Selected soybean, common bean, cowpea and groundnut varieties with proven high BNF potential and sufficient seed availability in target impact zones of N2Africa Project

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1 Introduction

N2Africa project is committed to delivering to farmers the very best technology that is available. The first step in our work was to identify the best varieties to start with of the four major grain legumes we are working with soybean (*Glycine max* L. Merrill), common beans (*Phaseolus vulgaris* L.), cowpea (*Vigna unguiculata* L. Walp), and groundnuts (*Arachis hypogaea* L.). Identified varieties are those considered to have combined adaptation to biotic and abiotic stresses with suitable seed types and grain quality for both farmers and markets. An initial list of suitable varieties was prepared in consultation with legume breeders from the national research institutes, research and development networks including the Pan African Bean Research Alliance – PABRA and East and Central Africa Bean Research, as well as researchers from CGIAR Institutes (IITA- for cowpeas and soybeans, CIAT – for beans and ICRISAT- for groundnuts). This initial list of potential varieties was discussed with stakeholders during country planning meetings and additional varieties were included based on local expert knowledge and availability of seed.

On identifying the legumes, two categories were considered. The first category includes those best varieties that are officially released in the country and do not have restrictions for use by farmers. Some of varieties in this category are included in the dissemination activities, and are being multiplied for future distribution to farmers. The second category includes those best varieties which are not yet released but have high BNF potential. Some varieties in this group, together with those in Category 1 are included in the agronomic trials for further screening for their ability to fix N_2 with different rhizobia strains under different biophysical conditions. Varieties identified to be stronger in N2-fixation will be included in the later dissemination activities.

2 Objectives

This milestone report is particularly relevant to the following project objective: *Objective 2:* Select multi-purpose legumes providing food, animal feed, structural materials and high quality crop residues for enhanced BNF and integrate improved varieties into farming systems

Activities

2.1 Identify and field test best varieties of soybean for high N_2-fixation capacity and adaptation to abiotic and biotic stresses
2.2 Select *Phaseolus vulgaris* bean varieties with high N_2-fixation capacity and adaptation to abiotic and biotic stresses
2.3 Select cowpea and groundnut varieties with high N_2-fixation capacity and adaptation to abiotic and biotic stress conditions..

and the following milestones:

2.1.1 At least 3 existing soybean varieties with proven high BNF potential and sufficient seed availability identified for the impact zones.

2.2.1 At least 3 existing bush and climbing bean varieties with proven high BNF potential, tolerant to biotic and abiotic stresses, and sufficient seed availability identified for the impact zones.

2.3.1 At least 3 groundnut and cowpea varieties with proven high BNF potential identified across the impact zones.

3 Target legumes by impact zones

Detailed information on target impact zones is available in the Report titled "Chacterization of the Target Impact Zones." In Table 1 we provide basic information which justifies the choice of target legumes.

Table 1: General info impact zones, the countries, farming system and corresponding focus legumes,

	Impact zone			**Sources**
	East and Central Africa	West Africa	Southern Africa	
Countries	Kenya, Rwanda, Democratic Republic of Congo	Ghana, Nigeria	Malawi, Mozambique, Zimbabwe	
Agro-ecological zone	Tropical cool humid-sub-humid	Tropical warm sub-humid	Tropical warm sub-humid and semi-arid	FAO/IIASA
Ecoregion	East African arc montane forest And East African Sudanian savanna	Northern Guinea and Sudanian savanna	Southern Miombo woodlands	Burgess et al. 2004
Farming system	Intensive cereal , banana and cassava based, and crop-livestock mixed	Extensive cereal based	Extensive cereal based	Dixon et al. 2001
Target legume	Soybean, common bean	Soybean, cowpea, groundnuts	Soybean, common bean, groundnuts	

Source: *Modified from Rufino et al. 2009*

4 Identified legume varieties by country

4.1 Common bean (*Phaseolus vulgaris*)

Bean varieties identified for the target impact zones in project countries are summarised in Table 2. When identifying bean varieties, two main types of common beans bush beans and climbing beans were distinguished. However, climbing beans were only selected for East and Central African countries (Rwanda, DR Congo and Kenya) where they have been introduced successfully in Rwanda and DR Congo, and for Kenya some climbing bean varieties have been evaluated and released. For Malawi and Zimbabwe only bush beans were considered because of lack of information on the performance of climbing beans. Although it was possible to come up with several bean varieties for all the impact zones, the potential at which these materials will be made to reach farmers differ as it is indicated in the country by country analysis provided below.

