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BRS Capiaçu grass as a sustainable alternative for animal feed on family farms: An integrative literature review

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A B S T R A C T

BRS Capiaçu grass (*Pennisetum purpureum* Schum. cv. BRS Capiaçu) It is an elephant grass cultivar developed by Embrapa, characterized by high biomass production potential, good nutritional value, and adaptation to different soil and climate conditions. This study aimed to conduct an integrative literature review on the benefits and challenges of using BRS Capiaçu grass as forage in family farms, as well as its contribution to the economic, social, and environmental sustainability of these production systems. The bibliographic research was carried out in the ALICE, BDPA, SciELO, Web of Science, ScienceDirect, and Google Scholar databases, with data collected between January and December 2025. To improve the effectiveness of the results, the PCC protocol was used. Initially, 4,880 records were identified, of which 18 publications were selected after applying the inclusion and exclusion criteria. The publications were organized into the following categories: origin, physiology, and plant requirements; use of BRS Capiaçu grass as forage; BRS Capiaçu grass silage; economic aspects of cultivation; nutritional value for cattle feed; social and cultural sustainability; and challenges and limitations of cultivation. Overall, the studies analyzed indicate that BRS Capiaçu grass has high productive potential, adapts well to different management systems, and is viable for use on small and medium-sized farms, especially in cattle farming. However, its efficient use depends on proper management, fertilization, correct choice of cutting age, use of additives in silage, and technical assistance for producers.

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R E S U M O

O capim BRS Capiaçu (*Pennisetum purpureum Schum*. cv. BRS Capiaçu) é uma cultivar de capim-elefante desenvolvida pela Embrapa, caracterizada pelo elevado potencial de produção de biomassa, bom valor nutritivo e adaptação a diferentes condições edafoclimáticas. Objetivou-se, com este estudo, realizar uma revisão integrativa da literatura sobre os benefícios e desafios da utilização do capim BRS Capiaçu como forragem em propriedades familiares, bem como sua contribuição para a sustentabilidade econômica, social e ambiental desses sistemas produtivos. A pesquisa bibliográfica foi realizada nas bases ALICE, BDPA, SciELO, Web of Science, ScienceDirect e Google Acadêmico, com levantamento realizado entre janeiro e dezembro de 2025. Para melhorar a eficácia dos resultados foi utilizado o protocolo PCC. Foram identificados inicialmente 4.880 registros, dos quais 18 publicações foram selecionadas após a aplicação dos critérios de inclusão e exclusão. As publicações foram organizadas nas seguintes categorias: origem, fisiologia e exigências da planta; uso do capim BRS Capiaçu como forragem; silagem do capim BRS Capiaçu; aspectos econômicos do cultivo; valor nutritivo para alimentação bovina; sustentabilidade social e cultural; e desafios e limitações do cultivo. De modo geral, os estudos analisados indicam que o capim BRS Capiaçu apresenta alto potencial produtivo, boa adaptação a diferentes sistemas de manejo e viabilidade para uso em pequenas e médias propriedades, especialmente na bovinocultura. Entretanto, seu aproveitamento eficiente depende de manejo adequado, adubação, escolha correta da idade de corte, uso de aditivos na ensilagem e assistência técnica aos produtores.

Palavras-Chave:
Plantas forrageiras, Semiárido, Bovinocultura, Sustentabilidade, *Pennisetum purpureum* Schum

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Introduction

The sustainability of family-based livestock production systems is directly related to their ability to ensure a consistent feed supply for livestock, particularly during periods of reduced forage availability. In this context, selecting productive forage species that are adapted to local conditions and suitable for conservation represents an important strategy for reducing dependence on externally purchased feed and increasing the stability of production systems. Among the available alternatives, elephant grass stands out as a perennial species recognized for its high biomass production potential and its suitability for use as chopped forage or silage (Rosa et al., 2019).

The BRS Capiaçu cultivar (*Pennisetum purpureum* Schum. cv. BRS Capiaçu), developed by the Brazilian Agricultural Research Corporation (*Empresa Brasileira de Pesquisa Agropecuária* - Embrapa), exhibits high biomass production capacity, good nutritional value, and characteristics that facilitate harvesting and mechanization. It can be used either as fresh forage, chopped and provided in feeding troughs, or for silage production, allowing feed reserves to be established for periods of reduced pasture availability (Pereira et al., 2021).

