South Africa.

LUBILOSA enters Phase 3 with a provisional mycoinsecticide product, spores of *Metarhizium flavoviride* are produced at LUBILOSA's plant at IITA, Cotonou to an exacting specification. These dry spores are packaged and distributed to collaborators.

Implementation involves the incorporation of LUBILOSA's *Metarhizium* product into grasshopper IPM schemes at selected sites and promotion of imaginative schemes to ensure the uptake and distribution of this valued biological control product.

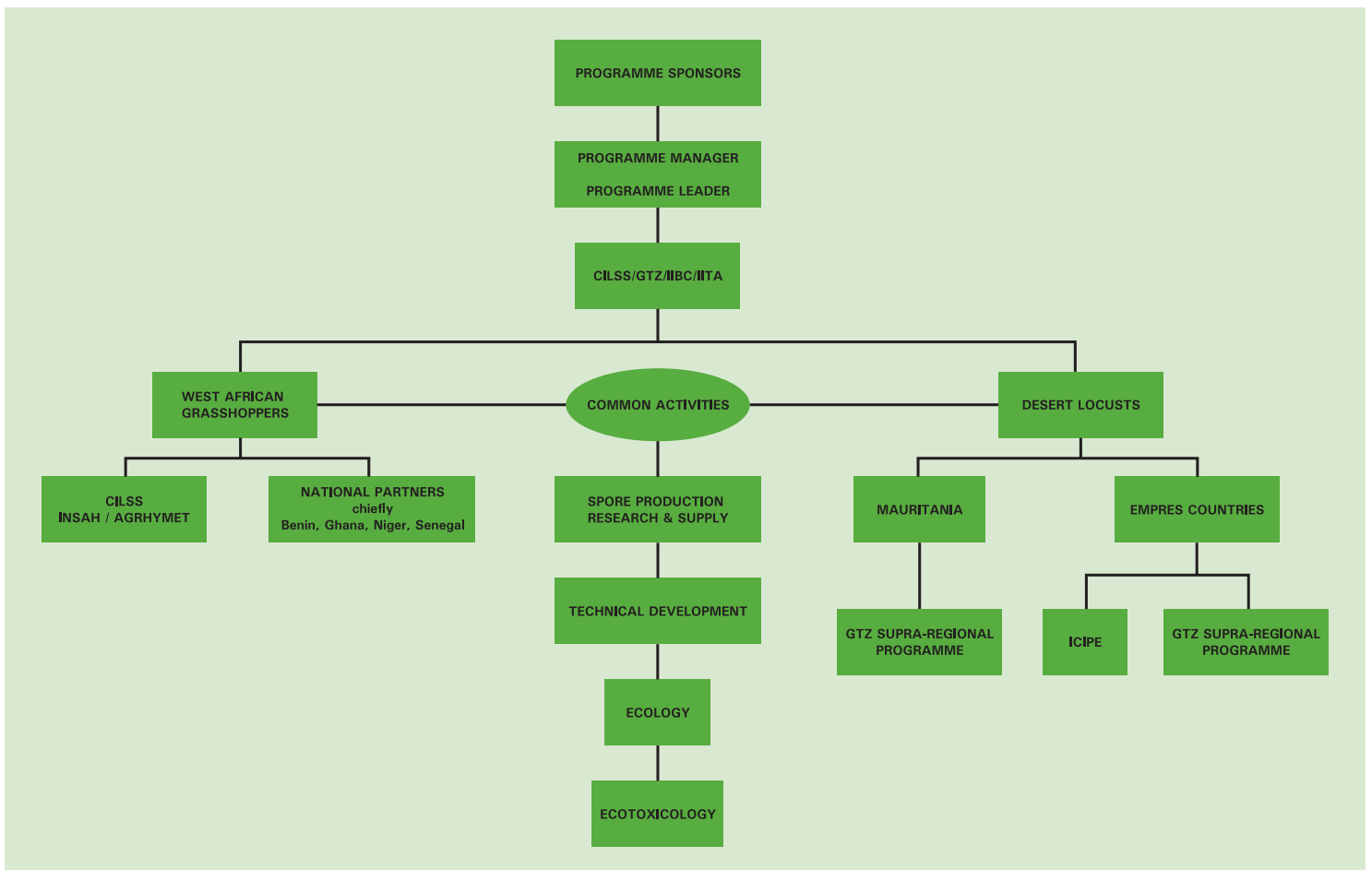
"It has been just so in all my inventions. The first step is an intuition - and comes with a burst, then difficulties arise. This thing gives out and then that - "bugs" - as such little faults and difficulties are called - show themselves, and months of anxious watching, study and labour are requisite before commercial success or failure is certainly reached..... I have the right principle and am on the right track, but time, hard work and some good luck are necessary too.."