Rwanda and DR Congo

In Rwanda and Eastern DR Congo, all the identified materials (bush beans and climbing beans) have been widely tested under farmer conditions and are released. This is largely attributed to the presence of strong bean research programs at ISAR in Rwanda and INERA-Mulungu in DR Congo, as well as the presence of the CILACA project which is promoting integration of legumes (including beans) in different cropping systems of Rwanda and South Kivu in DR Congo.

Kenya

For Kenya, only two identified varieties of bush beans (KTx56 and KTB6) and two varieties of climbing beans (Kenya Mavuno and Kenya Tamu) are released for the areas N2Africa is working in. However, the varieties are little known by farmers and seeds availability is a problem. This means that many efforts need to be put into seed bulking along with dissemination activities.

Malawi and Zimbabwe

Although most of the identified bean varieties have been released, availability of seeds was mentioned as a problem. In these two countries, seed are largely available through commercial seed companies, which at present, were reported not to produce sufficient seeds of legume crops. Deliberate efforts are thus needed to produce enough seeds for use in dissemination campaigns by N2Africa.

4.2 Soybean (*Glycine max*)

The best soybean varieties identified for the target impact zones in project countries are summarised in Table 3. Nigeria, Kenya, Malawi and Mozambique have several improved soybean varieties with most of them being developed by IITA, most recently through the TLII project. In Zimbabwe improved varieties have been developed and are marketed by SeedCo and also varieties marketed by Arda Seeds, FSI Seeds and Pannar Seeds. Many of these commercial varieties could be suitable in southern Africa, and perhaps further afield. In many countries most of the materials are old and yield poorly, although they are well adapted to the existing biophysical conditions and have desirable organoleptic taste characteristics for the local farmers. The best soybean available in some countries will be introduced to others e.g. some materials from Nigeria to Ghana, Kenya to DR Congo and Rwanda and Malawi to Mozambique and Zimbabwe for evaluation in agronomic trials. In Zimbabwe, soybean variety SC Squire was identified to have good tolerance to soybean rust disease. This material will be included in the agronomic trials in Malawi and Mozambique (to start with) to be tested along with the new materials selected for rust resistance by TLII.

4.3 Groundnut (*Arachis hypogaea*)

As for soybean, the countries Nigeria, Malawi and Mozambique indicate to be rich in best groundnuts (Table 4), majority being ICRISAT through the TL II project. In the rest of countries most of the materials are old with low yields, although they are well adaptive to the existing biophysical conditions. Deliberate efforts are needed by N2Africa to provide the best groundnut germplasm to Ghana and Zimbabwe.

4.4 Cowpea (*Vigna unguiculata*)

The identified best cowpea materials by countries are summarised in Table 5. Much more research has been done to select cowpea materials for the different agro-ecological zones in Nigeria and Ghana compared with Malawi and Zimbabwe. However, only in Nigeria is sufficient seed of each of the identified materials are available for both dissemination activities and agronomic trials. This means that multiplication activities of selected varieties need to be undertaken to allow for smooth continuation of dissemination activities. Agriseeds have been working with SOFECSA producing seed of several popular varieties of cowpea through a ‘purchase for progress’ programme so sufficient seed of these varieties will be available for purchase.

Table 2. Common bean varieties identified by country

Bean types	East and Central Africa			Southern Africa	
	Kenya	**DRC**	**Rwanda**	**Malawi**	**Zimbabwe**
Bush beans	KATx 56	AFR 708	RWR 1668	MALUWA	IRIS (MCM5001)
	KAT B9	MORE 8802	RWR 2076	MKHOLOPHETHE	SPECKLED EYE (SUG131)
	KT B1	RWR 10	RWR 2154	NAPHIRA	PAN148
	NEW ROSECOCO	MURUNGI	RWR 2245	NUA 45	PURPLE CARD
	KENYA UMOJA	CDMLB001	RWR 1180	NUA 59	CB1
				VTTT/924/4	PAN 148
Climbing beans	KENYA MAVUNO	AND 10	RWV 2070		PAN 159
	KENYA TAMU	NYIRAMUHONDO	GASILIDA		IRIS
	UMUBANO	MUSALE	MAC 44		DARDINAL
	KENYA SAFI	KIAGARA	MAMESA		BAUNTY
		VCB 8102	CAB 2		

