Avoy-Insurance Responses in Nursery and After Transplanting of the Other Planting of *Acacia Nilotica* (L.) Wild. exDelile Subject to Different Types of Fertilization in the Sahelian Area of Cameroon

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Abstract: ***This work aims to evaluate the effect of nursery fertilizers on the morphological and physiological quality of Acacia Nilotica's planting and their behavior after transplantation in the natural environment. The test was conducted in a greenhouse with a completely randomized blocking device with the processing of the repeated fertilizer types 8 times. In total, 7 fertilizers were used with 3 simple (mineral (FM), organic (FO), biological (Mycorrhizes): FB) and 4 combined (FO * FB; FO * FM, FM * FB and FO * FM * FB). The plants that have not received no fertilizer are considered witnesses. After 4 months in nursery and before transplantation, the growth and physiological parameters that provide information on the water status of the plant were measured. Survival rates at 30, 180 and 360 days after transplantation (JAT) were calculated. It therefore occurs that any type of fertilizer applied, the growth parameters as well as the physiological state (water status) of the plant are improved. The height of the plants increased from 20.61 cm (witness) to 25.34 cm with fo, at 25.79 cm with BF * OF and 28.19 cm with BF * OF * MF. This good growth is accompanied by a water (potential potential (ψf> - 1.3), of perspiration (EF> 3GH - 1) and a stomach conductive (≥ 4 (Molh2OM - 2S - 1) higher in the plants having received fertilizers. The rural rate is about 100% with FO * FB * FM, 50% with MF and 75% with other fertilizers against 25% in witnesses. Thus, the control of forest plant fertilizer may be an asset to improve the production of young nursery plants for successful reforestation campaigns.***

Keywords: Fertilization, *Acacia Nilotica*, growth parameters, physiological parameters, transplantation, Sahelian area

1. Introduction

The strong demographic pressures observed in recent decades generate enormous environmental problems [1], as the disappearance of natural formations, especially species for multiple use as *Acacia Nilotica* [2]. The latter is very sought in the field of the pharmacopoeia [3], rascitory raising [4], and in the leather industry [5]. Indeed, the Sahelian Zone of Cameroon loses nearly 34% of its wooded area per year for the benefit of agriculture [6]. Hence the urgency to accelerate reforestation programs. What was undertaken by the Cameroonian State and non - governmental organizations, but many people were sold by chess [7] [8]. One of the major causes of this failure is the high mortality rate of young planting after transplantation [9]. Indeed, the young plants have trouble to acclimatize because, in this area of Cameroon, soils are very lesified (poor in mineral elements) [10], rainfall is down and temperatures are becoming higher [11]. It should therefore be put in place of the techniques of obtaining the vigorous plants, that is to say physiologically well supporting plants able to cope with transplant stress. Several authors have led to this problem by addressing different aspects such as selection of seed resistant species [12], the study of water operation of the plants for good irrigation, the management of nurserless plants for good adaptation [13]. But fertilization in nursery forest species remains very unhealthy. Yet young clubs of wood, just like other plants absorb minerals over their growth, to meet their physiological needs and grow. In addition, forests know that the nursery goal is not to produce « beautiful plant », but « good plant » that are capable of excellent recovery and early initial growth after transplantation [14]. This goal can only be achieved by good nutrition of planting. The enormous progress in agriculture is known through the rational employment of fertilizers, it would be therefore advisable to experiment to nursery fertilization for forest plants such as *Acacia Nilotica* to produce « good plant » for successful reforestation programs. Thus, the objective of this study is to evaluate the effects of the different types of fertilizers on the growth and physiology of the N. / *Nyloticanutilipous* plants and after multilingual transplantation.

2. Materials and Methods

Study site

The study was carried out in Maroua, in the far - northern region between 10 ° 00 ‘and 13 ° 00’ of north latitude and 13 ° 30’et 15 ° 30 ‘longitude is. The conduct of the nursery was made under cland at the IRAD - MAROUA station (Institute for the Agricultural Research and Development of Maroua) and the transplantation of the plants was performed in the district Dougoy (10 ° 37 'and 10 ° 39' of latitude North and 14 ° 28 'and 14 ° 29' longitude is). Locality is governed by a hot climate [15]. Indeed, the annual thermal average is about 28 ° C, with a maximum of 41 ° C reached in April and a minimum of 11 ° C observed in January. There are about 815 mm rains per year [16]. Natural vegetation that tends to disappear under the rapid population pressure is a thorny steppe with a patio - friendly of avavenna. The most represented species are: *Acacia Hockii*, *AlbiziaChoneneri*, *AvagyptiacaBalanites*, *BahiniaRufescens*, *CombretumAcuulatum*, *DichrostachysCinerea*, *ZiziphusMauritriana*, *PiliostigmaReticulatum*, *StrychnosSpinosa*, *Ximenia American*, etc.

