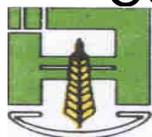




# COWPEA (*Vigna unguiculata* (L.) Walp.)“ in Angola



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## Modern Cowpea Breeding to Overcome Critical Production Constraints in Africa and the US.

### ABSTRACT

When the Portuguese came to the Congo Kingdom /North of Angola as its inhabitants had a sedentary life, characteristic of societies that use agriculture (Pigafetta, 1591).

As for legumes, the history of the Kingdom of Congo (Bibl.Vat) cites the peas and other grains. The peas should be the fruit "*Cajanus cajan* Druce," but Cavazzi (Century XVII-XVIII) recognized it as "ukase", likely to be cowpeas (*Vigna unguiculata* (L.) Walp.).

The first Europeans who visited the Cunene, in the mid-nineteenth century, found agriculture traditionally practiced in Cuanhama, which was based on cereal, millet (*Pennisetum* sp.), cucurbits and legumes. Two of these were traditional legumes, Bambara groundnuts (*Vodzea subterranea*, *Vigna subterranea*) and cowpeas. The cowpeas were so important that their local name was given to a land border with Namibia: Namaconde.

In Angola, cowpeas express greater ruggedness and lower requirements for moisture than other crops. The longterm interest in cowpeas goes beyond the scope of the small farmer, given its characteristic as a nitrogen fixing plant, and thus the benefit of including it in rotation cotton, sunflower and sugar cane. Today, cowpea is grown throughout the country, albeit with greater relevance in the ecological zones of medium altitude and relatively warm, semi-arid areas (Bengo, Cuanza Sul, C. Norte, Benguela, Namibe, Zaire, Cunene, Huila, Cuando Cubango).

### INTRODUCTION

From 1970 to 1992 IIA, Angola conducted trials with cowpea breeding lines distributed by International Institute of Tropical Agriculture (IITA), Nigeria. At that time, considerable progress was made in cowpea breeding, and a range of varieties were developed, combining diverse plant type and maturity with resistance to several diseases. Small farmers still grow these cowpeas introduced from IITA, mixed with local landraces of cowpea. Cowpea landraces in Angola have not been collected widely, even though it has one of the richest bean germplasms in southern Africa. The IIA lost its big GeneBank in 1994. However, in the last 10 years the "Centro Nacional de Recursos Fitogenéticos" (CNRF) has increased the number of cowpea germplasm accessions. Presently, the GeneBank of the CNRF contains about 500 cowpea. Since 2007 the IIA-Cowpea Research Project has been supported by the funds from CRSP/USAID through Michigan State University and implemented by University of California, Riverside.

### MATERIALS AND METHODS

During the last 5 years the cowpea project has conducted fields trials at the following IIA Stations (average rainfall and temperature/crop cycle): Bengo (100 mm, 27°C), Huambo (1400 mm, 19°C) Cuanza Sul (1200 mm, 21°C), Benguela (1400 mm, 23°C) Huila (1100 mm, 18°C). In Mazozo/Bengo cowpea has been planted under irrigation conditions, whereas at other Stations cowpea is grown in the rainfed season. We evaluated 28 lines provided from UCR and 10 landraces of cowpea, in CRBD with four replications. Each treatment/plot was a single row 4 m in length, 1 m between rows, 1 m between each hole within the row and 2 seeds/hole, without fertilizer application. Each row/line was evaluated for stand, vigor, growth habit, time to 50% maturity, disease incidence, adaptation, grain color and yield. Analysis of variance (LSD 0.05) was conducted using ASSISTAT Version 7.6 beta. Cowpea samples were collected in the field trials planted at the four IIA-Experiment Stations and from fields of small farmers. Symptom recognition and disease identification followed the method of Fernandes (1983), conducted at the Plant Pathology laboratory/IIA in Huambo by using a compound microscope.

### RESULTS

In Mazozo four CRSP lines, CRSP NIBE, IFE BROWN, IT84S-2049, and IT90K-284-2 looked superior in terms of germination, vigor, adaptation and yield. The line IT90K-284-2 had more consistent germination than IFE BROWN. Most of the lines germinated poorly or not at all, from the second seeding. In IIA-Station trials where cowpea was grown in the rainfed season no measurable yields were produced. Heavy rainfall increased the incidence and severity of Ascochyta leaf blight which killed plants in several trials, and all varieties were susceptible. However, on the UCR lines, we have not observed the cowpea common diseases described by Fernandes (1983) (Table 2). Evaluation of UCR-cowpea breeding lines and landrace varieties is continuing in regions having the greatest potential for increased cowpea production.

**Table 1. Results of Lines with superior performance.**

Variety	Origin	Growth habit	Flowering/ 50%	Grain Description	Yield kg/ha
CB 27	California (UC Riverside)	Deter/erect	45	Large blackeye	250
CRSP NIBE	Cameroon (IRAD)	Deter/erect	45	Large white	500
IFE BROWN	Nigeria	Deter/erect	45	Medium brown, wrinkled	1000
IT82E-18	IITA-Nigeria	Deter/erect	45	Medium, brown smooth	625
IT84S-2049	IITA-Nigeria	Deter/erect	45	Medium brown eye	625
IT90K-284-2	IITA-Nigeria	Deter/erect	50	Medium, brown smooth	565
LOCAL CHECK	Cassequel market	Deter/erect	67	Medium black	115

**Table 2 Major *V. unguiculata* Walp. diseases in Angola. Fernandes, 1983**

Common name	Causal Agents
Anthraxnose	<i>Colletotrichum lindemuthianum</i> (Sacc.&Magnus) Briosi& Cav.
Ascochyta leaf blight	<i>Phoma exigua</i> var. <i>exigua</i> Sutton & Waterston, (synonym <i>Ascochyta phaseolorum</i> Sacc)
Cercospora leaf spot	<i>Cercospora canescens</i> Ell. G.Martin
Cercospora leaf spot or target spot	<i>Cercospora vignicola</i> Kawa
False rust	<i>Synchytrium dolichi</i> (Cke.) Gaum, syn. <i>Woroninella dolichi</i> (Cke.) Syd.
Powdery mildew	<i>Erysiphe polygoni</i> D. C.
Scab	<i>Elsinoe phaseoli</i> Jenkins
Septoria leaf spot	<i>Septoria vignae</i> Henn.
Web blight	<i>Corticium solani</i> (Pril. & Delacr.) Bourd. & Galz. Syn. <i>Rhizoctonia solani</i> Kuhn.
Zonate leaf spot: <i>Dactulophora tarri</i>	Zonate leaf spot: <i>Dactulophora tarri</i>



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