Available online at www.elixirpublishers.com (Elixir International Journal)

Social Studies

Elixir Social Studies 185 (2024) 57195 – 57201

ISSN: 2229-712X

Influence of the Aggressiveness of Weeds on the Production of Six Ecotypes of Brachiaria in Nioka, Ituri Province, DRC

Bofunga, M[1], Lokinda L[2] and Bondombe W.Y [3]
[1]Researcher at INERA – Nioka, DRC
[2,3]IFA –Yangambi, DRC

ARTICLE INFO

Article history:
Received: 14 April 2024;
Received in revised form: 16 May 2024;
Accepted: 28 May 2024;

Keywords
Influence,
Weed Effect,
Production,
Six Brachiaria Ecotypes,
Nioka,
Ituri.

ABSTRACT

A study on the influence of the weed effect on the biomass production of six Brachiaria ecotypes, namely Brachiaria decumbens cv Bazilisk; Brachiaria mulato; Brachiaria brizantha cv Xaraes; Brachiaria ruziziensis; Brachiaria brizantha cv Nioka and Brachiaria brizantha cv Piata at Nioka, was carried out to observe their productivity and identify those with an interesting resilience to the above-mentioned factor.The experimental set-up was that of randomized complete blocks comprising six treatments (six ecotypes mentioned above) and repeated three times. All six Brachiaria ecotypes were subjected to the weed factor. The following parameters were measured: recovery rate and speed, tillering, biomass.The results of the investigations showed that the highest biomass before and after weed invasion was obtained only by B. ruziziensis.

1. Introduction

Forage crops have been and continue to be the subject of various investigations and factors interfering with their productivity such as the effects of trampling, grazing, mowing, burning and weeds (Miles et al., 1996; Arango et al., 2014; Moreta et al., 2014; The harmful effects of the latter are only studied in a substantial and general manner, often deduced in relation to those of cultivated plants (Morel, 1976 cited by Mile et al., 1996).

Brachiaria, one of the most important tropical grasses distributed in the tropics, especially in Africa (Renvoize et al., 1996) has a high biomass production potential and produces nutritious pastures, thereby increasing livestock productivity ((Renvoize et al., 1996; Holmann et al., 2004) It is adapted to drought and low fertility soils, sequesters carbon through its large root system, improves nitrogen use efficiency and subsequently minimizes eutrophication and greenhouse gas emissions (Chenost and Kayouli, 1997 and Grimaud and Thomas, 2002).

In Ituri in general the genus Brachiaria is among the common grassland species but the literature on the effects of grass cover for their productivity in different environments is taciturn if not non-existent. This is the very aim of this article which would like to know the biomass yield and the survival of the six ecotypes of Brachiaria introduced and exploited in the grassland flora of Nioka in order to consider the promotion of those which will have better production resilient to the effects of weeds.

2. Materials and methods

2.1. Environment and location of the test site.

This investigation was carried out in the INERA-Nioka concession (figure 1) from July 2022 to July 2023, i.e. a duration of one year and carried out in Nioka and its surroundings in the territory of Mahagi, the province of Ituri.

Tele:
E-mail address: christophemyonge@gmail.com

In this Station, the tests were carried out at 02° 12' 49.7" North latitude, 030° 38´ 39.5´´ East longitude and at an altitude of 1661 m in part of the food plantation and also next to it from the Brachiaria spp ecotype collection of the Breeding Program.

The figure 1 elucidates the location of our experimental field.

2.1.1. Climate

According to Sys and Hubert (1969), the city of Nioka belongs to the AW2N and AW3N climatic regions defined according to the Käppen classification. The average annual rainfall amounts to 1269 mm spread over 9 months and the average daily temperature being 18.9°C, is more or less constant throughout the year (Ngoy, 1993a).

2.1.2. Vegetation

This environment belongs to the Sudano-Zambézian zone, province of Ituri (Holowaychuk cited by Lebrun, 1969) where we can distinguish savannahs of medium altitude (< 1500m). High altitude savannahs (>1500m) and the Lake Albert savannah zone. The dominant formation of the region is represented by gallery forests and marshy rivers.

2.1.3. Hydrography

The city of Nioka is washed by three rivers including: The Aoda River, The Luluda River and The Shari River.

2.1.4. Ground

The soils of Nioka derive from the product of phyllization of granitoid rocks. This series has its black or very dark gray humus horizon, with a medium sub-angular structure. The non-humus solum is clayey or clayey-sandy, friable with a medium sub-angular structure, very dark reddish brown in color above the dark horizon, and reddish brown above. Granoquartz is present in variable quantities, and determines either the clay type or the clay-sand type (RuhecitedbyNgoy,1993a).

2.2. Material

It is composed of six ecotypes of the Brachiaria genus introduced and exploited in Nioka and its surroundings, notably Brachiaria decumbens cv Basilisk (Bdb), Brachiaria mulato (Bm), Brachiaria brizantha cv Xaraes (Bbx), Brachiaria ruziziensis (Br), Brachiaria brizantha cv Nioka (BbN) and Brachiaria Brizantha cv Piata (Bbp).

