Demand-led Bean Varieties: the case of SUG131 in Malawi

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Outline

- **Historical Background of Bean Breeding in Malawi**
- **Why SUG131?**
- **Market demand**
- **Evidence of adoption**
- **Innovation and best practice for rapid new variety adoption**

Pan-Africa Bean Research Alliance

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Bean Breeding Background

- **Breeding initiatives - University**:
- Early 1970s – line selection from local landraces; focus – high yield under best agronomic crop management; 1980 -University released : 6 landrace lines; (1993): 2 (1 bred and 1 CIAT) lines
- Note that at this time there was no PVS
- Options for seed production were limited – no private seed companies were involved – limited seed was produced
- Varieties that were known to farmers were Nasaka and Kalima (PVA692) and seed was produced through farmer groups organized by NGOs
- 2005 - 3 bred lines resistance to diseases were released by Bunda

Bean Breeding Background

- **Breeding initiatives – DARS - CIAT**:
- 1994 – DARS bean research started
- Breeding approach was adjusted to include focus farmer production systems (stress conditions) and farmer selection criteria (consumer preferences)
- 1996: 6 CIAT lines were released for yield under stress conditions and farmer preferences; various (formal and informal) ways of making seed available were tried – including sales promotion in small seed packs
- Popular varieties were Napilira (CAL143), Maluwa (CAL113) and Sapatsika (DRK57)

Bean Breeding Background

- **Breeding initiatives – DARS - CIAT**:
- Note that by Mid-1990s – anti tobacco campaigns had intensified and Malawi needed to diversify its export base – legumes were an option – sugar bean was the favorite
- 2000: PABRA bean market-led breeding strategy was developed and PVS was adopted
- 2002: DARS released 2 CIAT lines for specific market classes (sugar and navy)
- 2009: DARS released 3 CIAT lines (1 sugar and 2 calima but with high Fe and Zn content)
- By this time various players in the seed sector were getting interested in bean seed
- The most popular variety is SUG131 (kholophete)

Bean Breeding Background

Breeding initiatives – DARS - AGRA:

- 2005– DARS bean research for bruchid resistance started – PhD study
- 2011: 7 Bred lines released (6 red kidney and 1 pink)
- Seed production to make the varieties widely known – is picking up

Breeding expert

- **3 Bean Breeding programs:**
- i. University – Bean-Cowpea CRSP-CIAT – 1970s
- ii. Department of Agric. Research – CIAT-PABRA -1994
- iii. Department of Agric. Research – AGRA - 2007

Why SUG131?

- It is a modern variety and was introduced into Malawi in the last 12 years and later in Zimbabwe and Mozambique
- It has gained popularity among farmers in Malawi and other African countries - Mozambique and Zimbabwe

Why SUG131?

- **Its selection criteria was based on both: a) consumer (market preference) and 2) agronomic (yield, diseases resistance and adaptation to low soil fertility) traits**

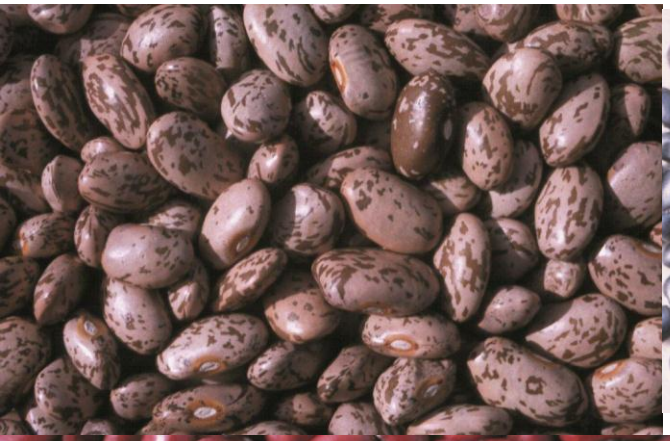
Market demand

- Demanded for export market mainly to South Africa, but also to Zimbabwe, Swaziland, Namibia, Lesotho, Botswana and Mozambique
- As well as local market