Despite its productive potential, the performance of this cultivar depends on establishment and management conditions. Factors such as soil fertility and drainage, water availability, fertilization, cutting age, and intended use influence forage productivity and nutritional value. For silage production, additional factors must be considered, including dry matter content at harvest, forage processing, compaction, and the potential use of additives. Therefore, the adoption of BRS Capiaçu should not be based solely on its high biomass production but also on the suitability of management practices to farm conditions and the nutritional requirements of livestock (Pereira et al., 2016; Pereira et al., 2021).

These characteristics make BRS Capiaçu a potentially valuable alternative for family farms, where land availability, feed costs, labor, infrastructure, and access to technical assistance may influence the adoption of forage technologies. However, information on this cultivar is scattered across studies addressing different aspects, including establishment, fertilization, cutting age, productivity, nutritional composition, silage production, and its use in cattle feeding. Furthermore, evidence directly assessing its economic, social, and environmental implications in family-based production systems remains limited.

In this regard, conducting an integrative review makes it possible to compile and critically analyze the available evidence, identify similarities and limitations across studies, and recognize gaps that require further investigation. Thus, this study aimed to conduct an

integrative literature review on the benefits and challenges of using BRS Capiaçu elephant grass as a forage alternative on family farms, considering its productive, nutritional, economic, social, and environmental aspects, as well as the main factors associated with its cultivation, management, and conservation.

Methodological Procedures

This study is characterized as an integrative literature review, a method that allows evidence from studies employing different methodological designs to be gathered, critically evaluated, and synthesized, providing a comprehensive understanding of the phenomenon under investigation. Conducting this type of review requires systematic and transparent procedures for formulating the guiding research question, searching for and selecting publications, evaluating and analyzing data, and presenting the synthesis of knowledge (Ganong, 1987; Whittemore; Knafl, 2005; Mendes; Silveira; Galvão, 2008 and Mattos, 2015).

The guiding research question was structured according to the PCC framework, in which “P” refers to Population, the first “C” to Concept, and the second “C” to Context. The population comprised family farms and family-based livestock production systems; the concept focused on the use of BRS Capiaçu elephant grass as a forage resource, including its productive, nutritional, economic, social, and environmental aspects, as well as its limitations; and the context encompassed cattle feeding and forage production on family farms, particularly under tropical and semi-arid conditions.

Based on this framework, the following guiding research question was formulated: What evidence is available regarding the benefits, challenges, and productive, nutritional, economic, social, and environmental contributions of using BRS Capiaçu elephant grass on family farms?

The literature search was conducted between January and December 2025, covering publications available from 2019 to 2025. Searches were performed in the following databases: Web of Science, ScienceDirect, SciELO, Google Scholar, ALICE - Embrapa's Open Access to Scientific Information Repository, and BDPA - Embrapa's Agricultural Research Database.

The information sources were selected based on their thematic scope, coverage of scientific and technical literature in Agricultural Sciences, and complementary roles in retrieving relevant publications. SciELO was included because it provides access to scientific journals, particularly from Latin America, with extensive coverage of studies related to animal production and forage plants. Web of Science and ScienceDirect were used to broaden the retrieval of indexed national and international scientific articles. ALICE and BDPA were selected because they provide access to scientific, technical, and institutional publications from Embrapa, the institution responsible for developing the BRS Capiaçu cultivar. These sources enabled the identification of technical communications, bulletins, and applied studies that are

not always indexed in conventional bibliographic databases. Google Scholar was used as a supplementary source to identify academic studies, technical publications, and gray literature potentially relevant to the guiding research question.

The searches were conducted using independent search strategies to maximize the retrieval of publications related to the topic. The following combinations of terms were employed: "forage plants" (*plantas forrageiras*) AND "semi-arid" (*semiárido*); "Capiaçu (*Pennisetum purpureum* Schum.)"; and "cattle farming" (*bovinocultura*) AND "sustainability" (*sustentabilidade*) AND "Capiaçu (*Pennisetum purpureum* Schum.)". The terms were used individually or combined using Boolean operators, as presented in Table 1. Each search strategy was adapted to the search features and specific characteristics of the sources consulted. For each source, the search string, filters applied, search date, and number of records retrieved were documented.

