Scientia Agraria Paranaensis – Sci. Agrar. Parana.
ISSN: 1983-1471 – Online
DOI: https://doi.org/10.18188/sap.v20i3.27488

PHYTOSOCIOLOGICAL SURVEY OF WEED PLANTS AND THEIR PASTURE CONTROL

Gidean Luz do Carmo Silva[1*], Henrique Toniolo Farias[1], Joaquim de Oliveira Neto[1], Elizene Vargas Borges[1], Pablo Wenderson Ribeiro Coutinho[2]

SAP 27488 Receiced: 31/05/2021 Accepted: 08/09/2021
Sci. Agrar. Paraná., Marechal Cândido Rondon, v. 20, n. 3, jul./sep., p. 266-272, 2021

ABSTRACT - Weeds damage economically interesting crop development, resulting in potential production loss of such crop. Thus, this study had de objective of surveying weeds' phytosociology in *Brachiaria brizantha* (cv. Marandu) pasture and of evaluating the effectiveness of herbicides in mixtures on weeds control. The field studied has been using *B. brizantha* pasture for more than 10 years, divided in 4 areas with 1 ha each. After the first weeds harvest and identification, a mixture of Aminopyralid (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopyr (150 g L^{-1}) 1 L ha^{-1} + 1.5 L ha^{-1} of 2,4-D (2.5 L ha^{-1}), Aminopyralid (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopyr (150 g L^{-1}) 2.0 L ha^{-1} + 1.5 L ha^{-1} of 2,4-D (3.5 L ha^{-1}), Aminopyralid (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopyr (100 g L^{-1}) 1 L ha^{-1} + 1.0 L ha^{-1} of 2,4-D (2 L ha^{-1}). After the harvests, the samples were identified and the following statistics were calculated — absolute frequency, relative frequency, absolute density, relative density, absolute abundance, relative abundance, and importance value index. The obtained phytosociological survey in pasture planting presented five families — Fabaceae, Malvaceae, Asteraceae, Euphorbiaceae, and Solanaceae —, and using Aminopyralid (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopyr (100 g L^{-1}), adding up to a mixture of 1.0 L ha^{-1}, mixed with 1.0 L ha^{-1} of 2,4-D, was effective in the control of weeds in the pasture area.
Keywords: *Brachiaria brizantha* Stapf, management, weeds.

MANEJO QUÍMICO NO CONTROLE DE PLANTAS DANINHAS EM PASTAGEM

RESUMO - As plantas daninhas causam danos no desenvolvimento das culturas de interesse econômico, resultando na redução do potencial de produção das mesmas. Desta forma, este estudo teve como objetivo realizar um levantamento fitossociológico de plantas daninhas em pastagem de *Brachiaria brizantha* (cv. Marandu) e avaliar a eficiência de moléculas de herbicidas em mistura, no controle das plantas daninhas. A área do estudo tem mais de 10 anos de uso com pastagem *B. brizantha*, sendo dividida em 4 áreas com 1 ha cada. Após a primeira coleta e identificação das plantas daninhas aplicou-se uma mistura de Aminopiralide (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopir (150 g L^{-1}) 1 L ha^{-1} + 1,5 L ha^{-1} de 2,4-D (2,5 L ha^{-1}), Aminopiralide (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopir (150 g L^{-1}) 2,0 L ha^{-1} + 1,5 L ha^{-1} de 2,4-D (3,5 L ha^{-1}), Aminopiralide (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopir (100 g L^{-1}) 1 L ha^{-1} + 1,0 L ha^{-1} de 2,4-D (2 L ha^{-1}). Após as coletas, as amostras foram identificadas e em seguida realizado os cálculos frequência absoluta, frequência relativa, densidade absoluta, densidade relativa, abundância absoluta, abundância relativa e o índice de valor de importância. O levantamento fitossociológico obtidos em cultivo de pastagem apresentou a ocorrência de cinco famílias: Fabaceae, Malvaceae, Asteraceae, Euphorbiaceae e Solanaceae e a utilização do Aminopiralide (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopir (100 g L^{-1}), totalizando 1,0 L ha^{-1} de calda, misturado com 1,0 L ha^{-1} de 2,4-D, apresentou eficiência no controle de plantas daninhas na área de pastagem.
Palavras-chave: *Brachiaria brizantha* Stapf, manejo, plantas invasoras.