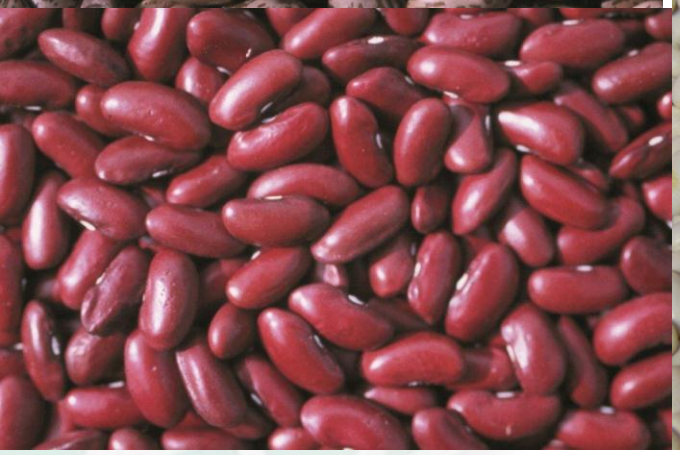
Evidence of adoption

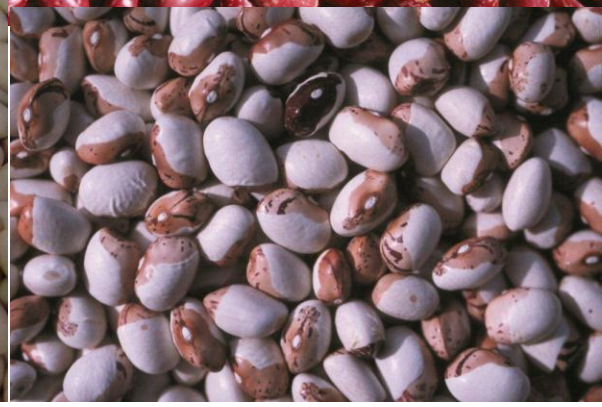
- It has very high preference in Malawi, among the farmers that have grown it – 70% liked the variety and keep growing - Rubyogo et, al. (in press)

Innovation and best practice for rapid new variety popularity









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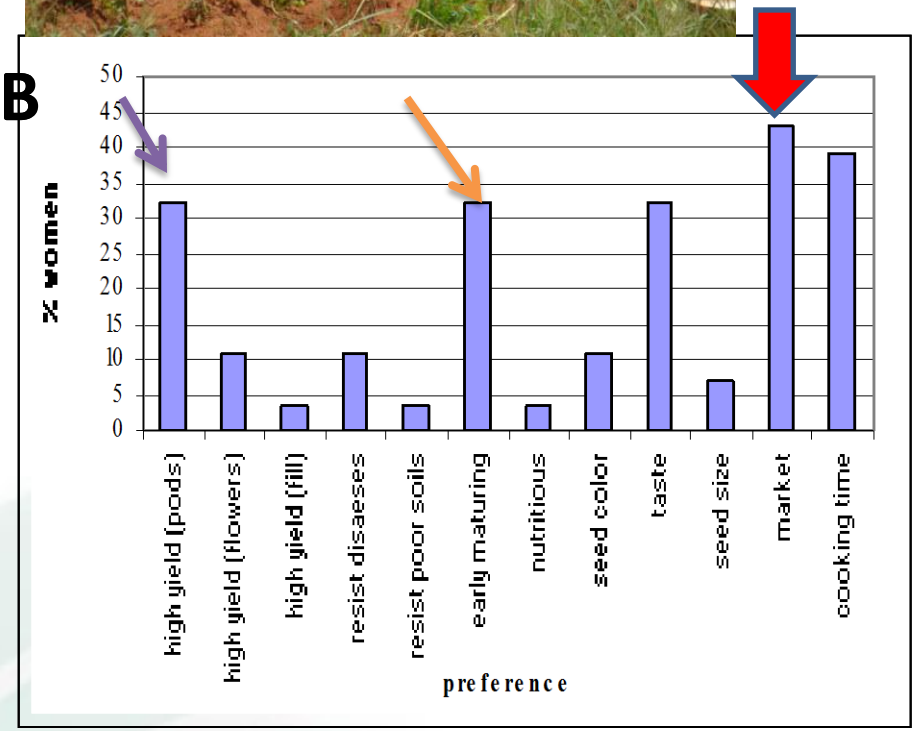