2. 3. Methods

2.3.1. Identification of study materials

The study material intended for the experiment was identified in the National Collection of Brachiaria located on the Ndjumali farm next to the Zagu forest reserve at INERA-Nioka and for more precision in this identification stage of Brachiaria ecotypes, the INERA-Nioka herbarium service was very useful.

2.3.2. Acquisition of Brachiaria species

The plants that constituted our study material were harvested at the INERA-Nioka Agrostological Garden using a hoe.

3. Experiment

3.1. Experimental device and treatments

The trial on the evaluation of the production of different ecotypes of the genus Brachiaria spp before and after overgrowth by weeds was conducted according to the experimental design of randomized complete blocks comprising six treatments and three repetitions. Each plot of 5m x 2m, or an area of 10 m2, received 55 shards of stumps installed at spacings of 0.5m x 0.5m, or 0.25m². The 1m aisles separate the plots from each other. The three repetitions were installed at the same time on the side of the same hill. Thus, overall, each device was made up of 990 fragments of stumps and the total area of the field was 342 m2. The figure below illustrates the device used.

3.2 Preparing the Land

This preparation first consisted of mowing the grass using a machete and cutter, and removing the shrubs using a pickaxe and a hoe. The hoe was also used for plowing the land and harrowing clods of plowed land and a rake was used when leveling the land.

3.3 Preparation of propagation material

The strains used being in the vegetative stage were collected using the hoe and transported to the experimental site by vehicle. The preparation of propagation material consisted first of fragmenting the stumps using a machete, followed by dressing them by hand.

3.4. Planting

The 15cm x 15cm x 15cm holes were dug with a hoe and in these, the fragments of the stumps thus obtained were planted at an angle of more or less 60° relative to the plane of the ground. Each pocket included two stump fragments and the spacing was 0.5m in all directions. The rope and the metric tape were used for this work. No soil amendment was applied.

3.5. Crop care

Weeding was the first maintenance treatment after total recovery using a hoe. This was followed by refilling the observed voids and then stripping them to leave only a single stump to be observed later.

3.6 Comments

The main parameters observed were the rate and speed of recovery, tillering, biomass production following the factors constituting the effects of weed.

a) Recovery rate

Evaluated as soon as at least one new leaf or tiller appears at the base of the splinter. While the time required for recovery was evaluated by considering the number of days from which new growths or tillers no longer appeared. The recovery rate is estimated as a percentage while the recovery speed is defined as the number of days necessary for the total recovery of the planted species.

The recovery rate was determined from the following relationship:

$$TR(\%) = \frac{\text{number of flashes having resumed}}{\text{T total number of shards planted}} \times 100 \quad (1)$$

b) Tilling

It is the vegetative propagation capacity for a burst to produce adventitious secondary shoots from nodes at the base of the initial seedling, thus ensuring the formation of dense clumps. For this parameter, the tillers were counted after 1 month to 12 months and the data taken in a register, using the pen.

c) Production

The estimation of biomass production consisted of cutting 15 stumps per experimental unit with a machete. The harvest provided by the sample plants was weighed using a precision balance (Steinberg system SBS – LW 7500A brand) reduced to the plot scale, then extrapolated to the hectare. For each ecotype, the aliquot samples taken were dried in an oven at 105 °C until the constant weight was obtained.

d) Weed effect appearance

Observations were carried out in unmaintained plots invaded by weeds throughout the evaluation period.

e) Tropical cattle unit

To obtain the Tropical Cattle Unit, we considered a 250 kg cattle at maintenance whose daily consumption will conventionally be 6.25 kg DM, which will make it possible to establish a carrying capacity in TLU.

4. Statistical analysis

The Student's t test, one-factorial and two-factorial analysis of variance were used to compare the means and a Bonferoni post hoc test was also used whenever there were differences with the GraphPad software. Prism5 (Graph Pad Software, San Diego, California, USA). The significance level was set at 5%.

5. Results, interpretation and discussion

5.1. Biomass production of Brachiaria ecotypes

5.1.1. Average biomass of Brachiaria ecotypes before disturbance factors

It appears from this figure 3 that under the conditions of Nioka, B. brizantha cv Piata gives a good biomass yield, i.e. (1273.5 kg dm/ ha), followed by B. brizantha cv Xaraes, with (1078 kg dm/ ha), B. decumbens cv Bazilisk (937.7 kg dm / ha), B. brizantha cv Nioka (802.16 kg dm / ha), B. ruziziensis (802.16 kg dm / ha) and comes so B. mulato (648.32 kg dm/ha). These numerical differences were confirmed by the analysis of variance which showed highly significant differences (P = 0.001) between the ecotypes.

However, Bonferroni's post hoc test indicates highly significant differences between B. decumbens cv Bazilisk and B. mulato, B. decumbens cv Bazilisk and B. brizantha cv Bazilisk and B. brizantha cv Nioka, B. decumbens cv Bazilisk and B. brizantha cv Piata, B. mulato and B. brizantha cv B. brizantha cv Xaraes and B. ruziziensis, B. brizantha cv Xaraes and B. brizantha cv Nioka, B. brizantha cv brizantha cv Piata and B. brizantha cv Nioka and B. brizantha cv Piata (P = 0.0001).

