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**INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH  
TECHNOLOGY****INTRODUCTION OF THE WHEAT CROP IN CONGO-BRAZZAVILLE, A  
COMPARATIVE STUDY OF FIVE WHEAT VARIETIES****C.N.M Ebélébé<sup>1</sup>, R.Matondo<sup>1</sup> & T. NSongo<sup>2</sup>**<sup>1</sup>Université Marien NGouabi de Brazzaville, Ecole Nationale Supérieure d'Agronomie et de  
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**ABSTRACT**

In this work, five Indian varieties of Jarissa wheat, SO-126, SO-160, SO-119, SO-78 were selected, tested in India and gave good results. These wheat varieties were then sent to the Congo for adaptation trials. Qualitative and quantitative factors were observed for each variety.

The comparative study of five (05) varieties of wheat has shown that two varieties can be adapted to wheat cultivation in Congo:

The Jarissa variety was found to have the best plant size, the highest number of ears per board and the best yield. The SO-160 variety has the best number of ears per board and the highest number of leaves per stem.

These two varieties of wheat were selected as the best adapted during the test to the conditions of cultivation in Congo Brazzaville.

**KEYWORDS:** wheat varieties, wheat, Jarissa, SO-126, SO-160, SO-119, SO-78.**1. INTRODUCTION**

Soaring world prices and new patterns of urban consumption in Africa make wheat growing, long neglected for maize, again profitable for the continent or the demand explodes (Anne CAHON, 2012). Wheat worth only 200 euros / T in June 2010 in Cameroon, was listed in 2011 in the same country at 320 euros / T (DipitaTongo, 2011).

The staple foods most consumed in Congo and wholly imported from Western European countries, are derived from wheat flour.

This has a negative impact on the purchasing power of citizens.

Emerging countries such as India, the southern and eastern states of the Russian Federation, South Africa, to overcome their huge imports of wheat-based products have introduced subtropical varieties that have been very successful and have significantly reduced imports of these products, the cost of living and the poverty of the populations.

Since 2005, in Kenya, KARI scientists have studied more than 200 thousand wheat germplasm and so high-yielding wheat varieties, Eagle 10 and Robin have been created (NJoro, 2011). In 1982, half of the 70 million hectares of wheat in developing countries used high yielding varieties (ORVs). These semi-dwarf varieties for irrigated cultivation, which yield two to three times that of traditional varieties, have been widely successful (CTA, 1989). In Ethiopia, varieties have been developed by researchers through an approach focused on enhancing the sustainability of new wheat varieties against any wheat disease (Omer Redi, 1978).



The cultivation of wheat will enable African countries to ensure their food independence (Jean BOUTRAIS, 1982).

Congo, 40% of whose area is covered by savannah, has a non-existent wheat crop. Some work has been done in Congo, unfortunately no article has been published on this subject.

In tropical countries, low-altitude wheat cultivation constraints are reported during the hot season. This crop is recommended at altitude during the dry season with a large influx of water by irrigation as is done in irrigated wheat cultivation in Turkey, Afghanistan, Egypt and others. Some countries, such as Rwanda, Burundi or Uganda, have yield potential that could quickly reach 4T / ha, where the average world yield is around 3T / ha. This gives an idea of the potential of wheat cultivation in Africa (Afrique Economie, 2012). From now on, Burkina Faso can reduce its imports and manufacture its bread, whose consumption continues to grow, with local wheat thanks to the project of the valley of Sourou and in the zone of Di (AiméFlorentinBationo, 2016, Jean Baptiste Marot , 2006, AMVS, 2004) We know that the dry season is short-lived, and that the longest hot season of the year has a very marked effect on the quality of crops such as market gardening. This is why we plan to test the behavior of five varieties of wheat from India to appreciate their adaptability in the soil and climatic conditions of Brazzaville.

- How will the change in altitude affect the phenology of five varieties from India?
- Can mineral and organic fertilizer inputs contribute to the growth and productivity of these varieties under Brazzaville conditions?