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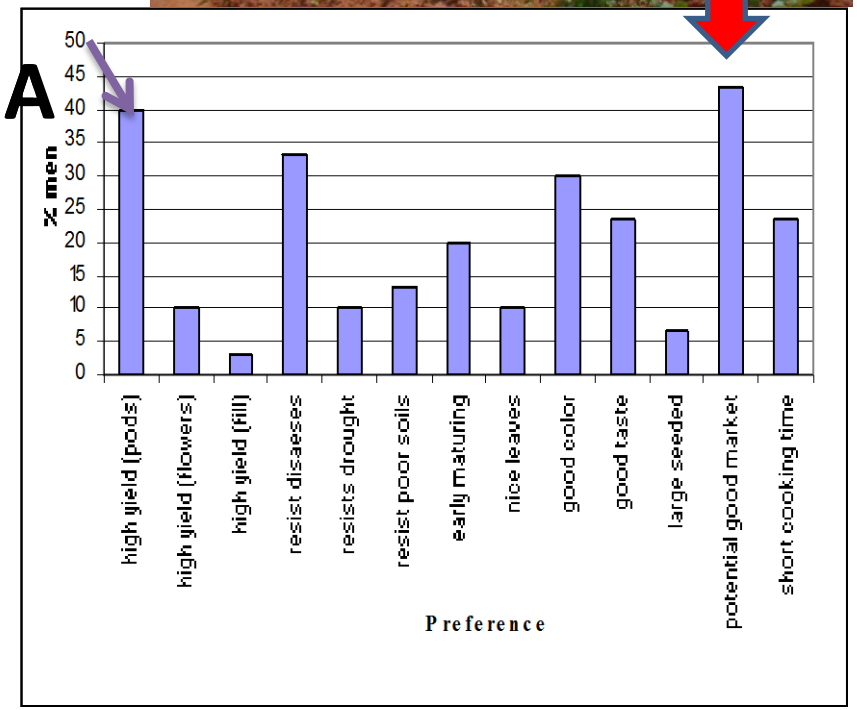