East and Central Africa - Kenya – Western Kenya -Bondo, Teso, Vihiga, Butere, Bungoma, Kakamega, Busia, Migori; Rwanda – Climbing beans in North- Gakenke, Burera, Bush beans in East and South – Kamonyi Bugesera, Kayonza, DRC – Sud-Kivu (Karehe, Kabale, Walungu, Burhinyi); **Southern Africa** - Malawi – Central Ntcheu-Sangano, Dowa; Zimbabwe – Murewa, Mudzi.

Table 3. Soybean varieties identified by country

West Africa		**East and Central Africa**			**Southern Africa**		
Ghana	**Nigeria**	**Kenya**	**DRC**	**Rwanda**	**Malawi**	**Mozambique**	**Zimbabwe**
TGX1448-2E	TGx1830	TGx1740-2F (SB19)	TGx1740-2F (SB19)	TGx1740-2F (SB19)-	NASOKO	TGx1904-6F	SC Squire
ANIDASO (TGx813-6D)	TGx1830	EAI3600	TGx1740-2F	TGx1740-2F	MAKWACHA	TGx1740-2F	SC Squire 1
TGx536-02D	TGx1485-E	TGx1740-2F (SB8)	449/16	SOPROSY	OCEPARA-4	TGx1908-8F	SC Saga
SALENTUYA (TGx297-192C)	TGx1487-E	NAMSOY 4m (SB25)	PK6	PK6	MAGOYE	TGx1485-1D	MAGOYE
JENGUMA TGx1830	TGx1448-2E TGx1904	TGx1835-10E (SB 3) -	IMPERIAL	YEZUMUTIMA	SC-SQUIRE TGx1740-2F	TGx1937-F SC-Squire	EDAMANE SAFARI
QUARSHIE	TGx1945	-			TGx1987-62F	SC - Saga	SERENADE
TGx1834-SE	TGx1951				TGx1987-11E		ROAN
	TGx1935				TGx1987-10E TGx1835-10E		

West Africa – Northern and southern Guinea Savannah and Sudan Savannah (Northern region, upper West and upper East – Ghana; Kaduna and Kano states- Nigeria). **East and Central Africa** - Kenya – Western Kenya -Bondo, Teso, Vihiga, Butere, Bungoma, Busia, Migori; Rwanda –East and South – Kamonyi Bugesera, Kayonza, DRC – Sud-Kivu (Karehe, Kabale, Walungu, Burhinyi); **Southern Africa** – Malawi-Salima, Ntcheu-Sangano, Dowa, Mchinji, Lilongwe, Kasungu; Zombabwe- Wedza, Murewa, Mudzi, Makoni West, Chegutu; Mozambique-.Sussundenga in Manica, Gurue in Zambezia and Angonia in Tete,

Table 4. Groundnut varieties identified by country

West Africa		**Southern Africa**		
Ghana	**Nigeria**	**Malawi**	**Zimbabwe**	**Mozambique**
CHINESE	SAMNUT21 (UGA-2)	K (JL24)	JESA (ICGV-SM 86068)	ICGV 93437 SM 99658
MANIPINTA	SAMNUT22 (M572.80I)	CHITALA(ICGV-SM 99568)	ILANDA (ICGV 94297	ICGV 94297 SM 99541
SAMNUT 21 (UGA-2)	SAMNUT23(ICGV-IS 96894)	NSINJIRO (ICGV-SM 90704)	NYANDA (ICGV 93437)	NEMETIL (ICGV 12991)
NKATIESARI	RMP12	BAKA (ICG 12991)	ROAN	CG 7 (ICGV-SM 83708)
SAMNUT 22	BT19	CHALIMBANA 2005	NATAL	JL 25
SAMNUT 23	EXDAKAR	CG7 (ICGV-SM 83708)		MAMANE (ICGV-SM 90704)
		ICGV-SM 01708		
		ICVGV –SM 01731		
		ICGV-SM 01514		
		ICGV-SM03572		
		MALUMBA		

West Africa – Northern and southern Guinea Savannah and Sudan Savannah (Northern region, upper West and upper East – Ghana; Kaduna and Kano states- Nigeria). **Southern Africa** – Salima, Dowa, Lilongwe, Kasungu, Mchinji- Malawi; Moputvulal in Mampula province – Mozambique; Mhondoro, Murewa, Makoni West- Zimbabwe.