INTRODUCTION

The animal production system has grown over the years, being Brazil one of the top producers in animal husbandry in the world because the country has the largest commercial bovine herd and one of the top meat producers, with about 214.69 million bovines, herded in 162.18 million hectares of pastures, with occupation rates of 1.32 animal units per hectare and stocking rate of 0.93 (animal units ha^{-1} - ABIEC, 2019).

Pastures in Brazil have been presenting great impact in animal husbandry. The *Brachiaria* genus occupies around 50% of the planted areas due to its low cost for herd feeding when compared to animal confinement systems using grains on their daily feeding. This genus presents excellent adaptation to acid soils and to low natural fertility soils, despite providing high profitability of dry matter per hectare, presenting good development during most of the year, specially in the dry period (BERCHIELLI et al., 2012).

Weeds compete with the economic relevant crop harming the development of the latter, which reduces their production potential (FORTE et al., 2017). Hence, proper

[1]Faculdade UniBras, São José dos Quatros Marcos, MT, Brasil. E-mail: gidean-eng.agronomo@hotmail.com. [*]Corresponding author.
[2]UniAmérica – Centro Universitário, Foz do Iguaçu, PR, Brasil.

pasture management using a chemical method with the use of selective or non-selective herbicides (depending on the area and on the type of weeds found) on the plants initial stage is essential to create a favorable environment during germination and development of the economic relevant crop (COSTA et al., 2018).

However, the phytosociological survey is important to gather knowledge on the populations and the biology of the invader species since it is one of the tools used for management recommendations both in the soil recovery and in the pastures conduction (SANTOS et al., 2014), since the infesting communities end up causing serious harm to the animal husbandry practitioner, bringing on frustration when inadequate chemical control is carried out due to the lack of knowledge about the invader species before starting the area management (MASCARENHAS et al., 2019).

Chemical control is necessary to enable the combination and the diversity of herbicides, making the resistance of plants to a given molecule less probable and contributing with the success of the management and further reduction of weeds (COLBACH et al., 2017) since one of the main current problems of the agricultural sector in the world is the resistance of weeds to some herbicides, creating the need for innovative strategies for management (WALLACE et al., 2019).

Some weed species present isolated tolerance to given herbicides. Thus, the mixture of different herbicides increases the weeds control spectrum due to the action of different molecules (FERREIRA et al., 2017; SANTOS et al., 2020). According to the study carried out by Ferreira et al. (2018), the improper application, be it by using very high or very low doses, or even by using herbicide molecules to which plants are already resistant, can increase their resistance even further, which has caused selection and altering of the biological cycle of many weed biotypes.

Thus, the objective of this work was carrying out a phytosociological survey of weeds in *Brachiaria brizantha* (cv. Marandu) pastures and evaluating the efficiency of mixed herbicide molecules on the control of the weeds found.

MATERIAL AND METHODS

The characterization of the phytosociological study of the weed's community was carried out between February and April of 2021 in the Santo Antônio das Lendas farm (geographical coordinates: 16º 38' 10.5" S; 57º 49' 6.5" W) in the city of Cáceres, State of Mato Grosso, Brazil. The area climate is categorized, according to Köppen, as type *Aw*, megathermal wet tropical savanna, with dry winter, well-distributed rain throughout the year, and hot summer (ALVARES et al., 2013).

The experimental area has been used for more than 10 years for beef cattle with *Brachiaria brizantha* cv. Marandu pasture, managed yearly with the application of a mixture of 3 L ha^{-1} of Picloram herbicide (64 g L^{-1}) + 2,4-D (240 g L^{-1}) in the control of annual and biannual weeds that interfered with the grass development. The area was divided in four parts, comprised of 1 ha in each experimental area. Samplings were taken randomly by throwing a 1 m^2 (0.5 x 0.5 m) square on the grass, 30 times for each 1 ha area, covering the whole 4 ha area, according with the methodology proposed by Oliveira and Freitas (2008). Then, the weeds were tallied and identified according with the literature proposed by Lorenzi (2008).

