



## **Update on Inoculant production by cooperating laboratories**

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## **N2Africa**

**Putting nitrogen fixation to work  
for smallholder farmers in Africa**





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## Introduction

Each of the 8 countries participating in the N2Africa project has one co-operator laboratory identified, which is supposed to lead in the Rhizobiology activities of the project. The laboratories are as presented in Table 1. Of these laboratories, four have a history of inoculant production. They are the Soil Productivity Research Laboratory (SPRL) Zimbabwe, MIRCEN Nairobi, ISAR Rwanda and Chitedze Research Station Malawi. Milestone 3.4.3. **(By month 6 of year 2, at least 50,000 inoculant packets produced per year in at least 4 cooperating laboratories, increasing in years 3&4. (3.4.3))** requires that 3 of these laboratories should be producing at least 50,000 packets per year by Month 12 of Year 2 (October 2011). This report provides information on the current inoculant production volume of N2Africa partner laboratories.

**Table 1.** Partner laboratories involved in N2Africa Rhizobiology activities

S/N	Country	Laboratory	Location	Year established	Inoculant production	Quantity produced in 2010
1	DRC	Soil Microbiology Laboratory	Bukavu		No	None
2	Ghana	Soil Research Institute	Kumasi		No	None
3	Kenya	MIRCEN/University of Nairobi	Nairobi	1977 (2008)	Yes	ND
4	Kenya	MEA Fertilizer Ltd.	Nakuru	1977	Yes	25,000
5	Malawi	Chitedze Research Station	Chitedze, Lilongwe	1964	Yes	15,000
6	Nigeria	Institute of Agricultural Research (IAR)	Samaru, Zaria	1963	No	None
7	Rwanda	Institut des Sciences Agronomique du Rwanda (ISAR)	Robena	1984	Yes	ND
8	Mozambique	IIAM	Nampula	Under construction	No	None
9	Zimbabwe	Soil Productivity Research Laboratory (SPRL)	Marondera	1964	Yes	80,000

Year in parenthesis is the year inoculant production commenced; ND = Not determined

## MIRCEN Nairobi

The Nairobi MIRCEN project located at the University of Nairobi was founded in 1977 when it started developing inoculants for various legumes including pulses, pasture legumes and trees. The centre has since 1981 been producing an inoculant known as BIOFIX which comes in 100 g packets, with one packet sufficient to adequately inoculate 10 kg of seeds needed per hectare of common beans and soybean. The average sales of MIRCEN's inoculants peaked in the 1990s at about 1,350 kg per year.

In 2008, the production of Biofix inoculants was taken over by a private company, MEA Fertilizer Company Ltd., with MIRCEN Nairobi retaining quality control responsibilities. MEA also signed a memorandum of understanding (MOU) with N2Africa in 2011 for the project to provide technical backup and quality assurance assistance to the company. The company started by producing 400 sachets of Biofix weekly at the cost of about \$2.5 per sachet. The



company is targeting production at 1000 sachets per week in future. The company has so far sold 13,450 packets in 2011 and are targeting a sales figure of 50,470 packets by the end of the year.

## **Soil Productivity Research Laboratory (SPRL) Zimbabwe**

The Soil Productivity Research Station (SPRL) in Zimbabwe is one of the largest in sub-Saharan Africa. It is government owned and operated on a semi commercial basis. Inoculant production at SPRL started in 1962 with the production of inoculants for pasture legumes, mainly lucerne and clover species. Production of soybean inoculants commenced in 1967 and currently accounts for more than 90% of the inoculants. The factory at SPRL has an annual capacity of about 200,000 packs of 100g units. However, its current production level is about 60,000 units annually. The factory produced about 80,000 units in 2010 but sold only 29,000 because the other packets matured after the planting window had passed. The production target for this year is 100,000 but is beset with problems of inadequate water and electricity supplies. The factory is connected to a generator but prohibitive diesel cost does not allow for a cost-effective production.

