

**PROJECT R8227 [FTR PART 3]**  
**APPENDIX 2: Activities in Malawi**

During the 2002/03 cropping season, two cassava local collections were made. The first collection was planted at Chitedze and Baka Research Stations during the rainy season but due to its poor performance, a second collection was made and planted at Baka Experimental Station in May 2003. Baka is located close to Lake Malawi near Karonga town [460 m.a.s.l.] which has a high incidence of CBSD and CMD.

During the 2003/04 cropping seasons the collections were planted again in a replicated trial at Baka Experimental Station. The objectives were to identify local landraces (genotypes) that are resistant/tolerant to Cassava Brown Streak disease (CBSD). One hundred and nine landraces, mostly from previous collections maintained at Chitedze and Baka and additional ones collected by Baka staff, were put in the trial. The trial is replicated three times, with single rows of 10 plants per plot. Only apparently CMD and CBSD-free plants were used as planting material.

At the time of assessment (July 2004) the plants were over 2 m tall and had started shedding leaves. Most of the genotypes had collapsed to CBSD and CMD (Table 1). CMD was so severe (class 4-5) in most genotypes that in some cases, the expression of CBSD was masked. Some genotypes that seem to be tolerant to CBSD (class 1) may not necessarily be so only that the leaf symptoms could not be ascertained due to the overriding expression of CMD symptoms. The data should therefore be looked at with caution. Tabulated results are presented in Appendix 2.

Apart from the improved varieties like *Sauti*, *Mkondezi* and *Maunjili* (incorporated as improved resistant to CMD checks) most genotypes succumbed to CBSD and CMD. Like in the old site, some genotypes succumbed so heavily to CMD such that leaf expression of CBSD could not be clearly ascertained. However, some local germplasm such as *Banga*, *Tukuyu* (most likely from Tanzania), *Masoghabazungu*, *Mpuma* and *Chitembwere* seemed to tolerate both CBSD and CMD better than the other genotypes. *Banga* is a local variety grown by farmers around Mkondezi, in Banga area. The variety is likely to be from improved source among the clones tested on-farm at Banga by Mkondezi Research Station and not selected but retained later by farmers. This may also explain why it is named after Banga village.

These results suggest that use of improved varieties is the best means of controlling CBSD and CMD in the short term as these have already been screened for tolerance against these diseases. However, there is also potential in use of local varieties in the long run but more work is required. It is important therefore that while efforts are being made to identify CBSD-tolerant local varieties, the use of the already released improved varieties which show considerable tolerance to CBSD and CMD should be promoted for growing by farmers.

**Table A2.1. Severity and incidence of CBSD and CMD in Local germplasm established in May 2003, Malawi.**

Variety	CMD		CBSD	
	Score	Incidence	Score	Incidence
<b>BLOCK I</b>				
Mchilingano	4	100	1	0
Nyasungwi	4	50	3	50
Makhwekhwere	4	83	1	0
Gado	4	100	1	0
Masangwi	4	100	1	0
Muyaya	4	55	2	36
Manyokola	4	36	2	18
Romani	4	40	3	10
Gwalangwa II	4	63	2	25
Mosambique	4	38	2	38
Gwalangwa I	4	80	2	10
Manyopola	4	100	2	50
Six months	5	100	4	36
Maloya	5	50	2	25
Nyasungwi A	5	82	1	0
Nyamakozo	4	36	3	45
Agriculture	4	100	2	20
Chimphuno	5	100	1	0
Ngw'enyani	5	100	2	30
Nyatheweta	4	91	2	27
Gomani Mtuwa A	4	55	3	82
Benga	4	18	2	30
Nyankhata	4	27	2	64
Balaka	4	63	1	0
Nyachikundi	4	91	2	27
Mpuma	3	36	2	18
Gomani Mfipa	4	67	2	50
Banga	1	0	1	0
Nyaharawa	4	100	2	43
Kanonono	4	82	2	45
Gomani	4	45	2	27
Mpuma A	4	10	1	0
Depwete	4	73	1	0
Depwete A	4	73	1	0
Research	4	73	2	55
Manyokola B	4	100	1	0
Kaligonje	5	82	1	0
Mwandilawa	5	100	1	0
Mwaya	4	100	2	27
Kabuthu	5	100	2	18
Matuvi	5	100	1	0
Nakalasi	4	91	3	45
Mpapa	4	55	1	0
Kajalajata	4	55	2	9
Manyokola BA	5	100	1	0