Tropical cattle unit

The biomasses obtained for each Brachiaria ecotype were converted into Tropical Bovine Unit (TBU), presented in the table above.

Table 1. Tropical Bovine Unit of Brachiaria ecotypes (Kg)

Ecotypes / Rehearsals	BdB	Bm	BbX	Br	BbN	BbP
1	0,40	0,28	0,48	0,30	0,35	0,55
2	0,41	0,29	0,47	0,29	0,35	0,55
3	0,39	0,25	0,44	0,29	0,36	0,53
4	0,40	0,28	0,44	0,29	0,34	0,56
5	0,41	0,29	0,48	0,31	0,34	0,56
6	0,43	0,28	0,50	0,29	0,35	0,56
Total	**2,44**	**1,67**	**2,81**	**1,77**	**2,09**	**3,31**
Average	**0,40**	**0,27**	**0,46**	**0,29**	**0,34**	**0,55**

Depending on the maintenance requirement for cattle of 250kg live weight (6.25UF) and taking into account the results obtained in the conditions of Nioka, we note that B. brizatha cv Piata produced enough (3.39 TLU), followed by B. brizantha cv Xaraes (2.87 TLU), B. cv. decumbens Basilisk (2.25 TLU), B. brizantha cv Nioka (2.13 TLU),B. mulato (2.02 TLU) and B. ruziziensis (1.83 TLU).

5.2. Effects of weeds on ecotypes.

5.2.1. Resumption of fragments of Brachiaria strains before and after the weed effect.

The results in relation to the recovery rate for this test are shown in Figure 4.

The figure above shows that before plots are invaded by weeds, the rate of recovery of ecotypes observed is generally more varied. The highest rate is observed in B. ruziziensis (92.70%) followed by B. brizantha cv Piata and B. mulato (83.33% each). While the lowest rate is noted in B. brizantha cv Nioka (62.50%).

Analysis of variance revealed a significant difference in recovery rate between these ecotypes (P = 0.00012). The post hoc test confirmed this very significant difference between B. ruziziensis and B. brizantha cv Nioka, B. brizantha cv Nioka and B. brizantha cv Piata, B. mulato and B. brizantha cv Nioka (P < 0.05).

After invasion by weeds, this rate also differs from one ecotype to another and the highest rate is noted in B. brizantha cv Piata (77.08%) followed by B. ruziziensis and B. brizantha cv Nioka (72.91%). While low rates are observed in B. mulato (61.45%) and B. decumbens cv Bazilisk (66.6%). These numerical differences were not confirmed by analysis of variance (P = 0.02).

By comparing the situation before and after the weed effect, the bifactorial analysis indicates significant differences for B. mulato and B. ruziziensis (P < 0.05). The rest of ecotypes did not present significant differences (P = 0.034).

5.2.2. Recovery speed.

The time required for the recovery of different Brachiaria ecotypes before and after the effects of weeds are recorded in Figure 5

From this figure 5, it appears that the fastest recovery occurs in Brachiaria brizantha cv Nioka (9.83 days) followed by B. brizantha cv Xaraes (12.33 days) while it is later in B. decumbens cv Basilisk (17.16 days). The analysis of variance showed highly significant differences between the Brachiaria ecotypes observed (P < 0.0001). The post hoc test indicates highly significant differences between B. decumbens cv Basilisk and B. brizantha cv Nioka, B. mulato, and B. brizantha cv Nioka, B. ruziziensis and B. brizantha cv Nioka and highly significant differences between B. decumbens cv Basilisk and B. brizantha cv Xaraes, B. decumbens cv Basilisk and B. brizantha cv Piata (P = 0.0001).

However, under the effect of weeds, this same figure shows that the fastest recovery is observed in B. brizantha cv Nioka (11 days), followed by B. ruziziensis (13.66 days), B. brizantha cv Piata (14 days), B. brizantha cv Xaraes (15 days), B. decumbens cv Basilisk, avec (16.83 days) and B. mulato (17 days). Very significant differences emerge after analysis of variance between ecotypes (P = 0.0058).

Bonferroni's post hoc test proved significant differences in recovery only between B. decumbens cv Bazilisk and B. brizantha cv Nioka, as well as between B. mulato and B. brizantha cv Nioka, (P < 0 .05).

Comparing the speed before and after the weed effect, the bifactorial analysis indicates no significant difference between the Brachiaria ecotypes (P>0.05).

5.2.3. Cultivation of Brachiaria ecotypes.

The regrowth or tillering of the different ecotypes of Brachiaria spp before and after the effects of weeds are represented in Figure 6.