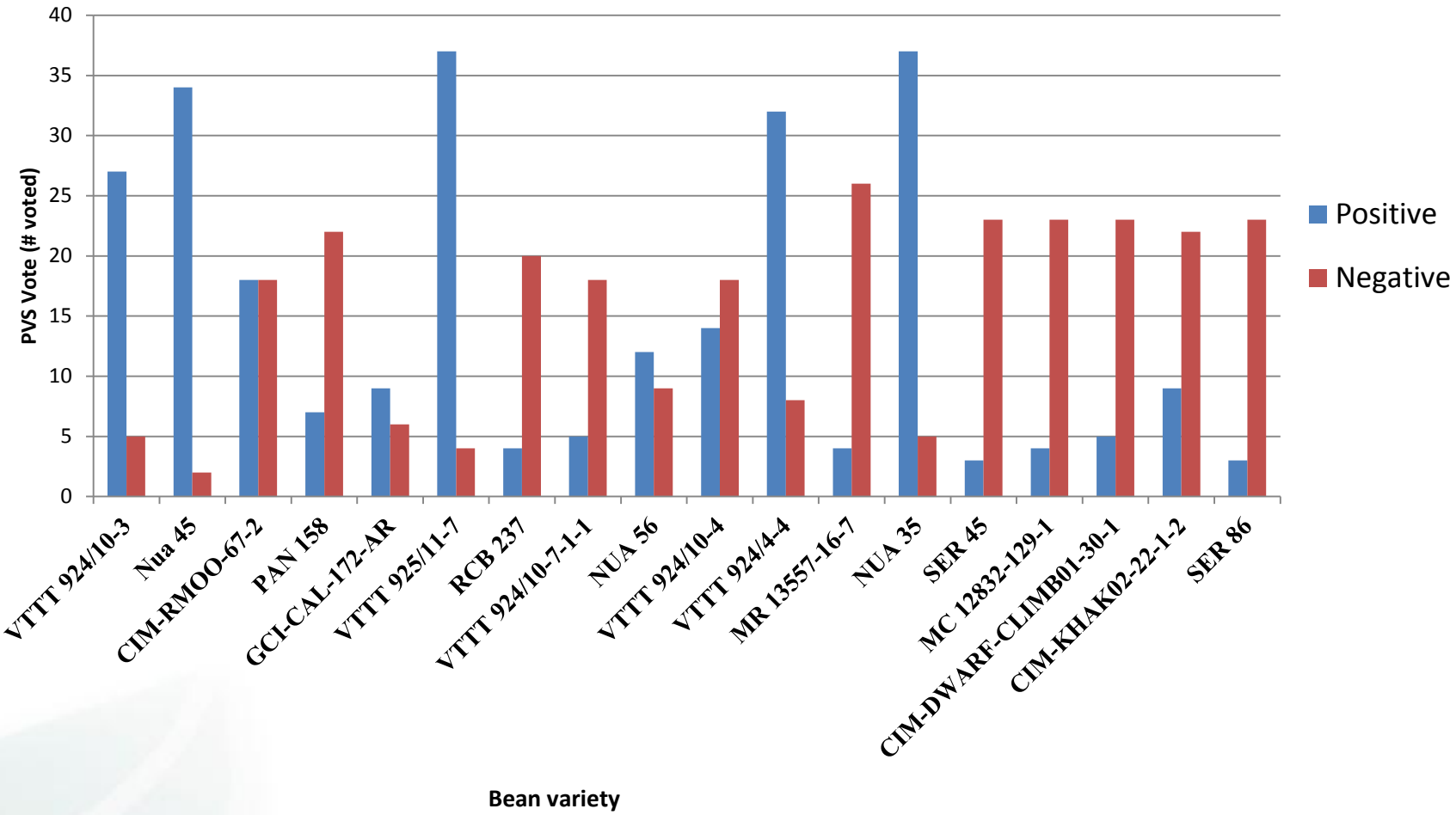
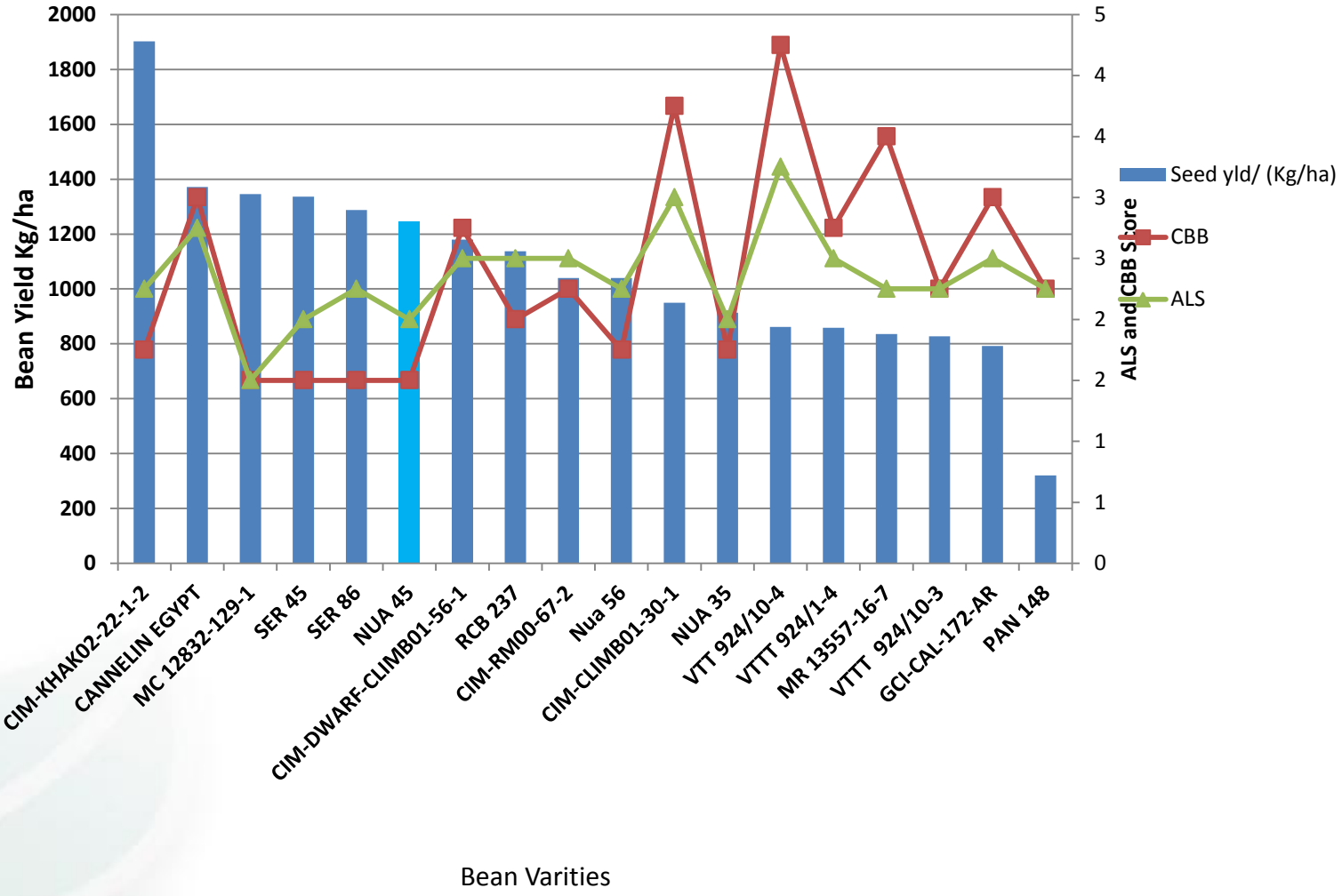