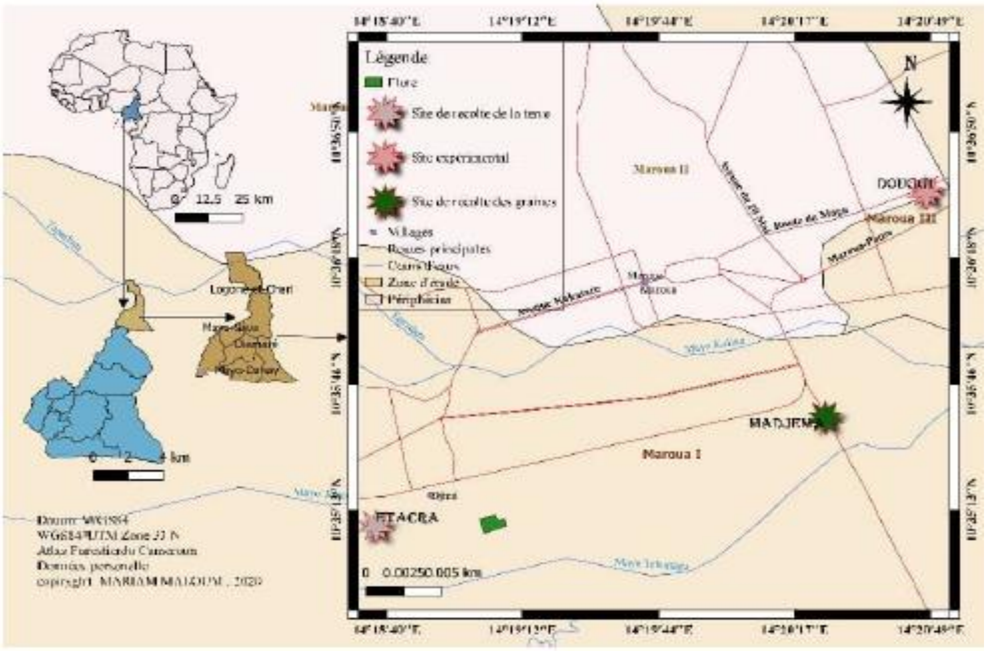

Figure 1: Location of study site

Material

The plant material was constituted by *A. Nilotica* seeds collected on ten (10) feet in Madjema (10 ° 35'37''n, 14 ° 20'24''E) in the district of Maroua I. As for the fertilizer material, it consisted of three (03) types of fertilizers:

- Mineral fertilizer (FM) consisting of NPK (20 - 10 - 10) purchased from phytosanitary agents of the city;
- Organic fertilizer (FB) consisting of non - inoculum Mycorhizi (composite of *Gorus* and *Gigaspora genus* mushrooms spokes, provided by the Nkolbisson Biotechnology Center at the University of Yaoundé I.
- Organic Fertilizing (FO) consisting of cow college collected from the breeders.

Experimental device

The experimental device was a completely randomized block. The different types of fertilizers represent the treatment and the experimental unit is a number of pots (4 fertilizers 4 x blocks X 2 plasters), 4)., 3) (OB), organic (F1), organic (FO), organic (FO), organic (FO), organic (FY), BF (4), the constant (6), the condone (4), the condone (4), the conveyor (8), the conveyor of the number of pots (8), the organ of the number of pots (8), the organ of the number of pots (8), the organ of the number of pots (8), the organ of the number of pots (2), the organ of the number of pots (2), the organ of the number of pots (8), the organ of the number of pots (8)., 4)., The organisms (3), the condonement of the number of pots, the number of pots, (1), the organ of the number of pots (8)., 4)., The organisms (3)), (3), the condonement of the number of pots, (1), the organ of the number of pots (8)., 4)., The use of the number of pots, the number of pots, (1), the organ of the number of pots (8)., 3)., 3) (other), the organ of the number of pots (8)., 4)., The organisms (3), the condonement of the number of pots (8)., 3) (NO), the organic (F1), organic (F1), organic (F (a), organic (FO), organic (FO), organic (FO), organic (FO), organic (FO), organic (FO), organic (FO), organic (FO), organic (FO), organic (FO), organic (OF), FI, Fi, FC, F1 and FO * FF * FB and the witnesses which have not received a petruming crop and soil treatment The use of use was taken from dummyo manuals This floor was rid of harmful waste and mixed at 30% sand to boost permeability and improve its structure. The pots were filled with this composite at 2/3. The filling soil had therefore a clay - sandy structure, similar to the soil on which prosperous *A. Nilotica* naturally. The ground of the pots to receive the Mycorrhizations was autoclaved at 120 ° C for 4h to rid them with any microorganism [17]. This particular treatment of the pots of the pots to receive biological fertilization was aimed at preventing any interaction between the microorganisms present in the ground with the macecarizes provided.