It appears from this figure 6 that B. brizantha cv Piata has tillered more than the other ecotypes (63.27 tillers) and it is followed by B. mulato (51 tillers) and B. brizantha cv Xaraes (50 tillers). While B. decumbens cv Bazilisk, B. ruziziensis and B. brizantha cv Nioka presented fewer tillers (49) compared to the three. The analysis of variance showed no significant difference between the ecotypes examined (p = 0.99).

Under the effect of weeds, we note that B. brizantha cv Piata has more tillers (118 tillers). It is followed by B. brizantha cv Nioka and B. brizantha cv Xaraes respectively (111 tillers) and finally B. decumbens cv Bazilisk has fewer tillers than all the other ecotypes observed (95 tillers).

Analysis of variance indicates highly significant differences between the tillering averages of these ecotypes (P < 0.0001). The post hoc test indicates highly significant differences between B. brizantha cv Xaraes and B. ruziziensis, B. brizantha cv B. ruziziensis, B. decumbens cv Bazilisk and B. brizantha cv Nioka, significant difference between B. mulato and B. brizantha cv Nioka, B. ruziziensis and B. brizantha cv Piata (P = 0.0001). By comparing tillering before and after the effects of weeds, no significant difference was noted between the ecotypes (P > 0.05).

5.2.4. Biomass of ecotypes of Brachiaria spp.

Figure 7 visualizes the evolution of the productivity of ecotypes of Brachiaria spp for the two seasons before and after, under the effects of weeds.

It appears from the figure above that before the weed effect B. brizantha cv Piata has a higher biomass rate, i.e. 1300.93 Kg dm/ha, it is followed by B. brizantha cv Xaraes (1119, 80 Kg dm/ha) and B. decumbens cv Bazilisk (942.33 Kg dm/ha). The lowest biomass is noted in B. ruziziensis (641.66 Kg dm/ha). Analysis of variance indicates highly significant differences between ecotypes (P = 0.0001). Bonferroni's post hoc test reveals highly significant differences between B. brizantha cv Nioka and B. brizantha cv Piata, B. ruziziensis and B. brizantha cv Piata, B. mulato and B. brizantha cv Piata, B. decumbens cv Bazilisk and B. brizantha cv Nioka, B. decumbens cv Bazilisk and B. ruziziensis, B. decumbens cv Bazilisk and B. mulato, a significant difference between B. mulato and B. brizantha cv Xaraes (P = 0.0001).

After the appearance of weeds, the biomass production is higher in B. brizantha cv Piata (1808.03 Kg dm/ha) followed by B. brizantha cv Xaraes (1702.06 Kg dm/ha), B.

decumbens cv Bazilisk (1585, 46Kg dm/ha), B. brizantha cv Nioka (1564.56Kg dm/ha) and finally B. mulato (1402.13Kg dm/ha) and B. ruziziensis (1443.93Kg dm/ha). Analysis of variance revealed highly significant differences between the biomass means of the ecotypes observed (P = 0.0001). Bonferroni's post hoc test presents highly significant differences between B. brizantha cv Nioka and B. brizantha cv Piata, B. ruziziensis and B. brizantha cv Piata, B. mulato vs B. brizantha cv Piata and very significant differences between B. . decumbens cv Bazilisk and B. brizantha cv Piata, B. mulato and B. brizantha cv Xaraes (P = 0.0001).

By comparing the biomass before and after the weed effects, the bifactorial analysis presents highly significant differences between the productions obtained before and after the weed effects for the ecotypes under observation (P = 0.001).

6. Discussion

6.1 Average biomass of Brachiaria ecotypes before disturbance factors

This research gave the following results: B. brizatha cv Piata comes in first position with (1273.5 Kg dm/ ha), followed by B. brizantha cv Xaraes (1078.16 kg dm/ ha), B. decumbens cv Baslisk (937.75 kg dm/ha), B. brizantha cv Nioka (802.16 kg dm/ha) and B. ruziziensis (689.84 kg dm/ha). These results would be due to the genetic character of each ecotype. Musale (2021) found different results still under Nioka conditions, i.e. B. cv. decumbens Basilisk, 3320.3 Kg ms/ ha, P. purpureum 3175.5 Kg ms/ ha, B. cv. brizantha Piata 2914.5 Kg ms/ ha, B. brizantha cv. Xaraes 2837.5 Kg ms ha and B. ruziziensis 1677.7 Kg ms ha. This difference would be due to the planting period and the intrinsic qualities of the varieties chosen.

Considering these results, B. brizantha cv Piata produces more (3.39 TLU) compared to other ecotypes. The overall average obtained at Nioka without the intervention of disturbance effects is 2.45 TLU. These average TLU requirements are totally lower than those obtained by Ngakpa (2018) in the conditions of Kisangani (17.9 TLU). The difference in maintenance needs observed could be explained by the influence of the environment and altitude.

6.2. Rate and speed of resumption of fragments of Brachiaria strains.

The recovery before and after the effects of weeds for B. ruziziensis was (92.2% and 72.9%). Followed by B. mulato (83.3% and 61.4%). Overall, we see that the average recovery was (79.67% and 69.76%) before and after the effects of weed. This reduction in recovery rate after the effects of weeds is the work of competition between Brachiaria ecotypes and weeds, some of which have a rapid and invasive recovery power than crops.