Commonly used criteria for selecting most preferred bean varieties by men (Graph A) and women (graph B) across the sites where participatory variety selection was conducted



Farmer perceptions of bean varieties evaluated under PVS

Participatory Variety Selection (PVS)



Yield performance and reaction to diseases of the bean varieties at one of the sites in Malawi in the 2012-2013 Season

Innovation and best practice for rapid SUG131 popularity

- The driver was – the market demand from South Africa because SUG131 meets the quality criteria of consumers
- Initially, it was the entrepreneurialism of an individual business man (Dimitri Giannakis), linked to:
  - Farmers' World
  - Agora
- The catalyzed scale of production was to fill shortfalls of sugar bean supply in South Africa – before the China supply season

Innovation and best practice for rapid new variety adoption

- Government interventions to support legumes for export market – diversifying from tobacco
  - Various government supported programs and the issues this raises for open vs. managed markets:
  - Agricultural inputs program
  - Presidential initiative on

Government interventions to support legumes to substitute tobacco export

Large demand for seed for several initiatives:

- **Presidential initiative**
- **Green belt initiative**
- **Farm input subsidy program**
- **Seed companies**
- **Individuals**

Seed multiplication initiatives 2012-2013

COMPANY	Crop	VARIETY	No. OF SAMPLES	QTY (Mt)	QTY TESTED (Mt)	QTY PASSED (Mt)	QTY FAILED (Mt)
SEEDCO	Beans	Kholophethe	26	92.3	92.3	92.3	0
		Napilira	2	0.0	0.0	0.0	0
PANNAR	Beans	Napilira	1	2.2	2.2	2.2	0
		Pan148	2	7.3	7.3	7.3	0
DEMETER	Beans	Kholophethe	39	138.3	138.3	138.3	0
		Napilira	8	14.4	14.4	14.4	0
		Maluwa	1	3.0	3.0	3.0	0
		NUA 45	1	0.1	0.1	0.1	0
CPM	Beans	Kholophethe	1	0.6	0.6	0.6	0
PECOCK	Beans	Kholophethe	5	67.0	67.0	67.0	0
DEMETER	Beans	VTT Demeter	1	0.1	0.1	0.1	0
		Maluwa	5	7.1	7.1	7.1	0
		Kholophethe	3	11.9	11.9	11.9	0
		Napilira	2	1.2	1.2	1.2	0
		NUA45	6	1.1	1.1	1.1	0
		NUA59	3	0.3	0.3	0.3	0
		KK25	2	3.2	3.2	3.2	0
		KK25A	1	0.0	0.0	0.0	0
		KK25B	1	0.7	0.7	0.7	0