After the harvesting and identification of the weeds, Aminopyralid (40 g L^{-1}) + 2,4-D (320 g L^{-1}) was applied to the first ha, adding up to a mixture of 3 L ha^{-1}. On the second area, Aminopyralid (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopyr (150 g L^{-1}) was used, adding up to a mixture of 1 L ha^{-1}, mixed with 1.5 L ha^{-1} of 2,4-D (applying 2.5 L of this mixture per hectare). On the third area, Aminopyralid (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopyr (150 g L^{-1}) was applied, adding up to a mixture of 2 L ha^{-1}, mixed with 1.5 L ha^{-1} of 2,4-D (applying 3.5 L of this mixture per hectare) and on the fourth area, Aminopyralid (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopyr (100 g L^{-1}) was used, adding up to a mixture 1.0 L ha^{-1}, mixed with 1.0 ha^{-1} of 2,4-D (applying 2.0 L of this mixture per hectare).

The applications were carried out with the aid of a tractor equipped with a sprayer (BC610 model) with 200 L ha^{-1} mixture throughput, with XT model nozzles, besides the intermediate nozzles (MVI type) in the middle of the application range, main nozzles used in the pasture areas. On each evaluation, the weeds were quantified and identified to establish the total number of individuals and the total plant density per hectare.

After the harvests, the weeds were identified and quantified according to each area of study, for which several statistics were calculated - absolute frequency, relative frequency, absolute density, relative density, absolute abundance, relative abundance, and importance value index - for the most representative species, based on the methodology proposed by Mueller-Dombois and Ellenberg (1974), still being studied by Sackser et al. (2021).

RESULTS AND DISCUSSION

The phytosociological survey of the infesting community presented 11 species of weeds throughout the whole pasture area, distributed over 5 families, as shown in Table 1. The main families found were Fabaceae, with 4 species, and Malvaceae and Asteraceae, with 2 species each. This low number of species found was due to the continuous control of infesting weeds in the area, reducing the harm that could be caused by other species besides proving that such control was not effective for all species in different families growing in the area.

When evaluating the phytosociological parameters obtained from the *Brachiaria brizantha* cv. Marandu pasture for beef cattle being used for 10 years before management in areas 1, 2, 3, and 4, it was verified that the *Croton lobatos* L. (Euphorbiaceae) species was prevalent when compared to other species according to frequency, relative frequency, density, relative density, and importance value index, even though higher abundance was verified for *Calopogonium mucunoides* (Fabaceae) and *Sida crodifolia* (Malvaceae) (area 1), *Senna obtusifolia* (Fabaceae) (area 2), *Sida cordifolia* (Malvaceae) (areas 3 and 4), and *Vernonia polysphaera* (Ateraceae) only in area 3 (Table 2).

TABLE 1 - Family, species, and common name of the identified weed community in *Brachiaria brizantha* cv. Marandu pasture for beef cattle being used for 10 years.

Families	Species	Common names
	Area 1	
Solanaceae	*Sida rhombifolia* L.	Arrowleaf sida
Fabaceae	*Senna obtusifolia* L.	Sicklepod
Malvaceae	*Sida cordifolia* L.	Heart-leaf sida
Malvaceae	*Sida acuta* Burm. F.	Common wireweed
Euphorbiaceae	*Croton lobatos* L.	Rushfoil
Asteraceae	*Vernonia polysphaera* L.	-
Asteraceae	*Bidens alba* L.	Shepherd’s needles
Fabaceae	*Calopogonium mucunoides* Dev.	Calopo
Solanaceae	*Sida cordifolia* L.	Heart-leaf sida
	Area 2	
Solanaceae	*Sida rhombifolia* L.	Arrowleaf sida
Fabaceae	*Senna obtusifolia* L.	Sicklepod
Malvaceae	*Sida cordifolia* L.	Heart-leaf sida
Euphorbiaceae	*Croton lobatos* L.	Rushfoil
Fabaceae	*Crotalaria incana* L.	*Cargadita*
Solanaceae	*Sida cordifolia* L.	Heart-leaf sida
	Area 3	
Solanaceae	*Sida rhombifolia* L.	Arrowleaf sida
Fabaceae	*Senna obtusifolia* L.	Sicklepod
Fabaceae	*Senna obtusifolia* L.	Sicklepod
Malvaceae	*Sida cordifolia* L.	Heart-leaf sida
Malvaceae	*Sida acuta* cv. *carpinifolia* L.	Common wireweed
Euphorbiaceae	*Croton lobatos* L.	Rushfoil
Asteraceae	*Vernonia polysphaera* L.	-
Fabaceae	*Crotalaria incana* L.	*Cargadita*
Solanaceae	*Sida cordifolia* L.	Heart-leaf sida
	Area 4	
Solanaceae	*Sida rhombifolia* L.	Arrowleaf sida
Fabaceae	*Senna obtusifolia* L.	Sicklepod
Fabaceae	*Senna obtusifolia* L.	Sicklepod
Malvaceae	*Sida cordifolia* L.	Heart-leaf sida
Euphorbiaceae	*Croton lobatos* L.	Rushfoil
Solanaceae	*Sida cordifolia* L.	Heart-leaf sida