Table 1: Physico - chemical Characterization of the ground used in nursery

Characterization	OM (%)	N (%)	Pass (ppm)	CEC (méq/100g)	pHeau	Clay (%)	Limon (%)
Chemical composition	0, 64	0, 39	15, 37	3, 59	6, 74		
Physical composition						5, 56	27

OM: Organic matter, N: Nitrogen; Pass: Assemblon Phosphorus

Pretreatment of seeds and seedlines because of their late guarding, it was necessary to pretate seeds before seed. To do this, the seeds were soaked in a boiled water at 100 ° C for 10 minutes, then they were removed and kept for two days in a wet environment. The seeds thus pretreated were sown in 3cm holes in nursery pots. A total of 256 seeds were sown, 2 seeds per pot. Thus, 192 planting received at least one type of fertilizer, the 64ers have received nothing and served as a witness.

- Please of fertilizers and maintenance of pots: The application of fertilizers varied by type of fertilizers: for the Mycorrhizes (FB), the method used was the coating and 2 g of inoculum were applied on seeds and by pot. With regard to the cow's treatment (FO), 10g of muds were applied by punch on seedling. For NPK treatment, 2 g of NPK were applied by punch [18]. Win combinations of two fertilizers, doses were reduced by half for treatments [19]: - 1g of Mycorrhizes + 5g of Bond for FB * OF treatment; - 1g of Mycorrhizes + 1G of NPK for FB * FM treatment; - 1g of NPK + 5g of muds for FM Wind Foid. In the case of treatments constituted by triple combination of fertilizers, the doses were reduced to a third: ie 3.3g of muds + 0.6g of NPK + 0.6g of Mycorrhizes for FB * FO * FM treatment. Maintenance operations have been used for watering and weeding. The pots were watered twice a day (morning and evening) with the ability to the field.
- Transitlature in the field transplantation was made on a soil whose cultural history was millet. Two pots of each block treatment were transplanted in fields (a total of 64 plants: 8 treatments x 4 blocks X 2 pots). For transplantation, 15 cm deep holes and 5cm diameters have been dug; and watered the day before the transplantation. When the killy, the most surface (0 - 10 cm) was preserved to be submitted after minking before the grounding of the plants, this because this soil is rich in organic matter and must be preferably in contact with the roots of the plant [19]. The plants were transplanted in the evening (17 hours) to allow them to come to the new environment before sunrise.
- Measurement of dendrometric parameters of nursery plants: The dendrometric parameters (the leaf surface, number of leaves, height of the plants, the diameter of the collar) have been manually measured on all the plants. On the other hand, the biomasses (aerial and root) were measured on 64 plants (8 treatments x 4 blocks X 2 pots). The steps were carried out four months after seeding because it is the time indicated for the stay of nurseries. Evaluation of physiological parameters beyond the dendrometric parameters, the physiological parameters of the plant were also measured at the end of the stay of young nursery shoots. We have focused on 5 physiological variables that provide information on the water status of the 4 months after seedlings. This is the photosynthetic potential marked by measuring the net assimilation of CO_2 (Anet), the foliar perspiration (EF), the stomach conductive (GS) (these three parameters are measured using a modern C22 C22 - based model CO_2 model.). And the foliar water potential (ψf) of the plant was measured using a Scholander type chamber, SF - PRES - 100 - based and 5 block leave model. The intrinsic oil use (EUEI) was calculated by Flexaset al. (2010), EUEI: A / GS where A represents the photostythesis and GS represents the stomactive conductance.
- Measures of field variables After four (04) Monthly nursery, the plants were set in field. One year after transplantation, the measurement of the growth parameters (height and diameter of the collar) was carried out and the data have calculated the performance indices (increase rate). The survival rate was also calculated this after 30, 180 and 360 days after transplantation (DAT).
- Statistical analysis for each of the parameters followed, the ANOVA has been used to compare the 8 types of fertilization. When a difference is significant, the ANOVA is complemented by the multiple extent test. These tests were made using the StatGraphics Centurion version XVII software.

3. Results

3.1 Effect of fertilization on the growth of the nurseries in the epicing

In general, the measured dendrometric parameters vary significantly ($p <0.0001$) depending on the type of fertilizer (Table 2). Indeed, the lowest values were observed in the control plants, or 20.61 ± 3, 67cm, 1.41 ± 0.41cm, 0.66 ± 0.08 cm and 16.91 ± 4.31 sheets / respectively respectively for the height of the plant, the diameter of the collar, the number of leaves by plant and the leaf surface. The highest values have been observed in the plants having the combination of the three fertilizers (FO * FM * FB) because, the values found multiplied those of the witnesses by 1.4; 1.7; 1.3 and 1.5 respectively for the height of the plant, the diameter of the collar, the number of leaves by plant and the leaf surface. This could be due to a synergistic effect of the different fertilizers. Indeed, the Mycorrhizes not only facilitated the absorption of the nutrients made by the mineral fertilizer (NPK) but also, those contained in the organic matter brought by the cowhouse and even those initially present in the culture ground. Between the biofurators, there is no significant difference ($p> 0.05$) between the different combinations for all the variables considered. Considering only monofratizers, it appears that the feucoant FOA allows to obtain the highest values of about 21 leaves / plant; 25.34 cm for height, 2.08 cm for the diameter of the collar and 0.73 cm for the leaf area. In addition, it appears that the values obtained FO are not significantly different from those obtained with the bi and trichinated fertilizers. It is even, the data obtained on biomass show that air and bass biomasses were higher in the combination of the three types of fertilizer FM * FO * FB respectively 5.53 ± 0.64 g and 3.93 ± 0.02 g, followed by the combination FB * FO (4.85 ± 0.01g for air biomass and 3.21 ± 0.03 g for rooty biomass).

