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Short Communication

Test of Indian wheat crop suitability in the Congo

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Abstract

The basic foods most commonly consumed in Congo are flour derivatives. These products are fully imported, which contributes to the cost of living. In order to reduce imports of these products, we considered adopting a local wheat crop from the five Indian varieties. In this work five varieties of wheat were tested in order to assess their adaptability in the soil climatic conditions of Brazzaville. The study of the impact of different fertilizer doses on the cultivation of wheat of the variety SO-119 with the comparison parameter size, number of leaves per stem, ears per board and yield, showed that the best results were obtained with the fertilizer dose of 90 g. This dose is followed by 60g and 120g of fertilizer. This shows that the wheat crop adaptation tests in the Congo must be done with these three doses.

Keywords: Flour derivatives, wheat crop, fertilizer, crop, food, soil, Indian Wheat.

Introduction

Wheat consumption in all African countries has been steadily increasing over the past 20 years due to changing food preferences, a strong trend towards urbanization and population growth[1].

Bread consumption is a relatively recent phenomenon in Black Africa. This increase is not regular but is subject to a series of sudden changes[2].

The development of wheat production could "if Africa does not move towards wheat self-sufficiency, it could face new famines, instability and even political violence, as the bread riots showed in North Africa a few years ago.

To combat the famine and soaring grain prices that are ravaging Africa, a public report by the International Maize and Wheat Improvement Centre, an NGO based in Mexico City, at a wheat conference in Ethiopia, proposes to develop wheat cultivation in the continent[3].

Africa could easily develop wheat crops to feed itself and escape price fluctuations and instability[4,8-14]. As consumption increased, several countries in sub-Saharan Africa, including Cameroon, decided to start a large wheat crop[2]. In some countries, such as Rwanda, Burundi and Uganda, yields can quickly reach 4 tonnes per hectare. This gives an idea of the potential for wheat in Africa[2, 15, 16].

Average wheat productivity in Sub-Saharan Africa (SSA) is 1,7 tonnes per hectare, 50% below the global average[5,17,18]. Differences between potential and average yields on farms are often more than five times higher. Inadequacies of improved technologies, varieties, seeds, improved agronomic practices and pesticides[1].

The trend increase in yield increases the need for nitrogen. In order to be fully effective, nitrogen manure adjustment must be accompanied by fractionation of nitrogen doses throughout wheat growth[6,15,17].

The intensification and increased productivity of cereal crops requires, among other things, rational and rational use of chemical fertilizers[7].

In this study we focused on the influence of different doses of mineral nitrogen fertilizers on the plant and the search for the optimal dose of nitrogen in order to achieve a better yield potential of wheat in Republic of Congo.

Methodology

In this crop test, the factor studied is the impact of NPK nitrogen fertilizer doses on the Indian wheat variety SO-119, which are qualitative factors and each fertilizer dose a variant. The different doses of NPK applied are 0g as control, 30g, 60g, 90g, 120g, 150g.

Other quantitative factors to be observed are height growth, number of fronds formed, number of stems and quantity of grains produced. These factors each constitute a modality.

The experimental site of the study turns out to have been the former site of ORSTOM, currently called the scientific city of Brazzaville.

Experimental device: The experimental unit (Figure-1) is made up of a 2m² board comprising 49 paquets of 5 wheat seeds or a total of 490 sprouting seeds; The steps are 1m to go from one experimental unit to another; The effects of the edges are reduced by considering only the methods placed in the center of the experimental units; Design of the experimental device on the study of the evolution of the crop and the productivity of the wheat according to the different doses of fertilizer on the Indian variety SO-119 (6 treatment and 3 repeat).

Dimension of the experimental field each unit tested is a block with a surface of $2m^2$ or 2m in length of 1m in width. The field has 20 blocks spaced 1 m apart. This gives a plot with a length of 16m and a width of 9m, its surface is then $144m^2$

Observations and Actions: i. Sowing and emergence: number of seeds sprouted per pan; ii. Measurement: once a week; iii. Tallage: number of studs formed per variety; iv. Date of entry into the position; v. Date of flowering; vi. Date of maturity; vii. Grain yield; viii. Temperature and precipitation records; ix. Diseases, pests and weeding of data.

Preparation of soil: The soil must be dug and weeded so that wheat cannot compete with weeds as it grows. At the time of ploughing, 10 tonnes of manure are buried per hectare. In acidic soils, it is also possible to make calcomagnesial amendments to bring pH closer to neutrality. The recommended seeding rates are in the range of 100 to 150kg/ha of treated seed and it is recommended to plant in rows spaced 15 to 25cm at a depth of 3 to 5cm. We recommend a 50 to 100kg intake of urea at the time of showing.