Source: Silva et al. (2021).

It is worth mentioning that families identified as occurring more in this work are also common in *Brachiaria brizantha* pasture areas (ALMEIDA et al., 2019; CANUTO et al., 2020). When growing *B. brizantha* in the city of *Belém do Pará*, Souza Filho and Mourão (2010) focused the allopathic effect of the extract of the fractions on the germination and development of *Senna obtusifolia* (Fabaceae), *Sida cordifolia* (Malvaceae), and *Vernonia polysphaera* (Asteraceae). Dias et al. (2018), evaluating the phytosociology in *B. brizantha* pasture in agroforestry-pastoral systems, verified that the *S. obtusifolia*, *S. cordifolia*, and *Vernonia* spp. species damaged the agroforestry-pastoral system mainly on the initial development of the root system, severely damaging the vegetative development of the crop.

The Fabaceae family presents high distribution amplitude because the morphophysiological structures of the seeds are easily dispersed. Environmental factors (water, air, men, birds, insects, etc.) can influence the dispersion of some species, besides the symbiotic associations that can happen between the species and nitrogen-fixing bacteria, mainly those of the Rhizobium genus. Those associations enable a better assimilation of compounds of nitrogen, important to the development of plants, easing its colonization mainly in environments with low fertility soils (MORATELLI et al., 2021).

Malvaceae is also easily dispersed by the phenological rhythm observed with seasonal patterns of water availability, being the most widespread determinant factors on the reproduction of plants in areas with tropical climate. Studies in the Sergipe state comparing areas with different seasonality degrees indicated a consistent pattern related to a higher proportion of biotic dispersion and more seasonality related with higher abiotic dispersion in the *Caatinga* (SILVA et al., 2013).

TABLE 2 - Phytosociological parameters obtained by growing *Brachiaria brizantha* cv. Marandu pasture with 10 years of use for beef cattle before the crop management.

Species	F	RF	D	RD	A	RA	IVI
			Area 1				
Sida rhombifolia L.	0.10	8.33	1.00	8.63	9.67	8.01	24.98
Senna obtusifolia L.	0.07	5.56	1.00	8.63	14.50	12.02	26.21
Sida cordifolia L.	0.14	11.11	1.00	8.63	7.25	6.01	25.75
Sida acuta Burm. f.	0.14	11.11	1.00	8.63	7.25	6.01	25.75
Croton lobatos L.	0.52	41.67	3.00	25.89	5.80	4.81	72.37
Vernonia polysphaera L.	0.07	5.56	0.59	5.06	8.50	7.05	17.66
Bidens alba L.	0.10	8.33	1.00	8.63	9.67	8.01	24.98
Calopogonium mucunoides Dev.	0.03	2.78	1.00	8.63	29.00	24.04	35.45
Sida cordifolia L.	0.07	5.56	2.00	17.26	29.00	24.04	46.86
			Area 2				
Sida rhombifolia L.	0.17	13.16	1.00	11.11	5.80	9.57	33.84
Senna obtusifolia L.	0.03	2.63	1.00	11.11	29.00	47.87	61.62
Sida cordifolia L.	0.21	15.79	1.00	11.11	4.83	7.98	34.88
Croton lobatos L.	0.62	47.37	4.00	44.44	6.44	10.64	102.45
Crotalaria incana L.	0.14	10.53	1.00	11.11	7.25	11.97	33.61
Sida cordifolia L.	0.14	10.53	1.00	11.11	7.25	11.97	33.61
			Area 3				
Sida rhombifolia L.	0.10	5.26	1.00	7.14	9.67	13.13	25.54
Senna obtusifolia L.	0.21	10.53	1.00	7.14	4.83	6.57	24.24
Senna obtusifolia L.	0.24	12.28	1.00	7.14	4.14	5.63	25.05
Sida cordifolia L.	0.14	7.02	2.00	14.29	14.50	19.70	41.00
Sida acuta cv. *carpinifolia* L.	0.24	12.28	1.00	7.14	4.14	5.63	25.05
Croton lobatos L.	0.59	29.82	5.00	35.71	8.53	11.59	77.13
Vernonia polysphaera L.	0.07	3.51	1.00	7.14	14.50	19.70	30.35
Crotalaria incana L.	0.10	5.26	1.00	7.14	9.67	13.13	25.54
Sida cordifolia L.	0.28	14.04	1.00	7.14	3.63	4.92	26.10
			Area 4				
Sida rhombifolia L.	0.21	20.00	1.00	14.29	4.83	9.76	44.04
Senna obtusifolia L.	0.28	26.67	1.00	14.29	3.63	7.32	48.27
Senna obtusifolia L.	0.10	10.00	1.00	14.29	9.67	19.51	43.80
Sida cordifolia L.	0.07	6.67	1.00	14.29	14.50	29.27	50.22
Croton lobatos L.	0.28	26.67	2.00	28.57	7.25	14.63	69.87
Sida cordifolia L.	0.10	10.00	1.00	14.29	9.67	19.51	43.80