Table 2: Variation of growth parameters according to the type of fertilizer

Fertilizer	Plant height (cm)	DC (cm)	LA (cm)	NL/plant	AB (g)	RB (g)
T	20, 61±3, 67a	1, 41±0, 41a	0, 66±0, 08a	16, 91±4, 31a	2, 34±0, 15a	1, 15±0, 01a
FB	21, 64±3, 99ab	1, 97±0, 33b	0, 73±0, 11b	19, 64±2, 81b	2, 93±0, 02b	2, 51±0, 01c
FM	22, 35±4, 41ab	2, 06±0, 50b	0, 73±0, 08b	18, 68±3, 40b	3, 56±0, 31c	2, 21±0, 02b
FO	25, 34±3, 97cd	2, 08±0, 46b	0, 71±0, 16b	20, 57±3, 62bc	3, 83±0, 15c	2, 19±0, 02b
FB*FM	23, 43±4, 44bc	2, 09±0, 43b	0, 76±0, 09c	23, 42±5, 18c	3, 64±0, 15c	2, 34±0, 01b
FO*FM	23, 86±5, 05bc	2, 11±0, 41b	0, 79±0, 12c	21, 5±3, 30bc	3, 60±0, 12c	2, 25±0, 01b
FB*FO	25, 79±3, 99c	2, 17±0, 27b	0, 79±0, 09c	21, 61±2, 60bc	4, 85±0, 01d	3, 21±0, 03c
FO*FM*FB	28, 19±3, 96d	2, 35±0, 40c	0, 84±0, 09d	25, 26±4, 39d	5, 53±0, 64e	3, 93±0, 02cd
F	5, 94***	6, 41**	2, 27***	5, 96***	40, 86***	54, 86***

DC: diameter in the collar; **LA**: leaf area; **NL**: nombre of leaf; **AB**: air biomasse; **RB**: rootybiomasse; **a, b, c…** by column indicate that the averages are significally different; **F**: Fisher coefficient; ***: p<0, 0001; **FB**= Biological Fertilizer, **FM**= Mineral Fertilizer, **FO**= Organic Fertilizer, **FB*FO**= Biological Fertilizer + Organic Fertilizer, **FB*FM**= Biological Fertilizer + Mineral Fertilizer, **FM*FO**= Mineral Fertilizer + Organic Fertilizer, **FM*FB*FO**= Mineral Fertilizer + Biological Fertilizer + Biological Fertilizer, **T**=Control

3.2Physiological parameters

In general, fertilizers positively and significantly affect the different physiological parameters measured (p <0.001). In fact, weak values were observed in the control plants (Table3). By comparing the effect of fertilizers between them, it appears that the composite of the 3 fertilizers (FO* FB * FM) gave higher values and mono - formulations, the lower values except the biological fertilizer (BF) whose values were sometimes higher than those of the bis fertilizers. Thus, for the net assimilation of CO_2 (Anet), the value obtained. FO * FB * FM is about 4.5 times that obtained in witnesses (12.25 µmol CO_2 M - 2 S - 1). FB * FM has resulted in multiplying this value found in witnesses by about 3.6 (44.25 µmol CO_2 M - 2 S - 1). OF * FB (28.05 µMol CO_2 M - 2 S - 1), FO * FM (23.52 µmol CO_2 M - 2 S - 1) and FB (23.92 µmol CO_2 M - 2 S - 1) have permitted to multiply the value found in the witnesses by about 2. Finally, FO (13.30 µmol CO_2 M - 2 S - 1) and FM (14.76 µmol CO_2 M - 2 S - 1) have multiplied by 1.2. It is therefore departed that the triple formulation stimulates a good assimilation of CO_2 by the plantsunt. This could be explained by the fact that the mineral material of the ground was boosted by the supply of mineral fertilizer. In addition, all FB fertilizers were very effectively because of the mycorrhizes that would have facilitated the assimilation of soil nutrients.