Table 1.

Search strategies applied and number of records identified in the consulted information sources.

Search strategies	Web of Science	ScienceDirect	SciELO	Google Scholar	ALICE - Open Access to Scientific Information from EMBRAPA	Agricultural research database
"Forage plants" AND "semi-arid"	674	1,579	09	1,140	125	23
"Capiaçu" OR "*Pennisetum purpureum* Schum"	403	379	01	21	28	03
"Cattle farming" AND "sustainability" AND "Capiaçu" OR "*Pennisetum purpureum* Schum"	207	274	0	07	07	0
Quantities	1,284	2,232	10	1,168	160	26
Total		4,880				

Source: Prepared by the authors (2026).

Primary studies of an experimental or observational nature, field experience reports, papers published in conference proceedings, and technical or institutional publications that presented original data, practical experience results, or information directly related to the cultivation, management, conservation, and use of BRS Capiaçu grass in animal feed, published up to 2025, were included.

Duplicate studies, publications outside the established period, materials not available in full, studies that did not directly address BRS Capiaçu grass or its use in animal feed, as well as narrative, integrative, or systematic reviews, meta-analyses, editorials, opinion pieces, and publications that did not present original data or experiences directly related to the guiding question were excluded.

Duplicate studies, publications outside the set period, materials not available in full, works that did not address the proposed topic, publications unrelated to animal feed, cattle farming, silage, forage management, or sustainability, as well as studies that did not provide a direct contribution to answer the guiding question, were excluded.

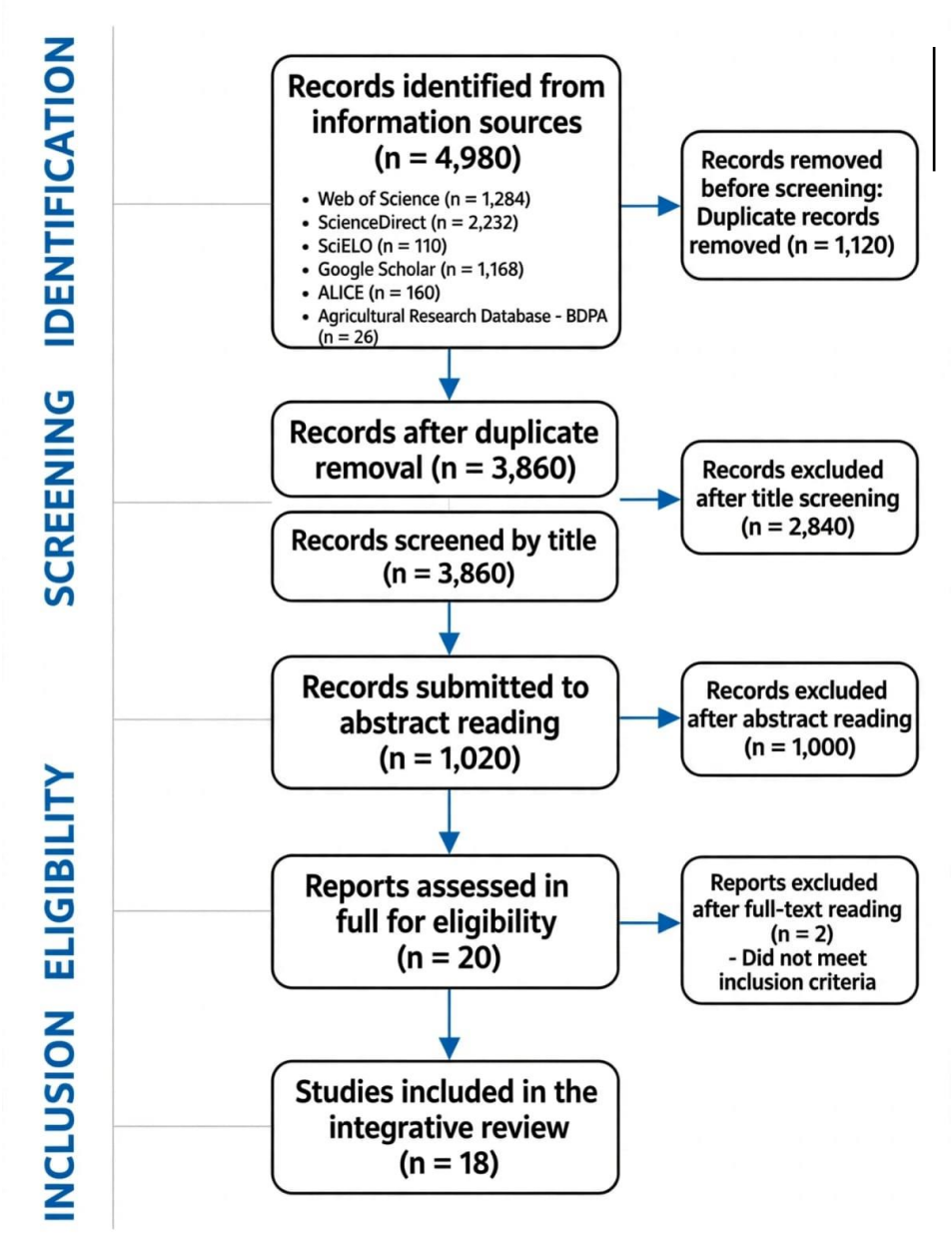
The initial search resulted in 4,880 records found in the consulted databases. After identifying the studies, an initial screening was carried out, removing duplicates and reading the titles. Next, the abstracts, objectives, and, when necessary, the full text were read to check whether the publications met the inclusion and exclusion criteria. The publications considered eligible were read in full, and those that were directly related to the review topic were selected.