F = frequency, RF = relative frequency, D = density, RD = relative density, A = abundance, RA = relative abundance, IVI = importance value index.

The Asteraceae family is widespread, being well-represented in tropical, subtropical, and temperate regions and with high adaptability capability of its representatives, which is found in several vegetable formations, predominantly in rural areas in the South of the country, where there is a high diversity of species (CORREIA et al., 2021).

The high occurrence of different weed species of the studied families in *B. brizantha* pasture areas is due to, mainly, the high diasporas production and the high dispersion and establishment capacity in pasture areas, which can compromise the growth of the economically important foraging species (FERNANDES et al., 2021).

In area 1, when analyzing the phytosociological parameters obtained on the growing of *B. brizantha* cv.

Marandu pasture, after the herbicide's mixture (Aminopyralid (40 g L^{-1}) + 2,4-D (320 g L^{-1})), it was possible to observe the prevalence of three different species - *Sida rhombifolia* (Solanaceae), *S. cordifolia* (Malvaceae), and *S. obtusifolia* (Fabaceae) (Table 3). As the herbicides mixture concentration increased (Aminopyralid (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopyr (150 g L^{-1})) and the mixture volume, adding up to 2 L ha^{-1} of mixture, mixed with 1.5 L ha^{-1} of 2,4-D and 1 L ha^{-1} of mixture, the action mechanisms of the herbicides also increased, hence reducing the number of weed species, with exception of *S. rhombifolia* and *S. cordifolia*, resistant to the mixtures of the studied molecules, in areas 2 and 3 (Table 3). This fact can be explained by the fact that the most important species in terms of infestation, in each crop modality, are those that present higher importance value index, as Pitelli (2000) describes. The aforementioned species are resistant to the herbicides due to the biochemical and physiological changes, morphological alterations or phenological changes of specific weed biotypes (FERREIRA et al., 2019).

In area 4, using Aminopyralid (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopyr (100 g L^{-1}), adding up to 1 L ha^{-1} of mixture, mixed with 1 L ha^{-1} of 2,4-D, 100% efficiency of the used herbicides was observed, assuring the action mechanisms activity on the weeds and further presenting no prevalence in the study area (Table 3).

Many cases of resistance to the herbicides mixtures result both in change of the action place of the herbicide or its metabolism increase when there is departmentalization and compartmentalization of the herbicide within the plant (COSTA et al., 2020; COSTA et al., 2021). Even though these general mechanisms are similar to some selectivity mechanisms of crops, which enables them to survive to the exposure to herbicides, specific mechanisms to resist herbicides in several weeds species normally differ substantially from those responsible for the crop's selectivity (FERREIRA et al., 2018). These mechanisms responsible for most cases of resistance of growth regulators encompass changes on the herbicide action places, having a photosynthetic inhibition action mode (COSTA et al., 2021).

