

## **Selection of Climbing Bean Lines Tolerant to Common Bacterial Blight, Bean Common Mosaic and Web Blight**

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### **Introduction**

Climbing beans offer a new opportunity for increasing bean yields in East and Central Africa because of their high yield potential. Improved climbing beans were introduced by CIAT to the Great Lakes region (Rwanda, DR Congo and Burundi) in the late 1980's. They were rapidly adopted in this region because of traditional experience with climbing bean landraces. Improved climbing bean cultivars are attractive to farmers because of their high yield potential of 3:1 compared to bush cultivars in favourable environments. Climbing beans are particularly important in areas with high population pressure due to declining availability of arable land. They spread rapidly from Great Lakes region to Kenya and Uganda in the early 1990's. They are now being experimented with in nearly all nine countries comprising the East and Central Africa Bean Research Network (ECABREN). However, the expansion of climbing bean technology is threatened by diseases especially root rots, bean common mosaic, anthracnose, angular leaf spot, common bacterial blight and ascochyta. For example, Umubano which was released in Rwanda and Uganda, and is widely adopted in Western Kenya, is susceptible to fusarium wilt and bean common mosaic virus. As a result, many farmers in Rwanda stopped growing it. Cultivars resistant to these important diseases are required to stabilize production. The objective of this study was to screen a regional climbing nursery for disease resistance.

### **Materials and Methods**

Seventy-five climbing bean lines were screened for disease resistance at the Kenya Agricultural Research Institute (KARI) station in Ol Jorok during 2001 and 2002. Ol Jorok (2350 masl) is a 'hotspot' for several bean diseases (bean common mosaic virus, anthracnose, angular leafspot, web blight, ascochyta and halo blight). The site has a uni-modal rainfall pattern starting in April/May with a peak in August. Soils are moderately fertile. The test lines originated from DR Congo (45), Rwanda (4) and CIAT (25). Each entry was sown on two, 5 m rows. Plants were staked to 2 m at two weeks after germination. The trial was replicated twice. The entries were rated at flowering (R6) and at mid-pod fill (R8). Disease assessment was based on natural epiphytotic. CIAT scale was used for disease rating.

### **Results and Discussion**

Conditions were favourable for development of common bacterial blight, bean common mosaic (BCMV) and web blight. Some characteristics of the 26 lines selected for resistance to one or more diseases and vigour are shown in Table 1. Duration to flowering varied from 57 days for Nakaja to 94 days for G 50330. Thirteen of the selected lines were small seeded, 7 medium and 6 were large seeded. Twenty-five of 75 lines were rated resistant to common bacterial blight. Five of the lines susceptible to common bacterial blight failed to produce any seed. Thirty-three lines

were susceptible to BCMV. Both Umubano and Vunikingi, regionally popular cultivars, were susceptible to BCMV. Thirty-four lines were resistant to BCMV. Eight showed intermediate reactions. Six test lines were susceptible to web blight; 4 showed intermediate reactions and 65 were resistant. Disease pressure for anthracnose, ascochyta and halo blight was low and for angular leaf spot was moderate. MLV76/97A and A235 were susceptible to angular leaf spot. All other materials showed intermediate to resistant reactions to angular leaf spot. In 2002, most of the lines were destroyed by frost. These results indicate potential new sources for resistance to BCMV, common bacterial blight and web blight.

**Table 1.** Duration to 50% flowering, seed size, grain type and reaction to bean common mosaic virus, web blight and common bacterial blight of 26 climbing bean lines selected at Ol Jorok in Kenya (2001-2002).

Line	Days to flowering	#Seed size	Grain type	*CBB	*BCMV	Web blight	Other observations
MLV 59/97A	72	M	sugar	5	2	4	
MLV 76/97A	63	S	brown	1	1	2	
Kirundo	76	L	yellow	1	7	1	ALS susceptible
VCB 87012	70	M	brown	1	1	1	
Nakaja	57	S	brown	1	5	1	vigorous
AND 10	85	L	sugar	1	1	1	vigorous
VCB 81012	61	S	brown	1	7	1	
M'Sole	76	S	brown	1	2	2	
AFR 441	71	M	zebra	1	1	3	
MLV 198/97A	71	S	zebra	2	1	3	
MLV 6/90B	71	S	brown	1	1	9	
MLV 222/97A	69	S	white	1	1	1	vigorous
MLV 56/96B	62	S	brown	1	5	1	
MLV 227/97A	63	S	brown	1	1	1	
MLV 216/97A	85	S	black	1	1	1	
Cuarentino 0817	63	S	white	1	1	1	
SEQ 1006	70	L	zebra	1	3	4	
G59/1-2	71	L	brown	2	7	1	
Naindekyondo	76	S	white	1	2	1	
G50330	94	M	brown	1	2	1	
G24517	76	M	yellow	3	1	1	
G20875	86	L	brown	1	7	1	
Gisenyi	91	L	sugar	1	2	1	
G20833	85	S	black	3	9	1	
G31479	76	M	black	2	7	1	
G20751	84	M	yellow	2	7	1	

# Seed size: S= small (< 25g/100 seeds), M= medium (25-39 g/100 seeds) and L=large (> 40 g/100 seeds)

\* CBB= common bacterial blight, ALS= angular leaf spot and BCMV= bean common mosaic virus).