,**Table 5. Cowpea varieties Identified by country**

West Africa		**Southern Africa**	
Ghana	**Nigeria**	**Malawi**	**Zimbabwe**
IT87D-611-3	IT90K-277-2	IT18	IT18
IT87D-2075	IT97K-499-35	IT00K-1263	IT00K-1263
IT83S-728-13	IT89KD-288	IT277-2	CBC1
IT83S-818	IT89KD-391	IT499-35	CBC2
IT82E-16	IT93K-452-1	IT452-1	-
BAWUTAWUTA	IT89KD-374.	IT573-1-1	-
APAGBALA	DANILLA	-	-
OMONDOO			
IT99K-573-1-1			
BROWN EYE			

West Africa – Northern and southern Guinea Savannah and Sudan Savannah (Northern region, upper West and upper East – Ghana; Kaduna and Kano states- Nigeria).
Southern Africa: Malawi-Salima; Zimbabwe Mhondoro and Wedza.

5. Legume varieties used in adaptive research and dissemination campaigns

From a long list of identified legume varieties (Tables 2 - 5), only a few listed in Tables 6a-6e are included in adaptive research trials and dissemination campaigns. These are the varieties for which sufficient seed was readily available. While we acknowledge that legume varieties currently used in dissemination might not be the best for BNF efficiency and grain yield, we had to go ahead using them to demonstrate to farmers other requirements to improve legume production including the application of fertilisers e.g. phosphorus and use of inoculants. Meanwhile, other varieties with limited seeds are being multiplied and included in agronomic trials to evaluate their grain yield, BNF efficiencies and other important agronomic traits compared with those currently used in the dissemination campaigns. The best varieties will then be disseminated to farmers.

Table 6a. Bush bean varieties used (to be used) in adaptive research and dissemination campaigns, their characteristics, origin and source of seeds by country. *denotes varieties used only in dissemination campaigns.

	Variety	Important traits	Origin	Where (pre) released?	TL-II variety?	Source/obtained from
Kenya	Kenya Umoja	High yielding, disease resistant	Rwanda	Kenya	No	Un. of Nairobi
	New Rosecoco*	Disease resistant	Rwanda	Kenya	No	Un. of Nairobi
	KAT B1	Bean Mosaic resistant, suited to low and medium altitude	Rwanda	Kenya	Yes	KARI Katumani
	KAT B9	Bean Mosaic resistant, suited at low and medium altitude	Rwanda	Kenya	Yes	KARI Katumani
	KAT X56	Resistant to Bean Mosaic, Drought tolerant suited to low and medium altitude	Rwanda	Kenya	Yes	KARI Katumani
Rwanda	RWR1668	Early maturity, tolerant to most diseases, drought tolerant, cooks faster	Rwanda	Rwanda	Yes	ISAR- Rwanda
	RWR2076*	Early maturity, tolerant to most diseases, drought tolerant	Rwanda	Rwanda	Yes	ISAR- Rwanda
	RWR2154	Early maturity, tolerant to most diseases, tolerant to heavy rain conditions	Rwanda	Rwanda	Yes	ISAR- Rwanda
	RWR2245	Early maturity, tolerant to most diseases, drought tolerant	Rwanda	Rwanda	Yes	ISAR- Rwanda
	RWR1180*	Early maturity, tolerant to most diseases, drought tolerant	Rwanda	Rwanda	Yes	ISAR-Rwanda
DR Congo	CODMLB 001	Early maturity, tolerant to most diseases, drought tolerant	DRC	DRC	No	INERA- Mulungu
	AFR 708*	Early maturity, tolerant to most diseases, drought tolerant	DRC	DRC, Rwanda,	No	INERA- Mulungu
	MORE 8802	Early maturity, tolerant to most diseases, drought tolerant	DRC	DRC	No	INERA- Mulungu
	RWR 10	Early maturity, tolerant to most diseases, drought tolerant	Rwanda	DRC, Rwanda	No	INERA-Mulungu
	Murungi*	Early maturity, high yielding, resistant to common diseases, farmer preferred		DRC	No	INERA- Mulungu