## 2. EXPERIMENTAL DETAILS

In this crop trial, the factors studied are the five Indian varieties of wheat, Jarissa, SO-126, SO-160, SO-119, SO-78, which are qualitative factors and each variety is a variant. The fertilizer doses are those applied internationally. Other quantitative factors to be observed are height growth, number of thalli formed and amount of grain produced. These measurable factors each constitute a modality.

Treatments will be uniform for all varieties of wheat namely: same amount of organic manure, same amount of mineral fertilizer and even fractionation of fertilizer during growth.

In this work, five wheat varieties were selected and tested in India for adaptation in Congo. This choice is based on climatic constraints.

### 1. Experimental device

The experimental device setup includes:

- Experimental unit consisting of a plank of 2m<sup>2</sup> including 49 bunches of 5 seeds of wheat a total of 490 seeds in germination;
- The footpegs are 1m wide to move from one experimental unit to another;
- Border effects are reduced by considering only the modalities placed at the center of the experimental units;
- The plan of the experimental device: 1st device for the adaptability of five varieties.

*Table 1: Device for the adaptability of wheat five varieties.*

Bloc1	B1	B2	B3	B4	B5
Bloc2	B4	B5	B2	B1	B3
Bloc3	B2	B4	B1	B3	B5
Bloc4	B3	B1	B4	B5	B2

NB: B1= Jarissa; B2= SO-126; B3=SO-160; B4= SO-119; B5=SO-78.

## 2. Observations and measurements

They include:

- dates of sowing and emergence;
- measurements, once a week;
- tillages equal to the average number of tillers formed per plant;
- dates of entry into heading;
- flowering dates;

Maturation dates;

- number of sprouts germinated per pouch;
- yields in T / ha.

## 3. Ground preparation

Soil should be dug and weeded so that wheat does not compete with weeds as it grows. At the time of plowing, 10 tonnes of manure are buried per hectare. In acidic soils, it is also possible to make Calcomagnésian amendments to bring the pH closer to neutrality.

The recommended seeding rates are in the order of 100 to 150 kg / ha of treated seed and it is recommended to plant in rows spaced 15 to 25 cm apart at a depth of 3 to 5 cm. We recommend a ratio of 300 to 500 kg of NPK fertilizer (possibly supplemented with boron) at the time of sowing followed by a ratio of 50 to 100 kg of urea.

## 3. RESULTS

We determined the germination capacity of the seeds (shoot rate, mortality rate, emergence) and observed the average number of leaves of the shoots (collected every 15 days), the heading (period of heading, the number of 'ears per plant') and then measured the growth parameters of the five (05) varieties sown. Figure 1 shows the evolution of plant size of each variety.

