



## Introducing Cassava into Egypt

By

Sahar A. Sherif and Nagib M.A. Nassar  
Institute of Crops Intensification, Giza ,Egypt and Universidade de Brasilia ,  
Brazilia,Brazil Respectively

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### ABSTRACT

A lot of 1000 cassava seed was introduced by the senior author from Brazil in 1986 to Egypt... Growing plants were subjected to selection through 12 consecutive years, and resulted in selecting two clones that were productive. One of these clones was used here in intercropping trials with groundnut in sandy soil of Northern Egypt region , a typical temperate climate. A high productivity of intercropped cassava was achieved. It reached 21 t/feddan; i.e., 42 t/ha<sup>-1</sup> when planted in spring (April).

### KEY WORDS

cassava productivity , Mediterranean climate, northern Egypt

## INTRODUCTION

Cassava is regarded as one of the most important staple crops and food for about 800 millions people in tropics and sub tropics (FAO, 2007). It contributes to the world food supply in many ways either eaten roots for human and animals or as starch or flour. Cassava starch is used in food industry too.

One of the most fascinating aspects of cassava is that it stands severe and marginal conditions of soil and climate. If it introduced to Egypt, it would have played an important role because of reduced area of land used for cultivation in that country and availability of only reclaimed sandy soil. In addition, there is a high demand of food for both of increased population and animals. The temperate country of Egypt had been considered though an obstacle of its cultivation and its growing in such conditions. Therefore it is the importance of our trial of introducing it and evaluate its adaptation..

Predominant mode of agricultural production in Egypt is small family farms for which intercropping may be the most recommend model. Combing cassava to groundnuts sounds the best way to maximize benefits of using this system.

In case of cassava, the big challenge to gain most profitable harvest and productivity seems to be selecting season and space of cultivation. We present here a trial of evaluating productivity of intercropped the above forementioned cassava clone with groundnut in different seasons and spaces of province Tahrir, northern Egypt..

## MATERIAL AND METHODS

A lot of 1000 cassava seed was introduced by the senior author from Brasil in 1986 to Egypt. Growing plants were subjected to selection through 12 consecutive years, and resulted in selecting only two clones that were productive. One of these clones is being used here in intercropping trials. Two field experiments were carried out at South Tahrir Research Station (Ali Moubarak), during 2004/2005 and 2005/2006 seasons to study the effect of intercropping cassava with groundnut and date of cassava planting on growth, yield and yield components. The treatments used were as follows:

1- date of planting cassava

- cassava stakes were planted on the 15th of March
- cassava stakes were planted on the 1st of April
- cassava stakes were planted on the 15th of April

2- cropping patterns

- cassava was intercropped with groundnut in alternative pattern (1:2)
- cassava was intercropped with groundnut in alternative pattern (1:4)
- cassava or groundnut were grown in pure stand as check

Experimental design

The 12 treatments were laid out randomly in a split-plot design. Check plots were also involved in the replications and devoted only for biological evaluation. Date of planting occupied the main plots, the subplots were devoted for the intercropping treatments. The plot area was 28 m<sup>2</sup> and included 4 rows. Each row was 7 m in length and 1 m in width. Both inter and intra row spacing was 100 cm for cassava. Plant spacing for groundnut was 10 cm apart.

#### Cultural practices

Primary and secondary stakes from cassava were cut into 25 to 30cm in length inserted according to the treatment of planting date in wetty soil at the three dates of planting and intercropping patterns. Irrigation was practiced every day under strip irrigation system during the first two weeks, thereafter, as needed during the season until two weeks before time of harvest.

The stakes were planted vertically by inserting two thirds of the stakes into the soil keeping one third of them above ground, and irrigated immediately after planting. Nitrogen, phosphorus and potassium were applied as recommended. Tuber yield was harvested on 6th and 11th February in both seasons, respectively. One week before harvesting, five guarded plants were taken randomly from each plot to determine the characters.

Groundnut cultivar ‘Giza 5’ was sown in sole and mixed cropping on 22 and 25 May in the first and second seasons, respectively at 10 cm apart. The seeds were inoculated with *Rhizobium* bacteria before sowing and immediately irrigated. Groundnut was harvested after 140 days from seeding.