For most weeds, the resistance is due to mutations that change the place of action of the growth regulators in the thylakoid membrane in the chloroplast (CRUZ et al., 2016). Resistant weeds stand many times (frequently above 100 times) the herbicide dose normally recommended for its control. The differential metabolism is an important selectivity mechanism of weeds against herbicides. Many biotypes developed resistance to herbicides due to their capacity to quickly degrade and/or associate the herbicide with less toxic components (FERREIRA et al., 2018).

Studies indicate that compartmentalization can be responsible, at least partially, for some cases of herbicide resistance. Compartmentalization can be achieved by the storage of these herbicides or of their toxic metabolites in the cell vacuole or tissues distant from the herbicide action points. This type of mechanism has been suggested as one of the more important in the weed's resistance to certain types of herbicides, excluding them from the action point in the chromoplast (FERREIRA et al., 2017; FERREIRA et al., 2018).

TABLE 3 - Phytosociological parameters obtained by growing *Brachiaria brizantha* cv. Marandu pasture with 10 years of use for beef cattle after crop management with herbicides mixtures.

Species	Area 1						
	Aminopyralid (40 g L^{-1}) + 2,4-D (320 g L^{-1})						
	F	RF	D	RD	A	RA	IVI
Sida rhombifolia L.	0.03	16.67	0.10	23.08	3.00	40.00	79.74
Senna obtusifolia L.	0.07	33.33	0.24	53.85	3.50	46.67	133.85
Sida cordifolia L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sida acuta Burm. f.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Croton lobatos L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vernonia polysphaera L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bidens alba L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Calopogonium mucunoides Dev.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sida cordifolia L.	0.10	50.00	0.10	23.08	1.00	13.33	86.41
	Area 2						
	Aminopyralid (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopyr (150 g L^{-1}), adding up to 1 L ha^{-1} of mixture, mixed with 1.5 L ha^{-1} of 2,4-D						
Sida rhombifolia L.	0.14	100.00	0.21	100.00	1.50	100.00	300.00
Senna obtusifolia L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sida cordifolia L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Croton lobatos L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crotalaria incana L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sida cordifolia L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Continuation of Table 3 - Phytosociological parameters…

	Area 3						
	Aminopyralid (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopyr (150 g L^{-1}), adding up to 2 L ha^{-1} of mixture, mixed with 1.5 L ha^{-1} of 2,4-D						
Sida rhombifolia L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Senna obtusifolia L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Senna obtusifolia L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sida cordifolia L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sida acuta cv. *carpinifolia* L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Croton lobatos L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vernonia polysphaera	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crotalaria incana L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sida cordifolia L.	0.07	100.00	0.17	100.00	2.50	100.00	300.00
	Area 4						
	Aminopyralid (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopyr (100 g L^{-1}), adding up to 1 L ha^{-1} of mixture, mixed with 1 L ha^{-1} of 2,4-D						
Sida rhombifolia L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Senna obtusifolia L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Senna obtusifolia L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sida cordifolia L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Croton lobatos L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sida cordifolia L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00

F = frequency, RF = relative frequency, D = density, RD = relative density, A = abundance, RA = relative abundance, IVI = importance value index.

The obtained results, regarding the knowledge of the most important weeds species in pastures, can help the management of these species in a given area since animal husbandry practitioners seek to avoid the dispersion of the most aggressive species that can harm the green mass production for the cattle. Future studies will consider exploring similar conditions in other regions, with different soil types and different pastures, besides evaluating the dry mass of weeds with the objective of implementing the obtained results.

CONCLUSIONS

The phytosociological survey obtained for *Brachiaria brizantha* pasture culture presented the occurrence of five families: Fabaceae, Malvaceae, Asteraceae, Euphorbiaceae, and Solanaceae.

The usage of Aminopyralid (50 g L^{-1}) + Picloram (100 g L^{-1}) + Triclopyr (100 g L^{-1}) mixed together and resulting in an 1.0 L ha^{-1} solution, mixed with 1.0 L ha^{-1} of 2,4-D was effective on the control of weeds in the pasture area.

REFERENCES

ABIEC. ASSOCIAÇÃO BRASILEIRA DAS INDUSTRIAS EXPORTADORAS DE CARNE. **Perfil da pecuária no Brasil.** Relatório Anual 2019. Available at: <http://abiec.siteoficial.ws/images/upload/sumario-pt-010217.pdf>. Access in: 23 set 2021.