Table 3: Variation of physiological parameters according to the type of fertilizer

Fertilizers	A_{net} (µmol CO_2 $m^{-2}S^{-1}$)	Ψ_f (MPa)	E_f (gh^{-1})	Gs (mol$H_2O$$m^{-2}S^{-1}$)
T	12, 25±0, 9a	- 1, 6±0, 06a	2, 77±0, 08a	0, 35±0, 06a
FM	14, 76±1, 13c	- 1, 29±0, 02b	2, 98±0, 06b	0, 41±0, 07bc
FB	23, 92±1, 03d	- 1, 18±0, 04d	4, 91±0, 13e	0, 46±0, 02c
FO	13, 30±1, 10b	- 1, 26±0, 01b	3, 76±0, 28c	0, 38±0, 02b
FO*FM	23, 52±1, 34d	- 1, 22±0, 01c	3, 81±0, 12d	0, 48±0, 01c
FO*FB	28, 05±1, 04e	- 1, 20±0, 02c	4, 98±0, 15f	0, 57±0, 05d
FB*FM	44, 25±1, 12f	- 1, 17±0, 05d	4, 96±0, 11f	0, 59±0, 03d
FB*FM*FO	55, 44±1, 18	- 0, 88±0, 015e	6, 14±0, 15g	0, 63±0, 03e
F	2214, 63***	427, 95***	13597, 84***	165, 49***

A_{net}: Carbone net assimilation; Ψ_f: Foliar water potential; E_f: Leaf sweating; Gs: Stomactiveconductance; **a, b, c…**by column indicate that the averages are significally different; **F**: Fisher coefficient; ***: p<0, 0001; **FB**= Biological Fertilizer, **FM**= Mineral Fertilizer, **FO**= Organic Fertilizer, **FB*FO**= Biological Fertilizer + Organic Fertilizer, **FB*FM**= Biological Fertilizer + Mineral Fertilizer, **FM*FO**= Mineral Fertilizer + Organic Fertilizer, **FM*FB*FO**= Mineral Fertilizer + Biological Fertilizer + Biological Fertilizer, **T**=Control

Just like the other physiological parameters, the intrinsic water efficiency of water was significantly improved by the different fertilizers except with FM and FO (Figure 1). Indeed, FO * FB * FM has multiplied this magnitude by 2.5 compared to the one found in the witness (35.23 (µmolmol - 1). BF * FM multiplied by 2 and FO * FB, FO * FM and FB by 1.5.

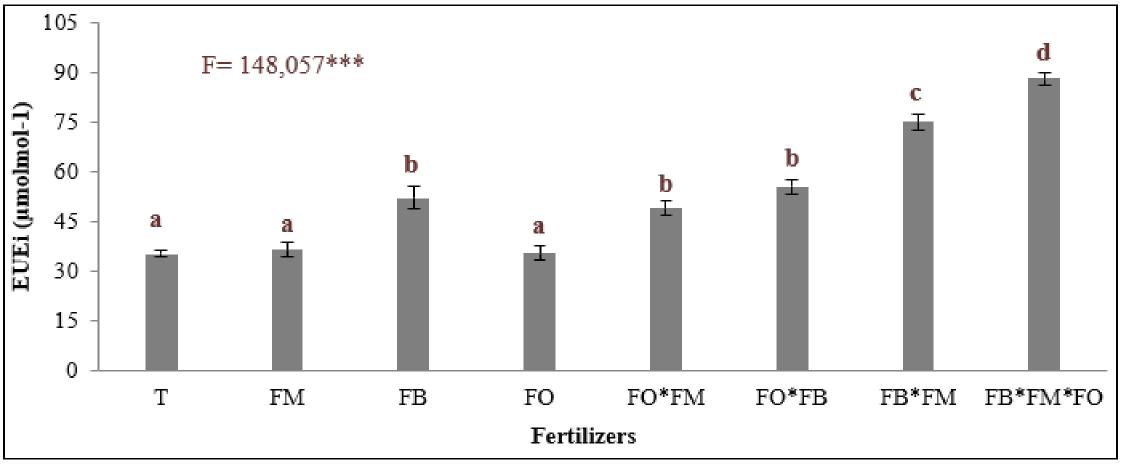

Figure 1: Variation of the efficiency of intrinsic water use (EUEi) according to the fertilization mode
The barcodes barrier indicate the standard devi**; a, b, c…**indicate that the averages are statistically different; **F**: Fisher coefficient; ***: p<0, 0001; **FB**= Biological Fertilizer, **FM**= Mineral Fertilizer, **FO**= Organic Fertilizer, **FB*FO**= Biological Fertilizer + Organic Fertilizer, **FB*FM**= Biological Fertilizer + Mineral Fertilizer, **FM*FO**= Mineral Fertilizer + Organic Fertilizer, **FM*FB*FO**= Mineral Fertilizer + Biological Fertilizer + Biological Fertilizer, **T**=Control

3.3 Measurement of field variables

After transplantation The taking of the dendrometric parameters (height and diameter of the collar) after a year in the natural environment has calculated the rate of increase of these parameters compared to the witness. The variation of this rate according to the type of fertilizer is recorded in Figure 2. It therefore depends only after a year in natural environment, the plants have a height and diameter of the lolker's higher than for the witnesses. For the height, this rate varies from about 22% (with FM) to 41% (with FB * FM and FB * F * FM). Between mono - fertilizer, it is FM that has been less effective (31%) and there is no significant difference between FB and FO. As for the bis - fertilizer, it is FB * FM that allowed the plants, to have higher heights with an increase of about 39%. For radial growth (diameter of the collar), the rate of increase is lower than that of the height. This would be due to the fact that secondary growth in the woody is very slow.