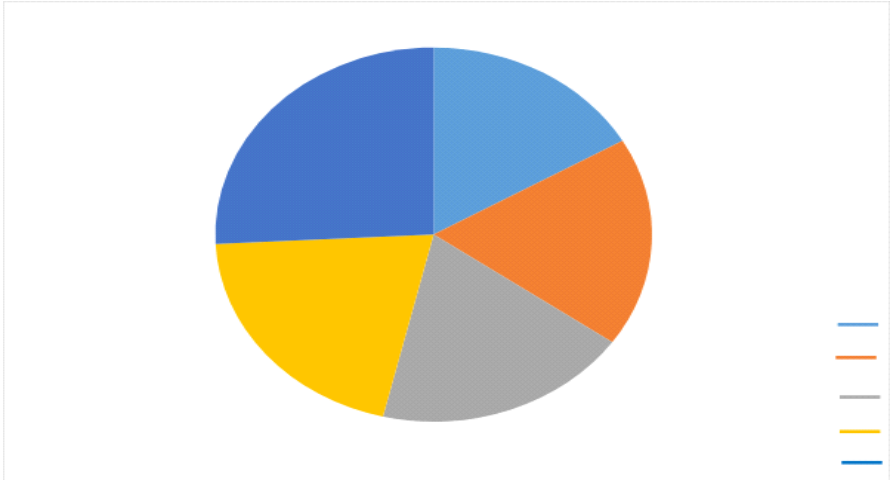
Experimental follow-up: Comments on: i. seed germination capacity (percentage growth rate, mortality rate, emergence), ii. number of stem leaves (every 15 days), iii. foliage (intense or not), iv. flowering (flowering period, number of flowers per plant), v. head, number of ears per plant, vi. plant growth parameter.

Results and discussion

A comparative study of the evolution of the size during the growing cycle of the wheat variety SO-119 according to the different doses of mineral fertilizer, showed us that we had the largest plants with the 120g dose of NPK the highest fertilizer dose at 150g NPK gave only the fourth height. The dose of 120 ga was followed by that of 90g, 0g and 60g. It can be said that the best doses of fertilizer for the correct evolution of the plant size are 120g and 90g of NPK.

Bloc1	30	120	90	150	60	0
Bloc2	150	90	60	0	30	120
Bloc3	0	30	150	60	120	90

Figure-1: Experimental device



Where: - Dose 0, - Dose 30, - Dose 60, - Dose 90, - Dose 120, - Dose 150.

Figure-2: Change evolution in plant size during the vegetative cycle as a function of mineral fertilizer dose for SO-119.

The comparative study of the evolution of the size during the vegetative cycle of the wheat variety SO-119 according to different doses of mineral fertilizer, shows us that we had the largest with the dose of 120g of NPK, the highest fertilizer dose of 150g of NPK gave only the fourth plant height. The 120g dose was followed by the 90g, 0g and 60g dose.

It can be said that the best dose of fertilizer for the good evolution of the plant in size is 120g and 90g of NPK.

The highest number of ears was obtained with the highest dose of fertilizer of 150g NPK, followed by 60 and 120g. This suggests that these three doses will give us a better yield. These will therefore be the most appropriate doses for wheat cultivation in the Brazzaville Congo.

This Figure-4 shows that the best yield of the plants was less than 90g of fertilizer, followed by doses of 60g, 0g and 120g. It is remembered here that the appropriate dose is finally that of 90g of mineral fertilizer.