After the final selection, the included publications were organized in a data extraction matrix, containing the following information: Author(s), year of publication, title, objective, method, and main conclusions. Later, the studies were analyzed descriptively and grouped by thematic similarity, considering the main aspects addressed in each publication.

The analysis of the publications made it possible to organize the results into the following thematic categories: Origin, physiology, and plant requirements; use of BRS Capiaçu grass as forage; BRS Capiaçu grass silage; productive and economic aspects of cultivation; nutritional value for cattle feed; sustainability in family farms; and challenges and limitations of cultivating Capiaçu.

Figure 1.

Flowchart with the databases and the descriptors according to the guiding question.



Source: Prepared by the authors (2026).

Results

Of the 4,880 records identified from the information sources, 3,860 remained after removing duplicates. After screening by titles and abstracts, 20 publications were assessed in full, of which 18 met the eligibility criteria and made up the *corpus* of this integrative review (Figure 1). The characteristics of the included publications are presented in Table 1.

Table 1.

Selected studies included in the review.

Author(s)/year	Title	Goal	Method	Conclusions
Paula et al. (2020).	Bromatological composition of elephant grass silage BRS Capiaçu with cornmeal inclusion.	Evaluate the fermentative losses and the quality of elephant grass (*Pennisetum purpureum* Schum) cv. BRS Capiaçu silage with different levels of corn meal, with the treatments being 0, 5, 10, 15, and 20% corn.	The experiment was conducted in the Animal Science department at the Federal Institute of Science and Technology of Southeast - MG, Rio Pomba Campus (*Instituto Federal de Ciência e Tecnologia do Sudeste-MG Campus Rio Pomba*).	The use of cornmeal reduced gas losses, effluent losses, and improved dry matter recovery (P<0.05). Using increasing levels of cornmeal decreased fermentative losses and, as a result, improved the nutritional value of elephant grass silage. It's recommended to include more than 10% cornmeal.
Retore et al. (2020).	Silage quality of elephant grass BRS Capiaçu.	Evaluate the quality of elephant grass silage BRS Capiaçu at three cutting ages and three doses of nitrogen fertilization, with the inclusion of 15% crushed corn.	The experiment is part of a project that lasted 1 year, where doses of 0 kg of N/ha/year, 100 kg of N/ha/year, and 200 kg of N/ha/year were applied in the form of urea after each cut, and, at the end, a silage test was carried out.	It is possible to use BRS Capiaçu at 60 days of age for silage production to take advantage of its better chemical composition, as long as at least 15% of crushed corn grain is added to the material to be ensiled, to increase the dry matter content.
Retore et al. (2021).	Management of BRS Capiaçu grass to combine productivity with quality.	Identify the effect of cutting age and nitrogen fertilization on the biomass production and nutritional value of the BRS Capiaçu cultivar.	The experiment was carried out in partnership between Embrapa Western Livestock and the Federal University of Grande Dourados (*Universidade Federal da Grande Dourados*), in Dourados, MS, from	The elephant grass cv. BRS Capiaçu was developed to be used for silage production or chopped green in the trough. Its main advantage is high productivity.