## **Rwanda**

The Institut des Sciences Agronomique du Rwanda (ISAR) started inoculant production in 1984 and had reached an annual production level of 2.4 tonnes by 1990 (Cassien and Woome, 1998). However, activities were disrupted by the civil war in 1994. The laboratory was destroyed and all of the rhizobial strains and their documentation were lost. The laboratory was rehabilitated later and new equipment installed. Between 1995 and 2005, the laboratory was producing between 6000 and 8000 packets of inoculant. Since 2005, the laboratory has not been working at full capacity due to inadequate equipment and lack of qualified staff. Recently, however, a staff of the institute returned after M.Sc. training at Makerere University in rhizobiology and leads three other staff in laboratory operations. As a condition to participation in N2Africa, ISAR agreed to rehabilitate a small greenhouse for use in rhizobiology activities and N2Africa supplied some reagents, glassware and equipment to the laboratory. This intervention enabled the laboratory to quickly isolate and characterize 80 cultures of bean rhizobia and produced 700 packets of rhizobial inoculant. However, a quality assurance mechanism needs to be put in place at ISAR to allow for the production of high quality products.

## **Malawi**

The Microbiology laboratory of Chitedze Agricultural Research Station, Lilongwe, was built in 1964 but the production of commercially available inoculants started from 1975. Going by the brand name of Fertilizer for Legumes, inoculants for several pasture and grain legumes were produced and sold in 50 g packets. Sales rose from 450 packets in 1976 to about 1800 in 1987/88. Production figures since 2005 have been at about 20,000 units of 50 g per annum at the cost of about US \$0.40 per unit. Inoculants are currently produced for groundnut, common bean, soybean and pigeonpea. The laboratory produced about 15,000 units of 50 g packs for soybean and bean in 2010 and has plans to produce similar quantity in 2011. However, quality control in recent times has not been effectively implemented, with quality checks on the mother cultures being almost non-existent, and there is no quality control on the finished product.



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## Conclusion

Both SPRL and MEA appear poised to exceed the target of 50,000 packets per annum. However, ISAR and Chitedze are unlikely to meet this target and will instead require the project's intervention at enhancing product quality. This will further enhance the efficacy of their products and will likely create greater demand for them.



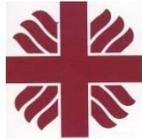
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## List of project reports

1. N2Africa Steering Committee Terms of Reference
2. Policy on advanced training grants
3. Rhizobia Strain Isolation and Characterisation Protocol
4. Detailed country-by-country access plan for P and other agro-minerals
5. Workshop Report: Training of Master Trainers on Legume and Inoculant Technologies (Kisumu Hotel, Kisumu, Kenya-24-28 May 2010)
6. Plans for interaction with the Tropical Legumes II project (TLII) and for seed increase on a country-by-country basis
7. Implementation Plan for collaboration between N2Africa and the Soil Health and Market Access Programs of the Alliance for a Green Revolution in Africa (AGRA) plan
8. General approaches and country specific dissemination plans
9. Selected soybeans, common beans, cowpeas and groundnuts varieties with proven high BNF potential and sufficient seed availability in target impact zones of N2Africa Project
10. Project launch and workshop report
11. Advancing technical skills in rhizobiology: training report
12. Characterisation of the impact zones and mandate areas in the N2Africa project
13. Production and use of Rhizobial inoculants in Africa
18. Adaptive research in N2Africa impact zones: Principles, guidelines and implemented research campaigns
19. Quality assurance (QA) protocols based on African capacities and international existing standards developed
20. Collection and maintenance of elite rhizobial strains
21. MSc and PhD status report
22. Production of seed for local distribution by farming communities engaged in the project
23. A report documenting the involvement of women in at least 50% of all farmer-related activities
24. Participatory development of indicators for monitoring and evaluating progress with project activities and their impact
25. Suitable multi-purpose forage and tree legumes for intensive smallholder meat and dairy industries in East and Central Africa N2Africa mandate areas
26. A revised manual for rhizobium methods and standard protocols available on the project website
27. Update on Inoculant production by cooperating laboratories



## Partners involved in the N2Africa project



Caritas Rwanda



Diobass



Eglise Presbiterienne Rwanda



Murdoch  
UNIVERSITY  
PERTH WESTERN AUSTRALIA



Resource Projects-Kenya



Université Catholique de Bukavu



University of Zimbabwe