Thomas A. Edison Letter to T. Pukas
1878 The Edison Library Archives

ORGANIZATION OF LUBILOSA

LUBILOSA 3 is a research and implementation programme organized to ensure both the development and utilization of the mycoinsecticide for the control of West African Grasshoppers and Desert Locusts (Figure 1). The research activities are grouped under the four headings of spore production and supply, technical development, ecology and ecotoxicology. Each of these components make an important contribution to the development of a viable mycoinsecticide for use by farmers in the Sahel and for Locust Control Campaigns. Phase 3 has been expanded to include GTZ and CILSS as full partners along with a commitment to farmer participation in the integration of the mycoinsecticide into sustainable control strategies.

Fig 1. Organizational structure of LUBILOSA.



THE PHASE 3 CHALLENGE

The development of a mycoinsecticide from the conceptual stage all the way through the processes of strain selection, formulation, production and safety testing, in the context of a 7 year, multidonor, multinational, interdisciplinary research and development programme is truly a remarkable achievement, a real testament to the commitment, collaboration and capabilities of a dedicated team of scientists.

The challenge for Phase 3 is maintaining the team's momentum throughout the whole of the implementation process. There will be a greater emphasis on the socio-economics of production, supply and utilization of the mycoinsecticide and a concentration of effort towards deliverable outputs and involvement of farmers, national collaborators and commercial companies. Such changes in emphasis requires a revaluation of priorities, and a different attitude towards research. Despite inevitable difficulties in such a transition the LUBILOSA team has already adapted to the challenge and has carried out a range of trials with NGOs and National Programmes. In addition scientists in Niger and Mali have carried out their own trials with the Mycoinsecticide.

"It is the function of creative men to perceive the relations between thoughts, or things, or forms of expression that may seem utterly different, and to be able to combine them into some new forms - the power to connect the seemingly unconnected."

William Plomer

MAILING LIST

If you are interested in receiving further editions of the LUBILOSA 3 NEWSLETTER then please complete the form below and return it to Sarah Huddison who will add you to the mailing list.

Recent LUBILOSA publications:

Jenkins, N.E. and Thomas, M.B. (1996) Effects of formulation and application method on the efficacy of aerial and submerged conidia of *Metarhizium flavoviride* for locust and grasshopper control. *Pesticide Science* **46**, 299 - 306

Moore, D., Douro-Kpindou, O.K., Jenkins, N.E. and Lomer C.J. (1996) Effects of moisture content and temperature on storage of *Metarhizium flavoviride* conidia. *Biocontrol Science & Technology* **6**, 51 - 61

Moore, D., Higgins, P.M. and Lomer, C.J. (1996). Effects of simulated and natural sunlight on the germination of conidia of *Metarhizium flavoviride* and interactions with temperature. *Biocontrol Science & Technology* **6**, 63 - 76

Wood, S.N. and Thomas, M.B. (1996) Space, time and persistence of virulent pathogens. *Proceedings of the Royal Society of London B*. **263**, 673 - 680

LUBILOSA : Student Theses

Ouédraogo, A., (1996) Conditions d'infection des acridiens par l'hyphomycete entomopathogene, *Metarhizium flavoviride* et variabilité de la tolérance aux contraintes climatiques des isolats fongiques candidats à la lutte antiacridienne. Mémoire de Docteur en Science, Université de Paris Sud, France, 69 pp. (PhD)