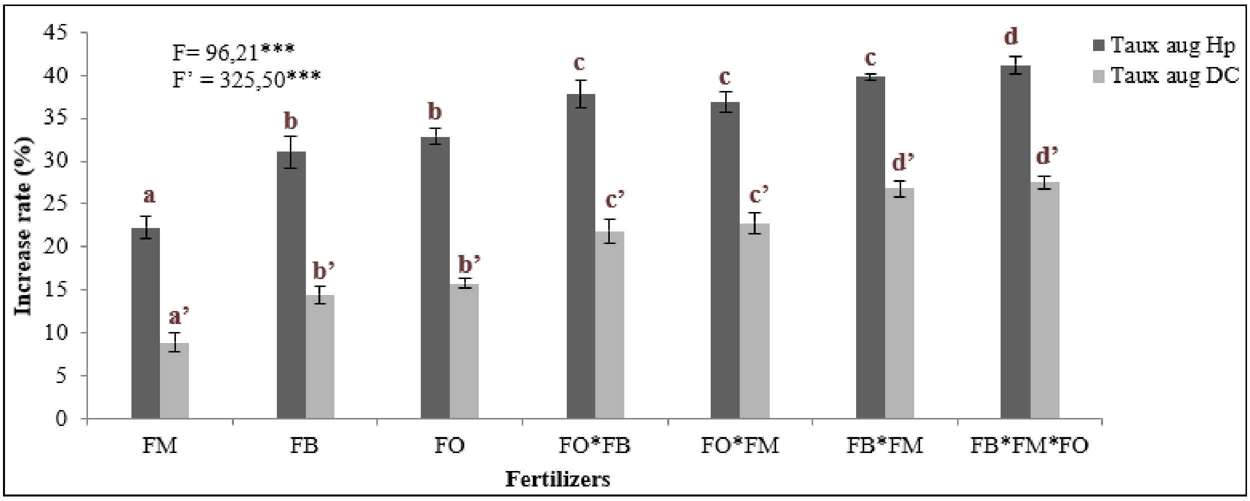

Figure 2: Variation of survival rate of the plants after one year of transplantation according the type of fertilizer
TauxaugHp: Increase rate of plant height; **Tauxaug DC**: Increase rate of diameterin the collar; The barcodes barrier indicate the standard devi**; a, a, b, b, c, c'…**indicate that the averages are statistically different; **F et F'**: Fisher coefficient; *****: p<0, 0001; **FB**= Biological Fertilizer, **FM**= Mineral Fertilizer, **FO**= Organic Fertilizer, **FB*FO**= Biological Fertilizer + Organic Fertilizer, **FB*FM**= Biological Fertilizer + Mineral Fertilizer, **FM*FO**= Mineral Fertilizer + Organic Fertilizer, **FM*FB*FO**= Mineral Fertilizer + Biological Fertilizer + Biological Fertilizer, **T**=Control

3.4 Survival rate

After a year in natural environment, the survival rate has been positively and significantly influenced by the different types of fertilizers (Figure 3). Indeed, 30 days after transplantation (JAT), only 50% of the controlling plants remained alive and 360 Jat, there remained only 25%. The best survival rates were obtained with BF * FO * FM and FO * FB (100%) followed by FeROISS FOOD and FO * FM with 88% to 360 JAT. Febilizers FB and FB * FM have achieved a 75% survival rate. Of all fertilizers, this rate was the lowest rate throughout the follow - up with FM because, 30 Jat, it was already 88% and 360 JAT, it was at 50%.