ALMEIDA, U.O., ANDRADE NETO, R.C., MARINHO, J.T.S., GOMES, R.R., OLIVEIRA, J.R., SANTOS, R.S., TEIXEIRA JÚNIOR, D.L.; ARAÚJO, J.C. Fitossociologia de plantas daninhas em cultivo de açaizeiro. **Revista Brasileira de Agropecuária Sustentável**, v.9, n.3, p.59-67, 2019.

ALVARES, C.A.; STAPE, J.L.; SENTELHAS, P.C.; GONÇALVES, J.L.M.; SPAROVEK, G. Köppen's climate classification map for Brazil. **Meteorologische Zeitschrift**, v.22, n.6, p.711-728, 2013.

BERCHIELLI, T.T.; MESSANA, J.D.; CANESIN, R.C. Produção de metano entérico em pastagens tropicais. **Revista Brasileira de Saúde e Produção Animal**, v.13, n.4, p.954-968, 2012.

CANUTO, R.S.O., CANUTO, D.M.F., OLIVEIRA, L.S., JACOBI, N.M.N.S.; RIBEIRO NETO, J.C. Levantamento fitossociológico de plantas daninhas em área de produção de café catuaí amarelo. **Revista Inova Ciência & Tecnologia**, v.6, n.1, p.18-23, 2020.

COLBACH, N.; FERNIERI, A.; LE CORRE, V.; MESSÉAN, A.; DARMENCY, H. Simulating changes in cropping practises in conventional and glyphosate-tolerant maize. I. Effects on weeds. **Environmental Science and Pollution Research**, v.24, n.12, p.11582-11600, 2017.

COSTA, N.V.; FERREIRA, S.D.; KUHN, V.G.; GIBBERT, A.M.; CANAVESSI, H. Chemical management of weeds in cassava crop, cultivar 'Santa Helena'. **Revista Ceres**, v.68, n.1, p.569-578, 2021.

COSTA, N.V.; COSTA, A.C.P.R.; COELHO, E.M.P.; FERREIRA, S.D.; BARBOSA, J.A. Métodos de controle de plantas daninhas em sistemas orgânicos: breve revisão. **Revista Brasileira de Herbicidas**, v.17, n.2544, 2018.

COSTA, N.V.; SALVALAGGIO, A.C.; FERREIRA, S.D.; BARBOSA, J.A.; GIBBERT, A.M. Sequential application of herbicides alone and in mixture witht and without folia fertilizer after pruning of Cassava plants. **Planta Daninha**, v.28, n.1, p.1-10, 2020.

CORREIA, J.S.; LYRA-LEMOS, R.P.; RIBEIRO, R.D.T.M.; BEZERRA, M.I. Diversidade florística dos afloramentos rochosos da Reserva Biológica de Pedra Talhada, Quebrangulo, Alagoas. **Revista Brasileira de Geografia Física**, v.14, n.2, p.743-757, 2021.

CRUZ, R.A.; BARRO, F.; DOMÍNGUEZ-VALENZUELA, J.A.; PRADO, R. Physiological, morphological and biochemical studies of glyphosate tolerance in Mexican Cologania (*Cologania broussonetii* (Balb.) DC.). **Plant Physiology and Biochemistry**, v.98, n. 1, p.72-80, 2016.

DIAS, R.C.; SANTOS, M.V.; FERREIRA, E.A.; BRAZ, T.G.S.; FIGUEIREDO, L.V.; CRUZ, P.J.R.; SILVA, L.D. Fitossociologia em pastagem degradada e renovada com sistemas agrossilvipastoris. **Planta Daninha**, v.36, e018174800, 2018.

FERNANDES, M.M.; SILVA, J.C.C.; OLIVEIRA, C.M.; OLIVEIRA, D.D.S.; SANTOS, C.; SIQUEIRA PINTO, A.; SANTOS, M.P.; ARAÚJO FILHO, R.N. Chuva de sementes em dois fragmentos de mata atlântica com diferentes níveis de degradação na Região Nordeste do Brasil. **Acta Biológica Catarinense**, v.8, n.3, p.83-93, 2021.

FERREIRA, S.D.; BARBOSA, J.A.; CORDEIRO, N.K. Germination and emergence of *Digitaria insularis* (L.) Fedde susceptible and resistant to glyphosate. **Journal of Experimental Agriculture International**, v.38, n.1, p.1-7, 2019.