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			August 2017 to September 2018.	
Proença et al. (2022).	Nutritional value of elephant grass silage (*Pennisetum purpureum* Schum) cv. BRS Capiaçu with different additives and inoculants.	Evaluate the bromatological composition of elephant grass (*Pennisetum purpureum* Schum) cv. BRS Capiaçu silage, using additives or inoculants in the ensiling process.	The experiment was carried out in the experimental area of the college, located in the city of Penápolis/SP, Vicinal Armando Vianna Egreja Road, Urutagua Neighborhood, São Pedro Farm (21° 25'.25" S 50°01'.28" W).	Adding corn bran at a level of 7% in the ensiling process of BRS Capiaçu grass allowed for an increase in dry matter and crude protein levels without, however, affecting the percentage of total digestible nutrients in the silaged material.
Rosa et al. (2019).	Characteristics of Elephant Grass *Pennisetum purpureum* (Schumach) and its new cultivars BRS Kurumi and BRS Capiaçu.	Look for information in the bibliography that can provide agronomic, morphological, and management characteristics for elephant grass and its new cultivars BRS Kurumi and BRS Capiaçu.	Literature Review.	Regarding the cutting and transportation system, BRS Capiaçu is the new high-stature elephant grass cultivar developed, which can be used as pasture or silage, with high biomass potential and low fiber content.
Santos, Faria, Caldas and Duarte (2020).	Variation of the BRS Capiaçu productive potential.	To find out if the grass productivity is satisfactory without using chemical fertilizer, fertilizing only organically, and to know the production capacity of Capiaçu when increasing the organic fertilizer to different levels.	The method is to evaluate the development of the grass with the use of cow manure.	It can be concluded that the productive potential of BRS Capiaçu becomes quite high with the use of organic fertilization.
Aguirre et al. (2024).	Bromatological quality of BRS Capiaçu grass silage with the use of additives under different cutting intervals.	Evaluate the fermentative pattern and the bromatological composition of BRS Capiaçu grass silage ensiled at different growth	The experiment was carried out on a rural property in the Pinheirinho area, in the countryside of São	The use of additives improves the quality and preservation of silages made with elephant grass, cv. Capiaçu, especially the addition of ground corn, which, when combined with a regrowth age of 110 days, improves all the characteristics analyzed

		intervals and with the use of additives (ground corn or inoculants).	Miguel do Oeste, Santa Catarina.	(pH, DM, DM losses, ammoniacal nitrogen, OM, MM, CP, NDF, and ADF).
Rocha et al. (2023).	Residue from grinding corn in the silage of the BRS Capiaçu cultivar.	The use of this residue with the silage technique and awareness regarding the use of leftovers in grain processing.	The experiment was conducted from June 4 to August 30, 2021, on a private family-owned property located in Nova Brasilândia D'Oeste, Rondônia.	The use of leftover corn meal (corn flour) for adding to Capiaçu silage, a hybrid of Pennisetum purpureum Schum. The producer allowed the study to be done without any additional cost regarding the management of the property.
Silva, Cabral and Oliveira (2023).	Capiaçu silage in the diet of dairy cattle.	Discuss the relationship between the use of BRS Capiaçu in dairy cow feed and multiple factors affecting performance and efficiency of production, reproduction, and economy.	Qualitative Review.	Capiaçu emerges as an excellent alternative, increasing productivity by up to 30% in the dry season. The quality of elephant grass silage depends on several factors, including the dry matter content and the use of solid additives to improve fermentation.
Gomes et al. (2024).	BRS Capiaçu: Important information for introducing the forage crop on the farm.	Circular that covers important points in the production of the species, highlighting its potentials and challenges.	Technical Circular.	The elephant grass "BRS Capiaçu," when properly planted and well managed, has high productive potential and great nutritional value, standing out as an excellent option for feeding cattle, especially during the dry season.
Santos et al. (2024).	Centennial analysis of BRS Capiaçu elephant grass silage with different levels of ground corn inclusion.	Evaluate the centesimal composition of elephant grass silage BRS Capiaçu under different levels of inclusion (0, 3, 6, 9, and 12%) of ground corn.	The experiment was carried out in the experimental unit of the State University of Roraima (*Universidade Estadual de Roraima*), Rorainópolis campus.	The addition of increasing levels of ground corn in elephant grass silage cv. BRS Capiaçu, harvested at 132 days, improved the centesimal quality for the evaluated characteristics. Therefore, it is possible to recommend using 6% ground corn inclusion for Capiaçu silage production, as it showed the highest value observed for total digestible nutrients.
Moura et al. (2024).	Management strategies for the BRS Capiaçu cultivar: a literature review.	Describe the main characteristics of the BRS Capiaçu cultivar, such as botanical traits, soil and climate conditions for its cultivation, emphasizing its	Qualitative Research.	The use of additives improves results in silage production. Due to its high productivity and tolerance to water stress, the BRS Capiaçu cultivar emerges as a new option for dealing with drought in the semi-arid region of Minas Gerais,