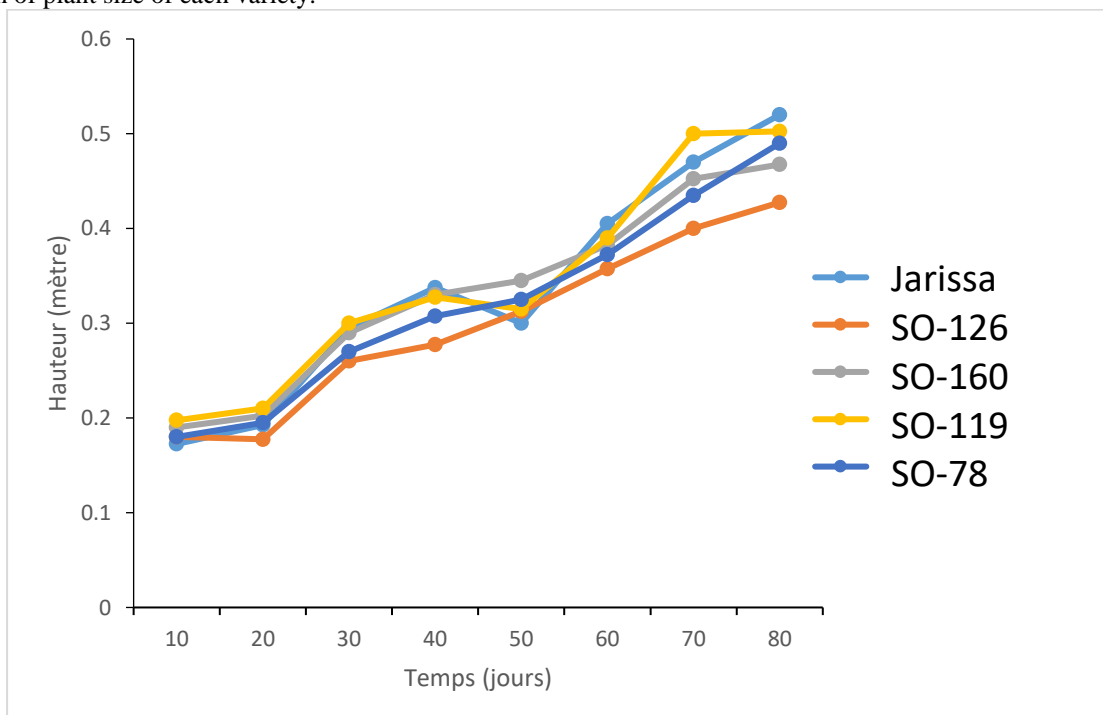
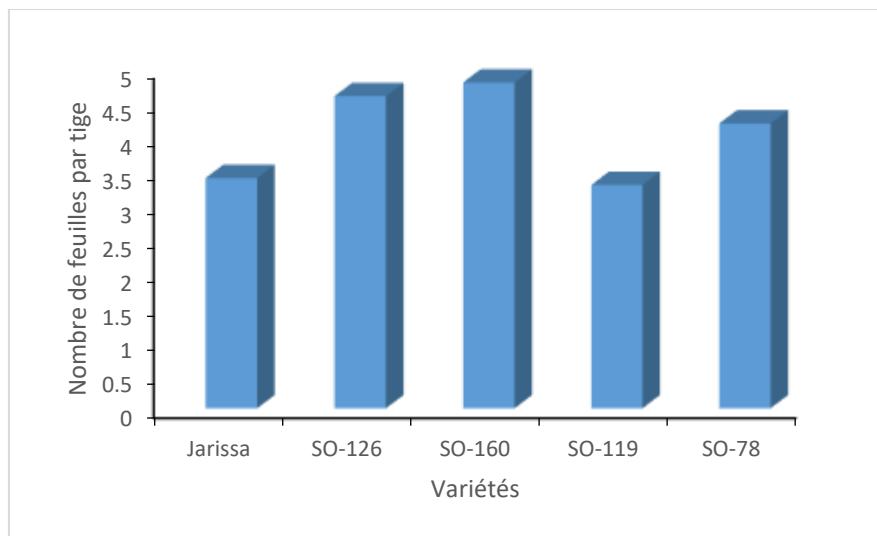


Figure 1: Evolution of plant size during the vegetative cycle of different wheat varieties

The comparative study of the development of the size of the five (05) varieties of wheat shows us, for the first vegetative cycle of the plants, a growth in height that is almost similar for all the varieties. We notice a difference about seventy (70) days after the second month, during which the Jarissa varieties followed by SO-119 dominate the rest of the varieties. After 70 days only Jarissa variety remains the only dominant in height and reaches a size of half a meter.