However, good resistance is revealed in B. brizantha cv Nioka (72.9%) after invasion by weeds. The association of ecotypes with Brachiaria when installing a permanent meadow can help to better control weeds. Which justifies the findings made by Mandret et al. (2000), Klein et al. (2014) and Tendonkeng et al. (2014) who indicate that in a permanent meadow, if there is a fear of a strong emergence of weeds, a good strategy consists of sowing a mixture of species containing either a fast-growing forage grass, for example B. ruziziensis with d other species that settle more slowly, for example Brachiaria humidicola.

The fastest recovery before and after was obtained by B. brizantha cv Nioka (9 and 11 days), followed by B. brizantha cv Xaraes (12 days) before versus 15 days after the effects of weeds. We also see that the fastest recovery is revealed by B. brizantha cv Nioka with 11 days.

The overall average speed before and after the weeds is different, i.e. 13 days before and 14 days after. The speed of recovery after the effects of weeds is influenced by the competition generated by weeds in crops such as B. mulato (17 days) and B. decumbens cv Bazilisk (16 days). Weeds have negative effects on the speed of recovery of the ecotypes under observation and this can have an impact on the vegetative growth of forage, as well as the production of biomass under Nioka conditions. The more or less rapid growth and development of grassland flora also depends on the species of weeds or crops associated with them (Toutain, 1973; Boudet, 1975; Skerman, 1984; Klein et al., 2014).

6.3. Cultivation of Brachiaria ecotypes

As the tillering increased during the year before and after the effects of weeds, we noticed that it was 102 and 123 tillers for B. brizantha cv Piata, followed by B. brizantha cv Nioka (69 and 115 tillers).). These differences in tillering of these ecotypes can only be caused by their different level of resistance to competition from weeds which have stifled the appearance of certain buds around the lower nodes of the main strain (competition for light). Thus, to increase forage production in Nioka under the effect of weeds, it would be necessary to combine crops and good soil preparation when establishing the permanent meadow.

6.4. Biomass of Brachiaria spp ecotypes

The highest biomass production before and after the weed effect was obtained by B. brizantha cv Piata with (1300 and 1808.03 kg dm/ha). We see an increase of 508.03 kg ms after the effects of weeds. Which shows the ability of ecotypes to increase their vegetative development to better control weeds. The overall biomass production in kg of dry matter after weed effect increased by 676 kg. This increase is caused by the presence of decomposing organic matter (dried leaves and debris which fall to the ground) having certainly served as mulch for these ecotypes.

Weeds generally have negative effects on crops. However, they are sometimes beneficial for other grass species like our Brachiaria ecotypes which favored more tillers and obtained high biomass production in their presence. This opinion corroborates the results of Hugenin et al. (2008) on observations undertaken in French Guiana focused on the ability of herbaceous cover to control invasive weed plants in grasslands. This opinion agrees with those of Fisher and Kerridge (1996), Mc Gregor et al. (2009) and Guilloteau (2022) probably stipulated that weeds can in certain cases improve the fertility of grassland soils and induce interesting production. to meadow flora having more or less high resilience and tolerance.

Thus, under the conditions of Nioka B. brizantha cv cv Bazilisk 15166.7 kg dm/ha (6.6 TLU), B. mulato 12291.2 kg dm/ha (5.3 TLU), B. brizantha cv Nioka 11,824.8 kg dm/ha (5.1 UBT) and finally B. ruziziensis 11069 kg dm / ha (4.8 UBT).

The daily requirement of a bovine being 6.25 UF for a bovine of 250kg live weight, the results obtained by B. brizantha cv Xaraes (16931.8 kg dm/ ha) cover the annual requirements of 7.5 cows. Which corroborates the results of Boudet (1984) and Miles et al. (1996).

7. Conclusion

The aim of this investigation was to determine the effect of grass cover on the biomass production of six ecotypes of Brachiaria, notably Brachiaria decumbens cv Bazilisk; Brachiaria mulato;

Brachiaria brizantha cv Xaraes; Brachiaria ruziziensis; Brachiaria brizantha cv Nioka and Brachiaria brizantha cv Piata in Nioka. The experimental design was that of complete randomized blocks comprising six treatments (six ecotypes mentioned above) and repeated three times. The six Brachiaria ecotypes were subjected to the weed disturbance factor. The following parameters were measured: recovery rate and speed, tillering, biomass.

At the end of the investigations the results are that:

- The recovery rate was highest for Brachiaria ruziziensis before and after all disturbance factors. B. brizantha cv Nioka had the lowest recovery rate before and after this disruptive factor.
- The fastest recovery speed is obtained before this factor by B. brizantha Nioka while the slowest speed by B. decumbens cv basilisk.
- The highest tillering is obtained before the aforementioned factor by B. brizantha cv piata and the lowest by B. brizantha cv nioka. After the disturbance factor B. brizantha cv piata produced more tillers while the lowest production was achieved by B. decumbens cv basilisk.
- The highest biomass before and after invasion by weeds is only obtained by B. ruziziensis.