		variety				
Malawi	Maluwa	High yielding, resistant to common diseases	Chitedze_ARI	Malawi	No	Chitedze-ARI, seed companies
	Nkholophethe	High yielding, medium maturing	Chitedze- ARI	Malawi	No	Chitedze ARI, seed companies
	Naphira	High yielding, early maturing	Chitedze-ARI	Malawi	No	Chitedze ARI, seed companies
	NUA 45*	High yielding, drought resistant	Chitedze-ARI	Malawi	No	Chitedze ARI
	NUA 59	High yielding, drought resistant	Chitedze-ARI	Malawi	No	Chitedze ARI
	VTTT/924/4	High yielding, Zinc and iron rich	Chitedze-ARI	Malawi	No	Chitedze ARI
Zimbabwe	Purple card	High yielding, drought tolerant	-	Zimbabwe	No	Seed companies
	Cardinal	High yielding, early maturing	-	Zimbabwe	No	Seed companies
	PAN 148	High yielding,	-	Zimbabwe	No	Seed companies
	PAN 159	High yielding, early maturing		Zimbabwe	No	Seed companies
	Speckled Eye	High yielding, early maturing	-	Zimbabwe, Malawi	No	Seed companies

Table 6b. Climbing bean varieties used in adaptive research and dissemination campaigns, their characteristics, origin and source of seeds by country. *denotes varieties used only in dissemination campaigns.

Country	Variety	Important traits	Origin	Where (pre)released?	TL-II variety?	Source/obtained from
Kenya	Kenya Tamu*	Large seeded, resistant bean mosaic	Rwanda	Kenya		University of Nairobi
	Kenya Mavuno*	Large seeded, resistant bean mosaic		Kenya		University of Nairobi
	Umubano	Small seeded, resistant to Bean mosaic disease, suited to medium altitude	Rwanda	Kenya		KARI, Kakamega
Rwanda	Gasilida*	High yielding, resistant to most diseases	Rwanda	Rwanda	No	ISAR- Rwanda
	RWV2070*	High yielding, resistant to most diseases, cooks fast	Rwanda	Rwanda	No	ISAR- Rwanda
	MAC44	High yielding, high biomass	Rwanda	Rwanda	No	ISAR- Rwanda
	Mamesa,	High yielding, tolerant to common diseases	Rwanda	Rwanda	No	ISAR- Rwanda
	CAB 2	High yielding, high biomass, tolerant to common diseases	Rwanda	Rwanda	No	ISAR- Rwanda
DR Congo	VCB 81012	High yielding, grow on poor soils	DR Congo	DRC south Kivu		INERA- Mulungu
	AND 10*	High yielding, high biomass production, tolerates heavy rain conditions	DR Congo	DRC south Kivu		INERA- Mulungu
	Musale	High yielding, high biomass, good market	DR Congo	DRC south Kivu		INERA- Mulungu
	MAC 44*	High yielding, high biomass, cooks faster	DR Congo	DRC south Kivu		INERA- Mulungu
	Nyiramuhondo	High yielding, tolerates common disease, grow on low fertility soils	DR Congo	DRC south Kivu		INERA -Mulungu

Table 6c. Soybean varieties used in adaptive research and dissemination campaigns, their characteristics, origin and source of seeds by country. *denotes varieties used only in dissemination campaigns.