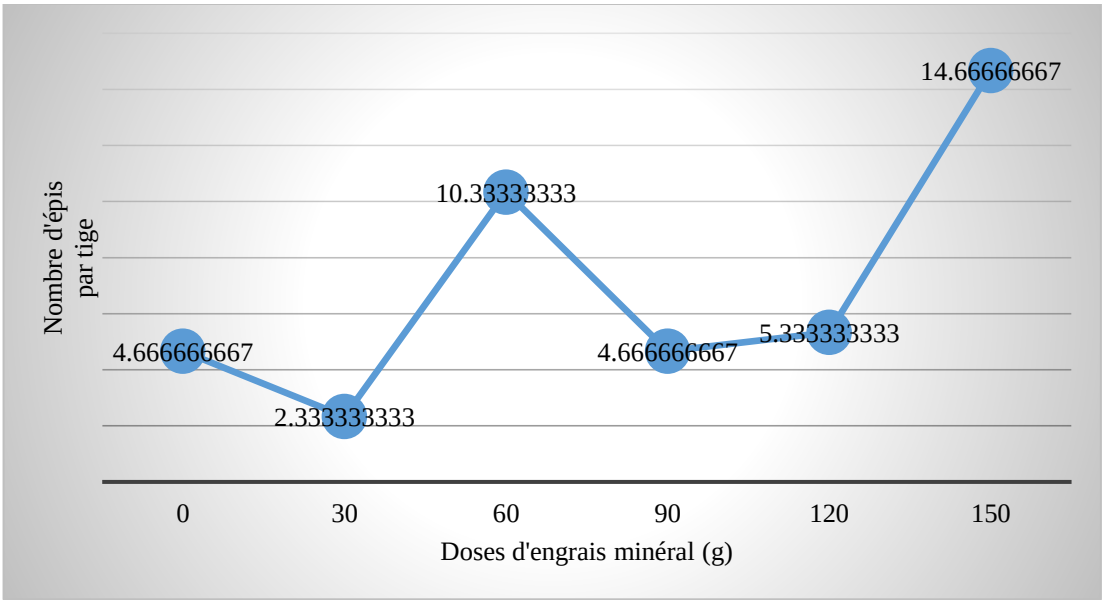


Figure-3: Change in number of ears per stalk as a function of mineral fertilizer doses in the Case of variety SO-119.

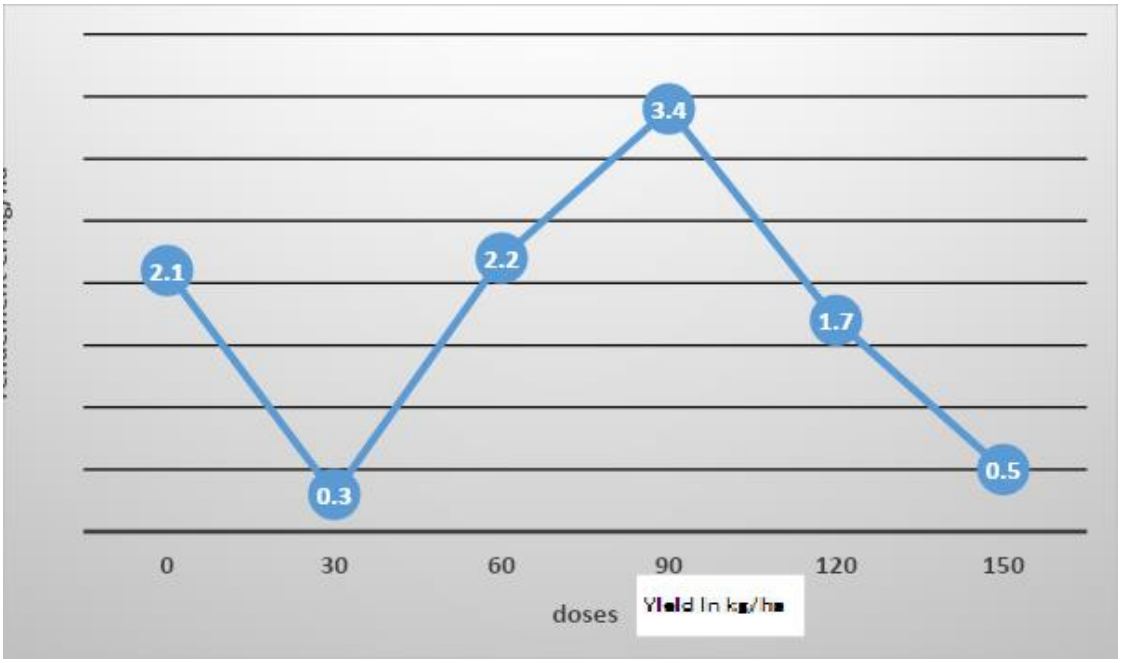


Figure-4: Yield in kg/ha as a function of mineral fertilizer doses on SO-119.

Conclusion

The study of the impact of different doses of fertilizer on the cultivation of wheat of the variety SO-119 in the Congo Brazzaville under the conditions of the scientific city of Brazzaville, with the comparison parameter size, the number of leaves per stem, the spike per board and yield, shows us that the best results were obtained with the fertilizer dose of 90g, namely: better yield, second best size, third number of ears per stem. This dose is followed by 60g and 120g of fertilizer. It is therefore proposed to continue the trials for the introduction of wheat cultivation in the Congo with these three doses.

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