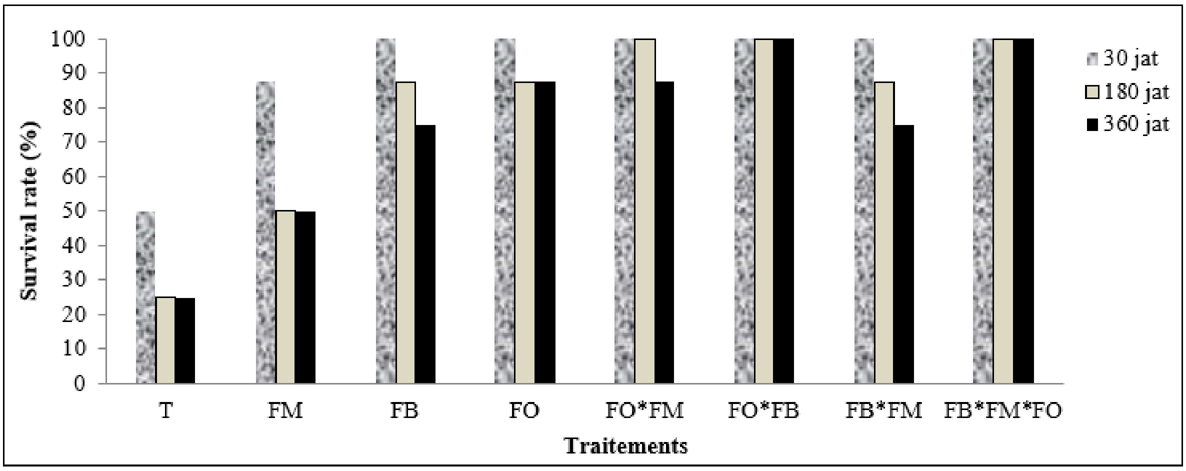

Figure 3: Field survival rate after 1 month

FB= Biological Fertilizer, **FM**= Mineral Fertilizer, **FO**= Organic Fertilizer, **FB*FO**= Biological Fertilizer + Organic Fertilizer, **FB*FM**= Biological Fertilizer + Mineral Fertilizer, **FM*FO**= Mineral Fertilizer + Organic Fertilizer, **FM*FB*FO**= Mineral Fertilizer + Biological Fertilizer + Biological Fertilizer, **T**=Control
; **ja**t = day après transplantation.

4. Discussion

The values obtained with other fertilizers are not statistically different. This high performance would be due to the fact that the initial ground already contained organic matter and even microorganisms that would facilitate the absorption of the mineralized material. Indeed, organic matter has positive effects on the biological activity of the soil and increases the mineral element content of the ground after mineralization [20]. This result goes in the same direction as those of [21] who recorded a very positive effect of cowhouse on plant growth relative to witnesses. In addition, these results are in adequacy with those obtained by [22] found that combined mineral and mycorrhiz fertilizers have a positive effect on the growth of acacia mangium plantations.

Mycorhizien fertilization (FB) It alone has presented high biomasses. These results are consistent with those of Fall and Slack (1991) who have observed stimulation of the increase in the biomass of PinusResinosa plants following mycorrhization with respect to the witness. [23]have shown that there is a factor of effect between the improved nutrition of the mycorrhizated plants and the increase in their biomass. Indeed, the increase in biomass of inoculated plants can be explained by the positive effect of the Mycorrhizes on the mineral and water nutrition of the plant host [24] and on the general health of the plants, resulting in increased strength and the increase in their biomass which allows them to better to ensure environmental stress [25]. Several studies have shown the positive effect of the arbuscularmycorrhizs on the photosynthetic activity. This is the case of [26] who have had an improvement in the photosynthetic activity at *Lactuca sativa* with the inoculation by *Glomusfasciculatum* and [27], where fertilization has significantly increased the photosynthetic potential at *Ipomoea Carnea*. This result highlights the importance of microorganisms in mineral diet and this fact a good water supply of plants in general and that of forest plants such as *Acacia nilotica* in particular. This is given with the conclusions of [28] that mention that endomycorrhizate plants have more follipopical and vigor than those that do not benefit from this symbiosis and are therefore more resistant to biotic and abiotic aggression of their environment. As for FO, the results obtained corroborate those of [29] that noted that tomato plants grown with an organic fertilizer have accumulated a large organic matter content with respect to witnesses. Regarding the foliarity (potential) potential, it varies from - 1.6 MPa (witness) to about - 1.22 MPa (Bis - Fertoger) to - 0.88 MPa (for plants that received F - * FM * FO) formulation. The values of ψF thus found are lower than those found at *A. Albida* (- 0.26 to - 0.53) by Roupardaet al. (1998). This difference would be due to the fact that this species to a reverse phenology of that of all sahelian species such as *A. Nilotica*. In fact, *A. Albida* loses all of its rainfall in the rainy season unlike other species. These values found are also higher than those found by [30] at *A. Nilotica* (- 2.2MPA). This difference would be due to the fact that our study was conducted under the less stressful conditions unlike that of this author that took place in the condition of water stress. Indeed, [31]and [32], mention that plants that have a lower water potential - 1.4 MPa face a severe water deficiency. As for perspiration, it is lower in the control plants (2.77 GH - 1). By comparing the effect of the different fertilizers on the perspiration of the plants, it appears that those who transcend the most are those who have received as fertilizing the triple formulation (6.14 GH - 1), followed by FB * FM, FO * FB and FB (about 5 GH - 1). FO and FO * FM induce a perspiration of about 4 GH - 1 in plants. Plants that received FM transpires the least (2.98 GH - 1). The transpiral values found thus relate to those of [33]on 9 species of Acacia, but below those of [34]at *A. Tortilis*. This difference would be due to the age of subjects studied (younger in this study). In fact, *A. Tortilis* has a very developed root system on the surface with a deep root that allows it to take the water at the level of the tablecloth [35]. Finally, the stomach conductance (GS) goes from 0.35molh2 - 2S - 1 (witness) to 0.63 Molh2OM - 2S - 1 (FO * FB * FM). Those obtained with FB * FM and FO * FB are about 0, 6 Molh2OM - 2S - 1, with Fo * FM and FB, it is about 0.5 Molh2OM - 2S - 1. Between fertilizers, the lowest values were recorded with FM and FO (about 0.4 Molh2OM - 2S - 1). The results found so are in the same direction as those of [36]. This author has shown that the change in food substance could change the stomach conductance of a plant.