Variety	CMD		CBSD	
	Score	Incidence	Score	Incidence
Nzonda	5	100	1	0
Chilinkhano	4	60	1	0
Dzalamaenje	5	100	2	20
Mulanje	1	0	1	0
Chithekere	4	100	3	70
Mpira	3	20	1	0
Kachamba	5	100	2	45
Mkhalatsonga	4	100	1	0

<b>BLOCK II</b>				
Gado	4	78	1	0
Masangwi	4	89	1	0
Muyaya	4	44	1	0
Manyokola	4	100	1	0
Romani	3	22	2	22
Gwalangwa II	4	82	3	44
Mozambique	2	10	1	0
Gwalangwa I	3	100	3	30
Manyokola	5	91	2	70
Sixmonth	5	100	1	0
Maloya	4	100	1	0
Sixmonth	5	100	2	27
Nyasungwi A	4	83	1	0
Nyamakozo	4	60	2	40
Balaka	5	100	1	0
Agriculture	4	100	1	0
Nyakundi	4	100	1	0
Gomani Mtuwa	4	100	1	0
Nyakhata	4	100	1	0
Nyabarawa	5	100	1	0
Gomani	4	100	1	0
Mpuma A	3	22	1	0
Dephwete	4	100	3	100
Research	3	45	1	0
Manyokola B	5	100	1	0
Kaligonje	4	100	1	0
Mwaya	4	100	1	0
Mwandilawa	4	100	1	0
Kabuthu	5	100	1	0
Nakalasi	5	100	1	0
Manyokola BA	4	100	1	0
Kajalajata	4	100	1	0
Mpira	3	50	1	0
Kachamba	4	100	1	0
Chithekere	4	100	2	18
Kasantha	4	82	2	64
Mbundumale	5	70	1	0
Koloweka	4	64	2	30

Masoyabazungu	2	11	1	0
20:20	4	55	3	45
01/1144 PYT	1	0	2	36
01/1383 PYT	1	0	2	25
Chitembwere	4	82	1	0
Kasisi	5	83	2	17
Unknown (Mlale)	4	82	3	64
Chitembwere Kapantha	4	33	1	0
Chitembwere	3	50	1	0

<b>BLOCK III</b>				
Nyandovi	4	89	2	44
Chiswanthema	3	55	3	91
Mulakata	3	100	1	0
Kwasakwasa	4	91	1	0
Nyakafupi	5	100	1	0
Nyamphande	3	70	1	0
Matakolebwende	4	91	1	0
Kamphuno bii	4	67	2	22
Buyibuyi	3	22	1	0

**Table A2.2. Severity and incidence of CBSD and CMD in local germplasm established in 2003/04 cropping season**

Variety	CBSD		CMD		Remarks
	Score	Incidence (%)	Score	Incidence (%)	
Gomani	2.7	66	4	69	
Kasantha I	2	48	4	57	
Nyamphuto	2.3	13	4.7	100	
Mpuma	2	25	4	35	
Maunjili	1.7	27	4	87	
Mpira li	1.7	20	4.7	93	CBSD masked by CMD
Mangochi	2	50	4.3	100	
Unknown	2	36	4	86	
Gomani Mtuwa	2.3	53	4.3	70	
Mbawala	1.7	35	4.3	89	
Tukuyu	1	0	2.7	55	
20-20	2.3	70	4	94	
Mkodi	1.7	7	4	93	
Dzalamaenje	1.3	13	4.7	100	CBSD masked by CMD
Gomani Mfipa	2.7	36	4.7	83	CBSD masked by CMD
Nyantheweta	1.3	4	4	86	
Mteka	1.3	54	4.7	100	CBSD masked by CMD
Maloya	1.7	33	4	87	