FERREIRA, S.D.; EXTECKOETTER, V.; GIBBERT, A.M.; BARBOSA, J.A.; COSTA, N.V. Biological cycle of susceptible and glyphosate-resistant sourgrass biotypes in two growth periods resistentes. **Planta Daninha**, v.36, n.1, p.1-9, 2018.

FERREIRA, S.D.; SALVALAGGIO, A.C.; MORATELLI, G.; VASCONCELOS, E.D.; COSTA, N.V. *Commelina* species control with desiccants alone and in mixtures. **Planta Daninha**, v.35, n.1, p.1-9, 2017.

FORTE, C.T.; BASSO, F.J.M.; GALON, L.; AGAZZI, L.R.; NONEMACHER, F.; CONCENÇO, G. Habilidade competitiva de cultivares de soja transgênica convivendo com plantas daninhas. **Revista Brasileira de Ciências Agrárias**, v.12, n.2, p.185-193, 2017.

LORENZI, H. **Plantas daninhas do Brasil:** terrestres, aquáticas, parasíticas e tóxicas. 4ª ed. Nova Odesa, SP. Instituto Plantarum. 2008 640p.

MASCARENHAS, M.H.T.; VIANA, M.C.M.; LARA, J.F.R.; BOTELHO, W.; FREIRE, F.M.; MACÊDO, G.A.R. Flora infestante em pastagem degradada sob recuperação, pelo sistema de integração lavoura-pecuária, em região de cerrado. **Revista Brasileira de Milho e Sorgo**, v.8, n.1, p.41-55, 2019.

MORATELLI, G.; FERREIRA, S.D.; CANAVESSI, H.; FEY, E.; RANGEL, M.A.S.; COSTA, N.V. Weed Interference on growth and leaf nutrient accumulation in two cassava varieties. **Journal of Agricultural Studies**, v.9, n.1, p.91-111, 2021.

MUELLER-DOMBOIS, D.; ELLENBERG, H. **Aims and methods of vegetation ecology.** John Wiley & Sons. 1974.

OLIVEIRA, A.R.; FREITAS, S.P. Levantamento fitossociológico de plantas daninhas em áreas de produção de cana-de-açúcar. **Planta Daninha**, v.26, n.1, p.33-46, 2008.

PITELLI, R.A. Estudos fitossociológicos em comunidades infestantes de agroecossistemas. **Journal of Consherb**, v.1, n.2, p.1-7, 2000.

SACKSER, G.A.B.; BARBOSA, J.A.; ECHER, M.M.; ALVES, T.N. Levantamento fitossociológico de plantas daninhas em cultivo de couve-folha em consorciação com quiabeiro em sistema de produção orgânico. **Research, Society and Development**, v.10, n.2, e2910212071, 2021.

SANTOS, J.A.; FREITAS, F.C.L.; SANTOS, I.T.; SILVA, D.C.; DE LA CRUZ, R.A.; FERREIRA, L.R. Uso do Fertiactyl Pós® na proteção de plantas de Eucalipto submetido à deriva de herbicidas. **Planta Daninha**, v.38, n.1, p. 1-8, 2020.

SANTOS, L.D.T; SANTOS, I.C.; OLIVEIRA, C.H.; SANTOS, M.V.; FERREIRA, F.A.; QUEIROS, D.S. Levantamento fitossociológico em pastagens degradadas sob condições de várzea. **Planta Daninha**, v.22, n.3, p.343-349, 2014.

SILVA, A.C.C.; PRATA, A.P.N.; MELLO, A.P.; SANTOS, A.C.A.S. Síndromes de dispersão de Angiospermas em uma Unidade de Conservação na Caatinga, SE, Brasil. **Hoehnea**, v.40, n.4, p.601-609. 2013.

SOUZA FILHO, A.P.S.; MOURÃO Jr., M. Padrão de resposta de *Mimosa pudica* e *Senna obtusifolia* à atividade potencialmente alelopática de espécies de Poaceae. **Planta Daninha**, v.28, n. esp., p.927-938, 2010.

WALLACE, J.M.; CURRAN, W.S.; MORTENSEN, D.A. Cover crop effects on horseweed (*Erigeron canadensis*) density and size inequality at the time of herbicide exposure. **Weed Science**, v.67, n 3, p.327-338, 2019.