Finally, this article would like subsequent investigations to be able to determine the degree of nuisance effect of weeds on forage plants to assess the performance of the meadow species examined.

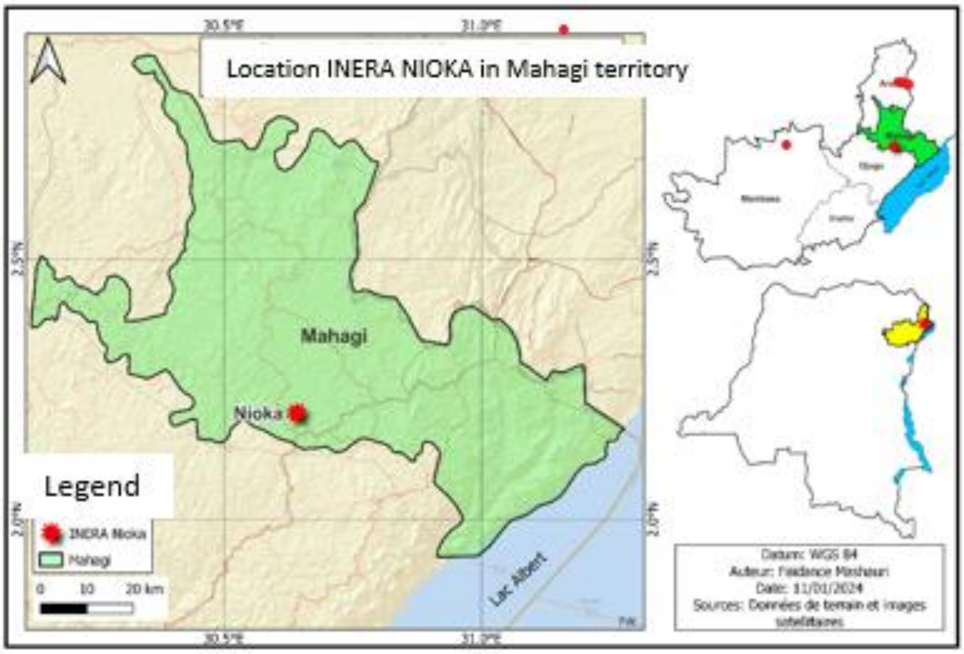

Figure 1. Map of the Mahagi territory locating the experimental site at INERA-Nioka.