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Moreover, mentioned [35], this magnitude that takes into account the total leaf surface of the plants would be better correlated with perspiration. Here again, all fertilizers with mycorrhizes in their formulation have good water status because they are not facing the water stress, transceive more with a good carbon assimilation and a good stomach conductance. Indeed, as mentioned [28], the endomycorhizian fungi are essential to the plant because they play a major role in the prospecting and extraction of soil water to the roots.

Improvement in water efficiency can be explained by the fact that the supply of fertilizers stimulated a good hydromineral feeding plant. Plants, the number of autumnly supplies. [37]mentioned that the speed of stomach response is intrinsically linked to the transportation activity of environmental stimulus.

The physiological parameters followed, are closely linked because the Pearson correlations between each pair of variables gave high correlation coefficients ($R>0.8$; $p = 0.0001$). This result is given with that of [38] that have shown that the absorption of CO_2 (photosynthetic activity) and perspiration are governed by the stomach conductance itself is under the influence of the foliarly water potential. That said, the use of different fertilizers have improved the water and even mineral power supply of young plants since the growth of these planting was positively influenced.

The rate of increase in the diameter of the collar relative to the control plant varies from 9% (with FM) to 28% (with FB * FO * FM). Between bis - fertilizers, it is FB * FM that stands out with a rate of about 27 per bound for mono - fertilizers, it is FO and FB are not significantly different. These results are similar to those of [39] on *JatrophaCurcas* north of Cameroon. They reported that the fertilization of this species has made it more vigorous plants than the witnesses. According to them, the non - fertilized plants of nursery at the time of transplantation undergo a shock that the underlying plants are not known. (Or very little) the fertilized plants. Similarly, [40] found that fertilization improves the resistance of plants to transplantation. This work is also approaching from those of Babacar et al. (2017) noted that non - fertilized jujubers showed significantly higher mortality than fertilized. In addition, they have developed a further development of transplantation of fertilizer jujubers than that of witnesses having not received fertilizer. In general, the results thus obtained are similar to those of [14]on the fertilization of forest plants and specifically to those of [41] which has obtained the same trend at Acacia Spirobis inoculated with the rhizobia. The work of [42] on *Gambeya Lacourtiana* also showed the interest of the use of the nursery of fertilizers. This author noted that the use of organic fertilization results in a better recovery after the controls. These results also confirm those of [43] that noted that the survival of beech plants subject to organic and biological fertilization (ectomycorrhizes) increased compared to witnesses. The variation in the survival rate confirms the results of the follow - up of the physiological parameters. Indeed, according to [37], the plants which ψf is greater than - 0.6mpa are not sensitive to the water deficit, those including - 0.6 <ψf < - 0.9 MPA are less sensitive in the presence of a water deficit so can adapt in the dryer medium. This is the case of plants that have received FB * FO * FM. On the other hand, the others (- 1, 1<ψf < - 1.4 MPa) will be slightly sensitive to the water deficit, which can equally adapt into the drier.

5. Conclusion

The objective of this study was to evaluate the effects of the different types of fertilizers on the *Nicoticanutilipous* plants and after transplantation in the natural environment. It shows that the various fertilizers applied (FO, FB, FM, FO * FB, FO * FM, FB * FM, FO * FM * FB) have had a positive and significant effect both on the agronomic aspect (growth parameters) than on the physiological appearance. Indeed, the growth of the plants having received the different fertilizers is faster than those who have not received fertilizers (witnesses). Of all fertilizers, the measured growth parameters were higher in planting, which were amended with the triple formulation of fertilizers (FO * FM * FB) and, with fertilizers whose mycorrhizes enter into their constitution (FB, FO * FB and FB * FM). This shows the interest of symbiotic microorganisms in the operation (water and mineral feed) of young forest plants as well as for non - woody (herbaceous). Similarly, all fertilizers have improved the water status of planting because they are not facing water stress, transceive more with good carbon assimilation and good stomach conductance. After transplantation in the natural environment, the plants that have received fertilizers have started and one year later, the rate of increase over the witness was greater than 20% for the height even more than 39% with FO * FM * FB and for the diameter of the collar, this rate was greater than 8%. As for the survival rate, only 25% of the controlling plants survived a year after transplantation. Survival rates surrounded by fertilized plants are greater than those obtained in the control plants. Nevertheless, the mineral fertilizer (FM) presented the lowest rate (50%) and the highest rate was raised (100%) with the combination of the three fertilizers (FO * FM * FB). Other fertilizers have allowed to have a survival rate greater than 75%. The best survival rates were identified in planting that have had a better growth and a good physiological state of nursery. These results make us tell that the control of the fertilization of forest plants can be an asset for the improvement of the production of young nursery plants for successful reforestation campaigns.

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