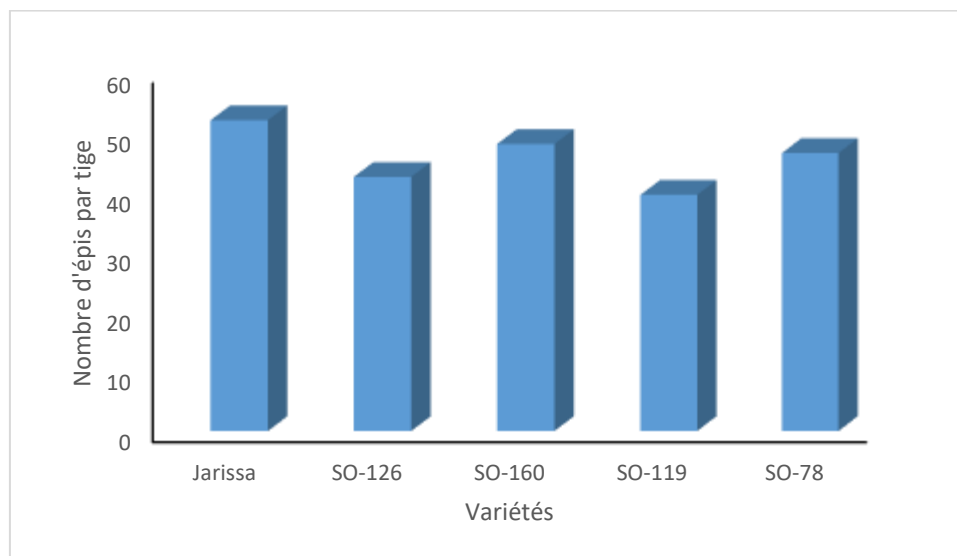
Jarissa is the variety with the highest size followed by SO-119. The lowest were the varieties SO-126 and SO-160.

Regarding the height, the good development was obtained by the varieties Jarissa and SO-119.



*Figure 2: Variation of the quantity of leaves per stem as function of wheat varieties*

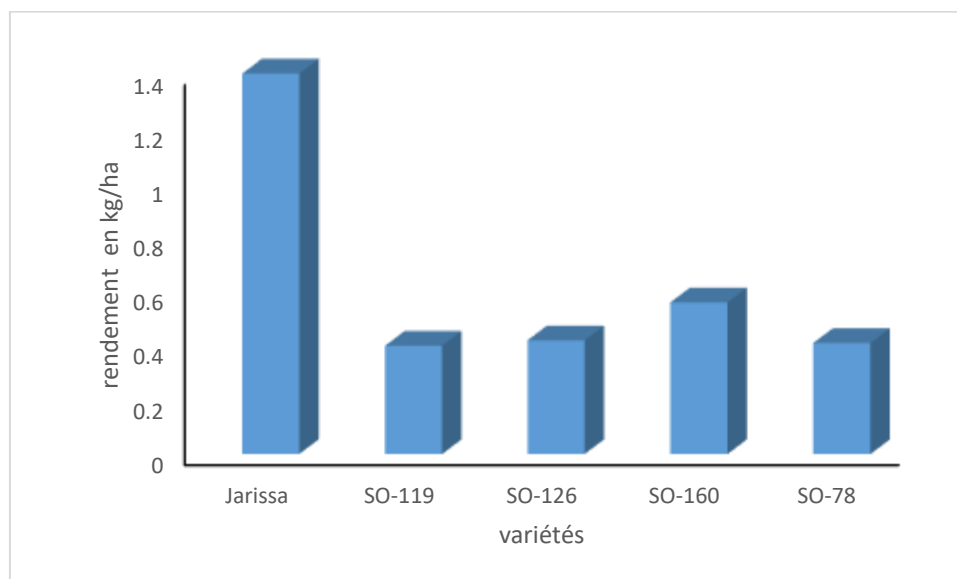
Figure 2 gives the results on the variation of the average number of leaves of each variety. Comparative study shows more leaves per stem for SO-160 and SO-126 followed by SO-78



*Figure 3: Variation of the number of ears per stem as function of wheat varieties*

Figure 3 presents the results of the variation of the number of ears according to each variety. The number of ears per board is higher for Jarissa followed by the variety SO-160 and SO-78.

The Jarissa variety performs better compared to other varieties. The high number of ears normally provides a good productivity of the variety, so a better yield relative to the other varieties.



*Figure 4: Yield as function of wheat varieties*

The results obtained from these trials show that the Jarissa variety behaves better under the conditions of Congo Brazzaville.

The comparative study of five (05) varieties of wheat has shown that two varieties can be adapted to wheat cultivation in Congo:

The Jarissa variety was found to have the best plant size, the highest number of ears per board and the best yield. The SO-160 variety has the best number of ears per board and the highest number of leaves per stem. These two varieties of wheat were selected as the best suited during cultivation in Congo Brazzaville

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