Kolobeka	2.3	53	4	92	
Mbundumali	2	21	5	100	
Six Months II	1.3	4	5	100	CBSD masked by CMD
Fyoka	2.3	28	4.3	58	
Six Months I	1	0	5	100	
Kasantha II	3	58	4.3	88	
Unknown Sekelemni	1.3	3	4.3	83	
Nakalasi	1.7	13	4.7	93	CBSD masked by CMD
Chimphuno	2.7	78	4.3	83	
Unknown 8	2	24	4	96	
Phwakatu	1.7	10	4	97	
Munyakayuni	1.7	4	4	68	
Matakolembwende	1.3	11	4	96	
Mwandilawa	1.7	17	4	100	
Nachisalanza	2.3	28	5	100	
Beleladona	2.3	27	4	87	
Nyasungwi A	1.7	26	4.7	100	
Mkhalatsonga	2.3	38	4.7	89	
Lizuwa	3	77	4.7	100	
Unknown Mlale	3	86	4.3	80	
Gwalangwa	2.7	61	4	59	
Chitembwere Mtuwa	2.3	95	4	100	
Koloweka li	2.7	43	4.3	70	
Mbundumali	2.7	60	5	96	
Alupwana	2.3	30	4.7	80	
Kachamba	2.3	40	4.3	100	
Mpapa	2.3	15	4.7	100	
Nyahalawa	1	27	3	56	
Masoghawazungu	1.3	17	2.7	67	
Sekelemani	1.7	13	4	97	
Tanzania	1.7	15	4.7	96	
Depwete	2	15	4	67	
Kamphunobii	2.7	61	4.3	72	
Banga	1.7	28	1	0	
Buyibuyi	2	22	4	58	
Kajalajata	3.7	96	1	33	
Simalikande	2	47	3.7	79	
Nyamphande	1.3	6	4.3	100	
Mpira I	2	19	4.7	92	
Benga	2	35	4.3	52	
Zambiya	1.7	24	4.3	100	
Nyautonga	1	0	4.3	89	
Nyamalonje	1.3	7	4.7	69	
Kasungwi	1	0	4.7	84	
Kaligonje	1.7	24	4.7	100	
Kamwalikaving'unu	3	89	3	14	
Balaka II	1.3	7	5	100	
Mtutumusi	2.7	56	4.7	63	
Bwanali	2	22	4.3	100	

Sauti	1	0	1	0	Improved, released variety
Thipula	1.3	11	4.3	100	
Cadecom	1.7	18	5	95	
Manyokola	1.7	13	4.3	100	
Chithekere I	1.3	19	4	97	
Chiswanthema	1.7	11	4	100	
Kwasakwasa	2	37	4.7	100	
Palamu	1.3	13	4.7	79	
Mosambique	2.7	57	3.7	48	
Nyachikundi	2	16	4	56	
Nyandovi	2.7	81	4	33	
Matuvi	0.3	0	1.3	33	
Nyainki	1	0	4	64	
Balaka	1	0	4.7	90	
Azungu	2	24	4.3	86	
Guguza	2.3	29	4	91	
Kanonono	2	17	4	83	
Makhwekhwere	1.3	3	4.7	78	
Mkondezi	1	0	3.7	28	
Mwaya	2.7	74	5	100	
Muyaya	2	33	4	80	
Lolesi	2.7	75	4.3	96	
Gado	2	39	4	100	
Chithekere	2.3	36	3.7	62	
Ngw'enyani	3.3	69	4.3	93	
Masangwi	2.3	50	4.7	93	
Bitilisi	2.3	57	4	64	
Nzonda	2.3	25	4.3	85	
Nyamakozo	1	0	4	42	
Boma	1.3	4	3.7	57	
Romani	2.3	100	3.7	56	
Nyankhata	2.3	19	4	41	
Kabuthu	2.3	31	4.7	100	
Chitedze	2.3	56	4	90	
Chimdini	1.3	10	4	100	
Chitembwere Kapantha	1	0	4	71	
Agriculture	2	43	4	67	
Yoyela	1.7	8	4.7	100	
Sokalagalu	2.3	83	4	34	
Chitembwere	1	0	3.7	27	
Masoghawahindi	1	0	4	59	
Chilinkhano	1.3	14	4.7	100	

**Most promising entries over two seasons:**

[Entries resistant to both CBSD and CMD and entries resistant only to CBSD]

1. Resistant to CBSD and CMD over both seasons

Banga

2. Resistant to both diseases in 2003 but not planted in 2004

Mulanje

3. Resistant to CBSD in both seasons

Balaka

Chitembwere Kapantha

Chitembwere

Masoyabazungu

4. Resistant to CBSD in 2004 but not planted in 2003

Tukuyu

Nyautonga

Nyaninki

Masoghanawahindi

Improved varieties included as resistant checks

Mkondezi

Sauti

International checks

TMS 42025 [highly susceptible to CBSD]

TMS 30001 [less susceptible to CBSD]