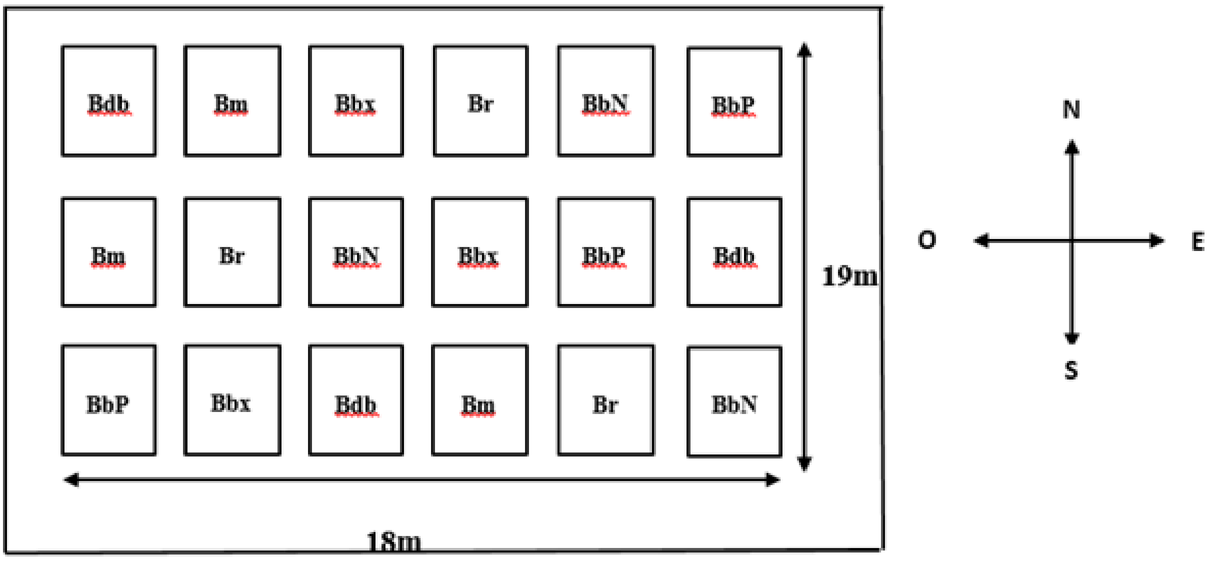

Figure 2. Experimental device used

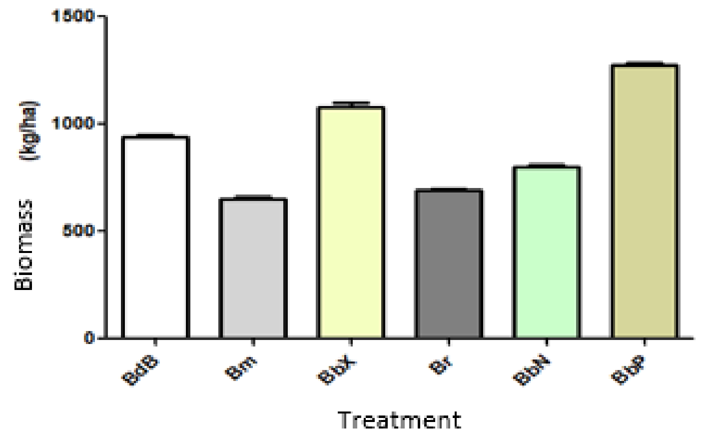

Figure 3. Average biomass production of ecotypes before disturbance factors Legend: Brachiaria decumbens cv Basilisk (Bdb); Brachiaria mulato (Bm); Brachiaria brizantha cv Xaraes (BbX); Brachiaria ruziziensis (Br), Brachiaria brizantha cv Nioka (BbN) and Brachiaria brizantha cv Piata (BbP).

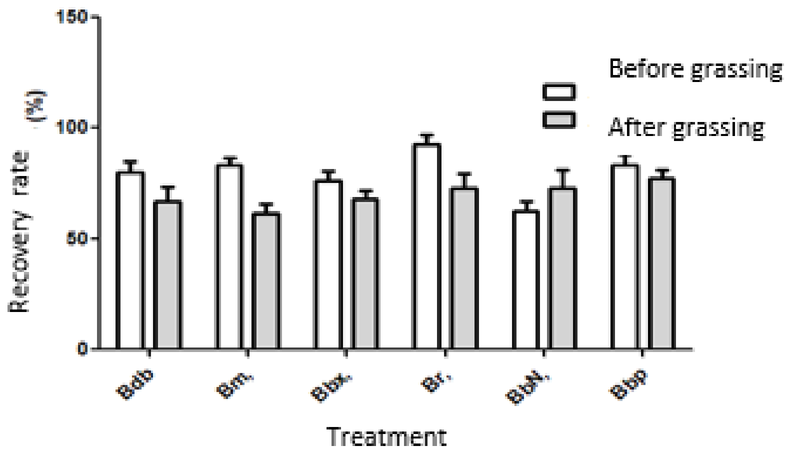

Figure 4. Recovery of stump fragments before and after weed effect. Legend: Brachiaria decumbens cv Basilisk (Bdb); Brachiaria mulato (Bm); Brachiaria brizantha cv Xaraes (BbX); Brachiaria ruziziensis (Br), Brachiaria brizantha cv Nioka (BbN) and Brachiaria Brizantha cv Piata (BbP).

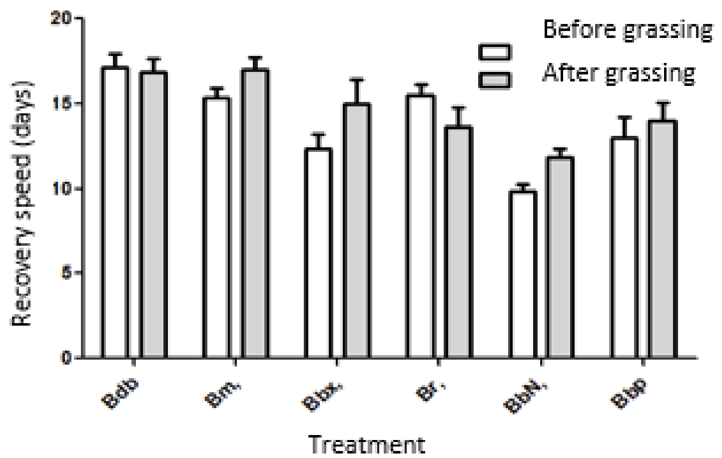

Figure 5. Speed of resumption of strain bursts of Brachiaria ecotypes before and after weed effects Legend: Brachiaria decumbens cv Basilisk (Bdb); Brachiaria mulato (Bm); Brachiaria brizantha cv Xaraes (BbX); Brachiaria ruziziensis (Br), Brachiaria brizantha cv Nioka (BbN) and Brachiaria Brizantha cv Piata (BbP).

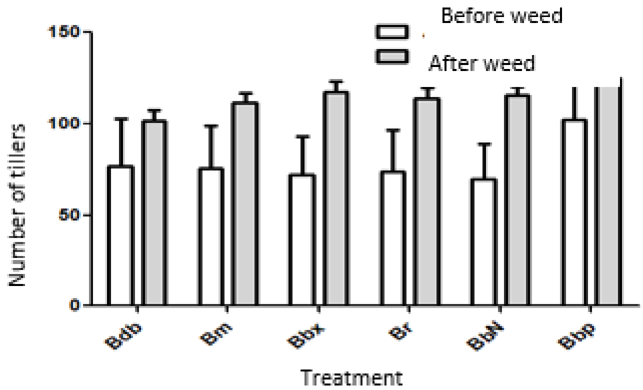

Figure 6. Tilling before and after the effects of weeds Legend: Brachiaria decumbens cv Basilisk (Bdb); Brachiaria mulato (Bm); Brachiaria brizantha cv Xaraes (BbX); Brachiaria ruziziensis (Br), Brachiaria brizantha cv Nioka (BbN) and Brachiaria Brizantha cv Piata (BbP).