ASSMAG	Beans	Napilira	2	12.2	12.2	12.2	0
		Kholophethe	1	0.3	0.3	0.3	0
INDIVIDUALS	Beans	Kholophethe	9	7.0	7.0	7.0	0
		Napilira	3	12.9	12.9	12.9	0
		NUA45	1	0.1	0.1	0.1	0
		Nagaga	1	1.0	1.0	1.0	0
		Maluwa	1	0.8	0.8	0.8	0
Total			128	384.8	384.8	384.8	

Seed multiplication initiatives 2013-2014

Producer	Bean Variety	Producer type	Seed crop Type	QTY TESTED (Kg)	QTY PASSED (Kg)
Seed CO	Kholophethe	Private	Certified	92258	92258
Seed CO	NAPILIRA	Private	Certified	26	26
Pannar Seed	NAPILIRA	Private	Certified	2184	2184
Pannar Seed	Pan 148	Private	Certified	725	725
DEMETER	Kholophethe	Private	Certified	138343	138343
DEMETER	Kholophethe	Private	Basic	14428	14428
DEMETER	Napilira	Private	Certified	295	295
DEMETER	NUA 45	Private	Basic	50	50
INDIVIDUALS	Kholophethe	Farmer	Certified	6980	6980
INDIVIDUALS	NAPILIRA	Farmer	Basic	12850	12850
INDIVIDUALS	NUA 45	Farmer	Basic	137	137
INDIVIDUALS	NAGAGA	Farmer	Basic	1000	1000
INDIVIDUALS	Maluwa	Farmer	Basic	750	750
ASSMAG	NAPILIRA	CBO	Certified	12150	12150
ASSMAG	Kholophethe	CBO	Certified	250	250
ICRISAT	Kholophethe	CGIAR	Certified	4750	4750
Peacock	Kholophethe	Private	Certified	66983	66983
Peacock	Nagaga	Private	Certified	11050	11050
CPM Ent.	Kholophethe	Private	Basic	584	584
CPM Ent.	Kholophethe	Private	Certified	9100	9100
CPM Ent.	KK25-Maluwa	Private	Basic	675	675
CPM Ent.	Sapatsika	Private	Basic	970	970
Up-Scaling	NUA 45	Public	Basic	610	610
Up-Scaling	Kholophethe	Public	Basic	417	417
EXAGRIS	VTTT924/4-4	Public	Basic	97	97
EXAGRIS	Maluwa	Public	Basic	7096	7096
EXAGRIS	Kholophethe	Public	Basic	11869	11869
EXAGRIS	Napilira	Public	Basic	1247.5	1247.5
EXAGRIS	NUA45	Public	Basic	1089	1089
EXAGRIS	NUA59	Public	Basic	288	288
EXAGRIS	KK25	Public	Basic	3219.5	3219.5
EXAGRIS	KK25A	Public	Basic	25	25
EXAGRIS	KK25B	Public	Basic	665	665
			TOTAL	403161	403161

Breeder's bean seed produced in the 2013-2014 cropping season at Chitedze

Bean Variety	Planted (seed in Kg)	Harvested (Seed in Kg)
NUA 56	25	146
Kholophethe	70	640
Maluwa	30	250
Napilira	40	200
NUA 45	80	1055
NUA 59	20	76
VTTT924/4-4	15	123
VTTT924/17-2	10	69
VTTT924/11-7	10	43
VTTT924/10-4	4	37
NUA 35	4	29
PAN 148	2	7
Sapatsika	2	8
Kabalabala	1	12