		biomass production and nutritional value, as well as silage production.		allowing for the maintenance of animal production during periods of forage shortage in pastures.
Ramos et al. (2024).	Performance of the BRS Capiaçu cultivar under different cutting ages.	Evaluate the productive performance of the BRS Capiaçu cultivar at different cutting ages to identify the best time for farmers to use this forage.	The experiment was carried out in the cattle farming department at IFNMG Almenara Campus.	The development of BRS Capiaçu grass strips proved to be a viable strategy for producers to preserve forage for animal feed during the dry season, showing a high biomass production.
Chagas et al. (2024).	Behavior of BRS Capiaçu grass subjected to different types of fertilization.	Identify which type of fertilization (organic, chemical, or a combination of both) results in higher productivity and quality of the grass. For this, an experiment was conducted with different sources of organic fertilizers and combinations of them.	The experiment was conducted at Sítio Rancho Canduba, located in Alto Paraíso de Goiás - GO from August to November 2023, totaling 102 days until the evaluation.	The study helped us understand how different fertilization methods affect the growth and quality of BRS Capiaçu grass, providing valuable information for farmers to improve their pasture management practices.
Gandra et al. (2021).	BRS Capiaçu experience on small dairy farms in the Carajás - Pará region.	Develop dairy farming on small farms in southeastern Pará using the BRS Capiaçu cultivar as the main factor for producing silage on a small scale on these farms.	The initiative for this extension action came from a demand within the actions of PEPETI (Center for Teaching, Research, Extension, Technology, and Innovation) at UNIFESSPA, aimed at boosting public policies that can include small producers from Canaã dos Carajás in the dairy production context.	The first experience with the BRS Capiaçu cultivar on small farms in southeastern Pará was valid and significant, but there is a real priority in spreading silage farming in the Carajás region.
Leal et al. (2020).	Correlations between the productive and nutritional characteristics of BRS	Evaluate the correlations between the productive and nutritional characteristics of BRS Capiaçu grass	The trial was conducted at the UNIMONTES Experimental Farm, in	In the semi-arid region of Northern Minas, it is recommended to manage the cutting of BRS Capiaçu grass at a height of