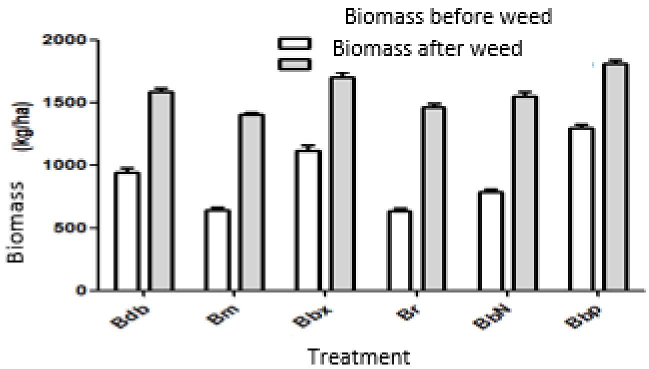

Figure 7. Biomass of Brachiaria spp ecotypes before and after weed effects. Legend: Brachiaria decumbens cv Basilisk (Bdb); Brachiaria mulato (Bm); Brachiaria brizantha cv Xaraes (BbX); Brachiaria ruziziensis (Br), Brachiaria brizantha cv Nioka (BbN) and Brachiaria Brizantha cv Piata (BbP).

References

- Boudet, G., 1984: Manual on tropical pastures and forage crops. 4th ed., Paris, Minister of Cooperation IEMVE, 266p.
- Chenost M. and Kayouli.,1997: Use of roughage in tropical regions. FAO Study-Animal Production and Health No. 135, Rome, FAO, 12p. (www.Fao.org/dorep/W 4988F/WA988F00.htm>.
- Ficher M.J., and Kerridge P.C., 1996: The Agronomy and physiology of Brachiaria species. Brachiaria: Biology, Agronomy, and Improvement (CIAT and Embrapa), pp 43-52.
- Guilloteau. J., 2022: The problem of bush fires and burning in the development and conservation of soils in Africa, south of the Sahara.
- Grimaud P. and Thomas P., 2002. Grass-based feeding systems on cattle farms in Reunion Island. Forage, 44, 202-223.
- Holmann, F., Argel, P., Rivas, L., White, D., Estrada, R.D, Burgos, C., Perez., Ramirez, G., Medium, A., 2004: Benefits and costs of rehabilitation of degraded pasteres in Honduras pastares Tropicales 26(3): 13-18.
- Huguenin J., Laurent N., and Marion S., 2008: Aptitude of the herbaceous cover to control invasive weed plants in the Amazonian grasslands of French Guiana. In: CruzP., Jouany C., and Them J.P., (eds). Tools for managing permanent meadows.
- Klein H.D., Rippstein G., Huguenin J., Toutain B., Guerin H., and Loupe D., 2014: Forage crops. Ed. Quae, CTA, Presse agronomiques de Gembloux, 262p.
- Mandret G., Hassoun P., Paillot J.M., Tilland E. and Blanford V., 2000: Cattle breeding in Reunion - synthesis of fifteen years of research. Montpellier, Cirad, coll. References, 391p.
-Miles J.W., Mass. B.L., and Do valle. C.B., 1996: Brachiaria: Bidogg, Agronomy and Improvement, CIAT, cali, Colombia., 288 P.
- Mc Gregor H.W., Dupont, L.; Stuut, J.B.W.; Kuhlmann, H, 2009: vegetation change, goats and religion: a 2000-year history of land use in southern Moroco. Quaternary science Revius; 28:1434-1448.
- Ngoy. N., 1993: Study of field behavior and performance of local sweet potato varieties Ipomea batatas in the Ituri sub-region, eastern Zaire.
- Return. S.A, Clayton W.D. Kabunga and C.H.S., 1996: Morphology, Taxonomy, and Natural distribution of Brachiaria (Trim.). Gries. Brachiaria: Biology, Agronomy, and Improvement (CIAT and Embrapa) PP.1-12.
- Richard D., Guerin H., and Fall, 1989: Fedds of the dry tropics (Senegal). In: Jarrige R., Ruminant nutrition: recommended allowances and feed tables. Paris, INRA/john Libbery Eurotext, p 325-346.
- Roberge G and Toutain B., 1999: Tropical fodder crops. CIRAD-EMVT. Collection Landmarks, 369 p.
- Tendonkeng, F., Boukila, B. and Pamo, T.E., 2014: Fodder production in tropical Africa: Effect of nitrogen fertilization on the growth, yield and nutritional value of Brachiaria ruziziensis. French-speaking academic presses, Ed.more books, ISBN-13,Paris(France),272p.