Country	Identified varieties	Important traits	Origin	Where (pre) released?	TL-II variety?	Source/obtained from
Kenya	TGx 1740-2F (SB19)*	Promiscuous, medium duration	Nigeria	Kenya	Yes	TSBF-Maseno
	TGx 1895-33F (SB8)	Promiscuous, medium duration	Nigeria	Kenya	Yes	TSBF-Maseno
	NAMSOY 4m (SB25)*	Promiscuous, medium duration, rust tolerant	Uganda	Uganda	Yes	TSBF-Maseno
	TGx 1835-10E (SB3)	Promiscuous, medium duration, rust tolerant	Nigeria	Nigeria (2008) and Uganda (2004)	Yes	TSBF-Maseno
	EAI3600	Specific, short duration	Kenya	Kenya	Yes	KARI Kenya
Rwanda	PK6*	Specific, short duration	As above	As above	NA	TSBF-Kigali
	TGx 1740-2F	As above	IITA	Kenya, DRC	Yes	TSBF-Kigali
	SB24*	As for SB 3	As above	Nigeria (2008) and Uganda (2004)		TSBF-Kigali
	Soprosoy	Specific	ISAR- Rwanda	Rwanda, Burundi	NA	ISAR-Rwanda
	Yezumutima	Specific	ISAR Rwanda	Rwanda, Burundi	NA	ISAR Rwanda
DR Congo	PK 6*	Specific, short duration	Rwanda	DRC, Rwanda, Burundi	NA	CIAT-TSBF – Bukavu
	SB24*	Promiscuous, medium duration	IITA Nigeria	DRC, Rwanda, Uganda, Burundi	Yes	CIAT-TSBF – Bukavu
	449/16-6	Specific, medium duration	Rwanda	DRC, Rwanda, Burundi	NA	CIAT-TSBF – Bukavu
	IMPERIAL	Specific, medium duration	USA	DRC, Rwanda, Burundi	NA	INERA/ Mulungu
	TGx 1740-2F (SB19)	Promiscuous, medium duration	IITA-Nigeria	DRC, Kenya	Yes	CIAT-TSBF in Bukavu
Nigeria	TGx 1835-10E*	Promiscuous, medium duration, rust	Nigeria	Nigeria (2008) and	Yes	IITA-Ibadan, IITA-

		tolerant		Uganda (2004)		Kano
	TGx1830-20E*	Promiscuous, early maturing	IITA-Nigeria	Ghana in 2005	Yes	IITA-Ibadan, IITA-Kano
	TGx1485-1D*	Promiscuous, early maturing, rust susceptible	IITA-Nigeria	Nigeria, Benin and Togo	Yes	IITA-Ibadan, IITA-Kano
	TGx1448-2E	Promiscuous, medium maturing, high biomass, high grain yield	IITA-Nigeria	Nigeria, Benin, Togo and Ghana	Yes	IITA-Ibadan, IITA-Kano
	TGx1904-6F	Promiscuous, medium maturity, high grain and biomass yields	IITA-Nigeria	Nigeria in 2009	Yes	IITA-Ibadan, IITA-Kano
	TGx1945-1F*	Promiscuous breeding line, medium maturity	IITA-Nigeria	Breeding line	Yes	IITA-Ibadan, IITA-Kano
	TGx1951-3F*	Promiscuous breeding line, medium maturity	IITA-Nigeria	Breeding line	Yes	IITA-Ibadan, IITA-Kano
	TGx1935-3F*	Promiscuous breeding line, early maturity	IITA-Nigeria	Breeding line	Yes	IITA-Ibadan, IITA-Kano
Ghana	Anidaso (TGx 813-6D)*	High yielding	IITA-Nigeria	Ghana	No	CRI-Ghana
	Salentuya (TGx 297-192C)	High yielding	Nigeria	Ghana	No	CRI-Ghana
	Jenguma*	High yielding, shattering resistance	CRI	Ghana	No	CRI-Ghana
	Quarshie*	High yielding, shattering resistance	CRI	Ghana	No	CRI-Ghana
	TGx1834-2E	High yielding, trap striga, shattering resistance	IITA-Nigeria	Ghana, Nigeria	Yes	CRI-Ghana
	TGx1448-2E	High yielding, dual purpose, drought resistant	IITA-Nigeria	Nigeria	Yes	
	TGx1904-5F	High yielding, rust resistant	IITA-Nigeria	Nigeria	Yes	
Mozambique	TGx1740-2F*	Promiscuous, early maturity, high grain yield	Nigeria	Mozambique, Kenya	Yes	IITA-Mozambique
	TGx1904-6F	Promiscuous, medium, maturity, high grain and fodder yields	Nigeria	Mozambique, Nigeria	Yes	IITA-Mozambique
	TGx1908-8F*	Promiscuous, medium maturity, high grain yield	Nigeria	Mozambique	Yes	IITA-Mozambique