## RESULTS AND DISCUSSION

Table (1): Effect of planting date of cassava intercropped with groundnut on yield and yield components of cassava in both seasons

2004/2005					
Characters Date of planting	Plant height (cm)	No. of branches /plant	No. of tubers /plant	Weight of fresh tubers/plant (kg)	Yield of fresh tubers t/fed
15th March	150.8	3.1	5.7	4.0	16.3
1st April	132.7	3.3	7.9	5.1	21.0
15th April	117.3	3.7	7.3	4.5	18.7
LSD at 5%	0.82	0.05	0.29	0.21	1.21
2005/2006					
15th March	146.3	2.8	5.1	3.8	15.0
1st April	124.6	3.1	7.3	4.8	20.0
15th April	109.2	3.5	6.7	4.1	17.2*
LSD at 5%	0.71	0.07	0.38	0.16	

Table (2): Effect of intercropping patterns on cassava intercropped with groundnut on

yield and yield components of cassava in both seasons

2004/2005					
Characters Intercropping patterns	Plant height (cm)	No. of branches /plant	No. of tubers /plant	Weight of fresh tubers/plant (kg)	Yield of fresh tubers ton/fed
1:2	128.8	3.7	7.5	4.8	19.7
1:4	138.4	3.0	6.4	4.3	17.6
LSD at 5%	*	*	*	*	*
2005/2006					
1:2	121.5	3.4	6.9	4.5	18.3
1:4	131.8	2.8	5.8	4.0	16.5
LSD at 5%	*	*	*	*	*

Table (3): Interaction effect of planting date and intercropping patterns of cassava intercropped with groundnut on yield and yield components of cassava in both seasons

2004/2005						
characters		Plant height (cm)	No. of branches /plant	No. of tubers /plant	Weight of fresh tubers/plant (kg)	Yield of fresh tubers ton/fed
Date of planting	Intercropping patterns					
15th March	1:2	130.7	3.3	5.1	4.0	15.8
	1:4	135.5	2.8	4.6	3.5	13.5
1st April	1:2	107.8	3.7	7.6	5.6	22.1
	1:4	115.5	3.1	6.3	4.8	19.8
15th April	1:2	88.6	4.0	7.1	4.6	19.3
	1:4	100.7	3.3	6.1	4.1	16.8
LSD at 5%		1.51	N. S	0.33	N. S	N. S
2005/2006						
15th March	1:2	129.3	2.8	4.6	3.7	14.6
	1:4	133.3	2.6	3.7	3.5	12.4
1st April	1:2	103.2	3.3	7.1	5.2	20.8
	1:4	110.0	2.8	5.7	4.4	19.0
15th April	1:2	83.4	3.8	7.0	4.2	17.5
	1:4	97.1	3.1	5.7	3.8	16.0
LSD at 5%		0.62	N. S	N. S	N. S	N. S

There are scarce literature on studies of cassava intercropped with groundnut, far less those focused on introducing it into new area and climate. The same said on evaluation

of its productivity , plant density and spacing in temperate countries similar to Egypt .

With the introduction of introduced cassava new genotype to a new country, précised information of cultivation in different systems are highly required to maximize the economic and biological productivity of cassava.

High productivity of intercropped cassava was achieved when sown in April (Tables 1,2 and 3). This is expected due to increase of temperature begin by this month which reaches maximum in July and August (45°C) corresponding to 4 and 5 months age of cassava. This means that within 7 months, cassava receives during its vegetative growing a temperature from 30°C and rarely be lower(Manrique, 1990).. This range of temperature exactly equal of temperature in Central Brazil.

The best pattern of cultivation occurred under a space 1.4 m between rows with a productivity level of 21 t/feddan; i.e., 42 t ha<sup>-1</sup> (Tables 1,2,3). This productivity is considered a very high level compared to results obtained in Brazil and Africa using groundnut in intercropping. It is also far higher than cassava productivity in Brazil and even in India (Nassar, 2006).

One may highlight from this data , the high productivity of cassava in this intercropping system and in this region compared to what cited frequently in traditional and advanced centers of production like Brazil where it is estimated around 20 t ha<sup>-1</sup> in the best producer centers like Sao Paulo and Parana (Cenpukdee and Fukai, 1992))...

The spacing of 1.4 m is much advantageous than other one, apparently due to simple ease of working with agricultural equipment and implements, reducing cultural practices and production costs consequently (Mason,1986)..

Larger spacing of cassava intercropped with groundnut increases biological productivity of both cassava and adjacent plant due to effect of reduced amount of fertilizers, thus, leading to more rational use of land(Tsay et al.,1988, Mead and Wiley)

Since the competition in the pool of intercropped plants is based on time when competition starts, maximum productivity is gained when minimize period of competition. To reach this, timing of planting each crop considering its growth rhythm and habit is very important(Wiley and Rao, 1980), . In our case April is optimum for planting cassava stalks and sowing groundnut seed.

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