Sagbohan, J., (1996) Caractérisation des souches de *Metarhizium flavoviride* et inter-specificité avec quelques acridiens tels que *Zonocerus variegatus*, *Schistocerca gregaria*, *Locusta migratoria* et *Hieroglyphus daganensis*. Université de Dschang, Caméroun (PhD)

Ayitchehou, V.S., (1996) Effets du champignon entomopathogère, *Metarhizium flavoviride* sur les ennemis naturels : cas de *Cotesia* sp. Diplome d'Ingenieur des Travaux, Université Nationale du Bénin

Dado Doko, I., (1996) Dispersion, préférence variétal du criquet paunt, *Zonocerus variegatus* dans les agroécosystèmes du Sud-Bénin, et mise en évidence des pheromones sexuelles. Diplôme d'Ingenieur Agronome, Université Nationale du Bénin.



TITLE _____ SURNAME _____ (Other Names _____)

POSITION _____

ORGANIZATION _____

ADDRESS _____

TEL:

FAX:

E-MAIL:

LUBILOSA PROFILES

The Profile section will be a regular feature of the Newsletter. Each addition will profile individuals from the different groups in LUBILOSA, starting in this issue with David Dent, the new Programme Manager and Jane and Belinda, new Research Assistants to LUBILOSA based at IIBC.



David Dent is the new Programme Manager for the important Phase 3 of the LUBILOSA Programme with responsibility for ensuring its implementation and successful conclusion. This means a commitment to ensuring the programme achieves its objectives, maximises its outputs and delivers a mycoinsecticide for the biocontrol of grasshoppers and locusts. Such a commitment has been demonstrated by all of the LUBILOSA team in the earlier phases of the Programme and one which David is prepared to match in his role as Programme Manager of this third phase.

David is no stranger to large multidisciplinary multinational research programmes; from 1990-1994 he was Technical Manager of a large EU funded IPM Programme in olives including 12 institutes, 60 scientists from 4 countries, Spain, Italy, Greece and the UK. For the last two years he was Marketing and Product Development Manager for a University based R&D Company, Insect Investigations Ltd in Cardiff, where he gained important commercial experience. With a BSc degree specialising in ecology, a PhD on aphid biology and hostplant relationships and a range of postdoctoral research experience in the tropics, including microbial pesticide development, pheromone monitoring and control systems and pesticide application techniques, David has a broad knowledge and understanding of pest management problems. He is the author of two books on the subject of pest management, the most recent of which deals with integration of control measures through research management.

The LUBILOSA team would also like to extend their thanks and best wishes to Bill Steele and Chris Prior who have left the Programme during Phase 3. We wish them every success in their new endeavours, and look forward to the opportunity to welcome them when they next visit.

A welcome also to the GTZ and CILSS staff who have joined LUBILOSA and who will be profiled in later editions of LUBILOSA 3.



Jane Gunn Research Assistant

Jane has a BSc from Bath University in Pharmacology and previously worked as Study Director in charge of pyrogen and safety toxicity testing at Toxicol Laboratories, UK before having a career break for her two children, Matthew and David. Jane is now responsible for establishing Good Laboratory Practice (GLP) for the Insect Pathology Laboratories at IIBC, UK, maintaining and improving the pathogen collection, updating the pathogen database as well as a whole range of experimental work contributing to the LUBILOSA research programme. In addition, Jane will provide training services in Microbiology for students trainees and visitors.



Belinda Luke Research Assistant

Belinda recently graduated from the Royal Holloway College, University of London with a BSc in Environmental Biology. Utilizing this and previous employment experience in both education and health, Belinda is carrying out research to improve conidial quality of *Metarhizium flavoviride*, the mass production of the fungus on rice, as well as dealing with the maintenance of the insect cultures. As if this isn't enough Belinda has responsibilities outside of LUBILOSA providing technical assistance to other Insect Pathology projects at IIBC, UK.

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LUBILOSA
International Institute of Biological Control
Silwood Park
Ascot
Berkshire
SI5 7TA
United Kingdom