	TGx1937-1F	Promiscuous maturity, medium maturity, high grain yield	Nigeria	Mozambique	Yes	IITA-Mozambique
	TGx1485-1D	Promiscuous, early maturing, high grain yield	Nigeria	Mozambique, Nigeria, Benin, Togo	Yes	IITA-Mozambique
	SC Saga	High yielding, tolerant to rust	Zimbabwe	Zimbabwe	No	Seed Co
	Safari	High yielding, early maturing	Zimbabwe	Zimbabwe	No	Commercial seed co
	Roan	High yielding,	Zimbabwe	Zimbabwe	No	Commercial seed co
	Serenade	High yielding, susceptible to rust	Zimbabwe	Zimbabwe	No	Commercial seed co
Malawi	Magoye*	Specific variety, high grain yield, medium maturity	Malawi/Zimbabwe	Malawi	Yes	Seed-co ; DARS
	Makwacha*	Specific variety, early maturing, high grain yield, susceptible to rust	Malawi	Malawi	Yes	DARS ; IITA-Malawi
	TGx1740-2F	High yielding	CIATMalawi	Malawi	Yes	CIAT-Malawi
	TGx1987-628	High yielding, dual purpose, Rust tolerant	CIAT-Malawi	Promising variety	Yes	CIAT-Malawi
	TGx1987-11E	High yielding, dual purpose, Rust tolerant	CIAT-Malawi	Promising variety	Yes	CIAT- Malawi
	TGx1987-10E	High yielding, dual purpose, Rust tolerant	CIAT-Malawi	Promising variety	Yes	CIAT-Malawi
	TGX1835-10E*	High yielding, early maturing	CIAT-Malawi	Malawi	Yes	CIAT-Malawi
	SC Saga*	High yielding, tolerant to rust	Seed Co Zimbabwe	Zimbabwe	No	Seed Co
Zimbabwe	SC Saga*	High yielding, tolerant to rust	Seed Co Zimbabwe	Zimbabwe, Malawi	No	Seed Co
	SC Squire	High yielding, drought tolerant	Seed Co Zimbabwe	Zimbabwe, Malawi	No	Seed Co
	SC Squire 1	High yielding, rust and drought tolerant	Seed Co Zimbabwe	Pre-release Zimbabwe	No	Seed Co
	Edamane	Early maturing, farmer preferred	Zimbabwe		No	Seed Co
	TGx1740-2F	High yielding	CIATMalawi	Malawi	Yes	CIAT-Malawi
	TGx1987-628	High yielding, dual purpose, Rust tolerant	CIAT-Malawi	Promising variety	Yes	CIAT-Malawi
	TGx1987-11E	High yielding, dual purpose, Rust tolerant	CIAT-Malawi	Promising variety	Yes	CIAT- Malawi

Table 6d. Cowpea varieties used in adaptive research and dissemination campaigns, their characteristics, origin and source of seeds by country. *denotes varieties used only in dissemination campaigns.

	Variety	Important traits	Origin	Where (pre)released?	TL-II variety?	Source/obtained from
Nigeria	SAMPEA-9 (IT97K 277-2)*	Dual purpose (good grain and fodder yields),acceptable seed quality & good fodder quality	IITA Nigeria	Nigeria, Niger	Yes	IITA-Nigeria
	SAMPEA-10 (IT97K-499-35)*	Early maturing, striga resistant, alectra resistant, good seed quality, field tolerance to major insect-pests.	IITA-Nigeria	Nigeria, Niger	Yes	IITA- Nigeria
	IT99K-573-1-1	Striga and drought tolerant	IITA-Nigeria	Niger, Nigeria	Yes	IITA- Nigeria
	Danila*	Dual purpose for relay or under sowing in cereals	Nigeria land-race	Nigeria	No	IITA- Nigeria
	IT89KD-288*	Photo-sensitive dual purpose line, medium to large white seeds with a rough seed coat. Resistance to major Septoria leaf spot, scab, Bacterial blight and nematodes.	IITA Nigeria		Yes	IITA- Nigeria
Ghana	Apagbala*	Early maturing, brown eye	CRI	Ghana	No	CRI-Ghana
	Brown eye*	Early maturing, white seed coat	CRI	Ghana	No	CRI-Ghana
	Bengpla*	Early maturing,	CRI	Ghana	No	CRI-Ghana
	Bawutawuta*	Striga resistant	CRI	Ghana	No	CRI-Ghana
	Omondoo*	Drought resistant, cooks faster	CRI	Ghana	No	CRI-Ghana
Zimbabwe	CBC1			Zimbabwe	No	Commercial Seed companies
	CBC2			Zimbabwe	No	Commercial Seed companies
	IT 18			Zimbabwe	No	Commercial Seed companies

Table 6e. Groundnut varieties used in adaptive research and dissemination campaigns, their characteristics, origin and source of seeds by country. *denotes varieties used only in dissemination campaigns.

	Variety	Important traits	Origin	Where (pre)released?	TL-II variety?	Source/obtained from
Nigeria	SAMNUT 21	High pod and haulm yield, Medium maturing, dual-purpose (fodder and grain), resistant to rosette, high oil content (51%)	IAR	2001	No	IAR
	SAMNUT 22	High pod and haulm yield, medium maturing, dual-purpose (fodder and grain), resistant to rosette	IAR	2001	No	IAR
	SAMNUT 23	Early-maturing, resistant to rosette, high oil content (53%)	ICRISAT	2001	No	ICRISAT
	RMP 12	High yield (pod and ahaulms), resistant to rosette (long duration)	B. Faso	Introduction from B. Faso	No	IAR
	ICIAR BT 19	Extra early maturing and resistant to rosette	ICRISAT/IAR	Pre-release in Nigeria	Yes	Identified from TLII PVS
	ExDakar	Still popular but highly susceptible to rosette	IRCHO/CRA Bamabey Senegal	Introduction	No	IAR
Ghana	Chinese*	Early maturing, good taste, high oil content	Ex china	Ghana	No	CRI- Ghana
	Manipinta*	high yield, good taste, high oil content	CRI- Ghana	Ghana	No	CRI- Ghana
	Nkatiesari*	leaf spot resistant, high yielding	CRI- Ghana	Ghana	No	CRI-Ghana
Zimbabwe	Nyanda					

Malawi	ICGV-SM 01708	Medium maturing (110-120 days, high yielding (>2 t/ha, resistant to rosette	ICRISAT-Malawi	Malawi	Yes	ICRISAT- Malawi
	ICGV-SM 01731	Medium maturing (110-120 days), high yielding (>2 t/ha), medium seed size, resistant to rosette	ICRISAT-Malawi	Malawi	Yes	ICRISAT- Malawi
	ICGV-SM 01514	Early maturing (90-100 days) high yielding (1.5 t/ha), resistant to rosette	ICRISAT-Malawi	Malawi	Yes	ICRISAT- Malawi
	ICGV-SM 03572	High yielding (>1.5 t/ha), Early maturing (90-115 days), tolerant to rosette	ICRISAT - Malawi	Malawi	Yes	ICRISAT – Malawi
	Chalimbana	large seeded, susceptible to rosette, long duration (140-150days,Prone to end season drought	ICRISAT Malawi	Malawi	Yes	ICRISAT – Malawi
	Malumba	Local check Early maturating, susceptible to rosette	Local landrace	Malawi	No	
Mozambique	Mamane		IIAM	Mozambique		
	CG7		IIAM	Mozambique		
	Nametil	High yielding, drought and rosette tolerant		Mozambique	Yes	ICRISAT
	ICGV-SM 99658	High yielding, tolerant to rosette	ICRISAT	Malawi, Mozambique	Yes	ICRISAT
	ICGV-SM 99541	High yielding, tolerant to rosette	ICRISAT	Malawi, Mozambique,	Yes	ICRISAT
	JL25-	High yielding, tolerant to rosette	ICRISAT	Malawi Mozambique	Yes	ICRISAT

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List of project documents

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

Partners involved in the N2Africa project

Diobass

Université Catholique de Bukavu

University of Zimbabwe

- **Programme d'appui au developpement durable (PAD) DRC**
- **Service d'Accompagnement et de Renforcement des capacities d'Auto promotion de la Femme en sigle – SARCAF (DRC)**