	Capiaçu grass managed in the semi-arid region.	(*Pennisetum purpureum* Schum) managed at different heights in the semi-arid region of Northern Minas.	the municipality of Janaúba - MG.	1.93 meters for daily forage harvesting and from 3.43 to 4.50 meters for silage.
Espindóla, Silva and Meira (2022).	Feasibility of growing BRS Capiaçu (*Pennisetum purpureum* Schum). According to its water requirements in the municipality of Canhotinho - PE.	Assess the feasibility and possibility of implementing this crop in the city of Canhotinho-PE according to the climatology recorded over 58 years, analyzing the most suitable months for cultivation and those with the highest rainfall.	The development of this research took place through the collection of data related to the cultivation of BRS Capiaçu, taking into account the plant's morphology, characteristics, and potential that set it apart from others, as well as its needs and requirements, especially regarding rainfall.	It was possible to observe that there is a cultivation window in the municipality of Canhotinho that goes from May to July, classified as the rainiest months. The production of this forage species in the city can also contribute to the development of the local herd, as well as the economy and trade.
Azevedo et al. (2020).	Silage characteristics of elephant grass (BRS Capiaçu Schum.) with levels of moringa inclusion (*Moringa oleífera* Lam.).	Evaluate elephant grass silage (*Pennisetum purpureum Schum*.) with levels of moringa inclusion (*Moringa oleífera* Lam.) about the sensory characteristics, the fermentation pattern, and the chemical-bromatological composition.	The experiment was carried out at the Food Science and Wood Technology Laboratories (*Laboratórios de Bromatológica e Tecnologia da Madeira* - LTM) of the Federal University of Western Pará (*Universidade Federal do Oeste do Pará* - UFOPA), Tapajós campus, Santarém, Pará.	Elephant grass silages with and without the addition of moringa showed sensory and fermentation characteristics of good-quality silages. On the other hand, adding moringa to elephant grass silage produces silages with lower NDF and ADF levels, and higher CP content compared to silage made solely from elephant grass.

Source: Research Data (2025).

Table 1 shows the publications selected to make up this integrative review, covering studies that address different aspects related to BRS Capiaçu grass, such as bromatological composition, silage production, use of additives, cutting age, fertilization, productivity, nutritional value, cultivation feasibility, and application on small farms. This diversity of approaches allows for a broad understanding of Capiaçu, considering not only its productive potential but also the management factors that directly affect forage quality and its use in animal feeding.

The analysis of the publications shows that most of the studies focus on the production and quality of BRS Capiaçu silage, especially regarding the use of additives like cornmeal, ground corn, corn bran, inoculants, and other materials that can improve dry matter content, reduce fermentation losses, and help preserve the ensiled material. These results show that, although BRS Capiaçu grass has high biomass production potential, its efficiency as a bulk feed directly depends on proper cutting, processing, compacting, storage, and supplementation practices.

It is also noted that the productive and nutritional performance of the cultivar is linked to factors like cutting age, fertilization, soil fertility, water availability, and the intended use of the forage, whether for fresh supply or for silage production. So, the studies reviewed highlight that Capiaçu can be a strategic option for family farms, especially because it helps provide forage during the dry season, reduces dependence on external feed, and improves the food security of livestock.

Carrying out an integrative review is important in this context because it allows you to bring together different types of evidence on the same topic, organizing information that is scattered across scientific and technical literature. This type of review makes it possible to identify the main results already obtained, compare findings between studies, recognize knowledge gaps, and point out directions for new research and management practices. Also, by integrating experimental studies, reviews, and technical publications, the integrative review supports an analysis that is closer to the reality of producers, especially those involved in family farming systems.

In this way, the results shown in Table 1 served as the basis for building the thematic categories discussed below. These categories help analyze BRS Capiaçu grass from different angles, including its agronomic and physiological characteristics, use as forage, silage production, nutritional value, economic aspects, social and environmental sustainability, as well as the main challenges and limitations related to its cultivation and management.

Discussion

Agroeconomic performance and responses of BRS Capiaçu to management

The results of Santos, Faria, Caldas, and Duarte (2020) and Retore et al. (2021) point in the same direction, showing that the high biomass production potential of BRS Capiaçu

doesn't rely only on the cultivar's characteristics, but also on the management practices used. Although both studies show positive production outcomes, they looked at different factors, so we need to be careful when comparing and generalizing their results.

Santos, Faria, Caldas, and Duarte (2020) observed that using organic fertilization helped the growth and productive potential of BRS Capiaçu. This result shows that it's possible to use organic nutrient sources in forage crop cultivation, especially when these materials are available on the farm. However, since the study focused on the plant's productive response, we can't directly say that this strategy lowers production costs or increases the economic viability of small farms without evaluating specific economic indicators.

Retore et al. (2021), in turn, showed that the cutting age and nitrogen fertilization influenced biomass production, with higher yields in plants harvested at 120 days and fertilized with 100 or 200 kg of N/ha/year. These results confirm that extending the growth period and increasing nitrogen supply can promote forage accumulation. However, higher biomass production should not be considered on its own, since the plant's age can also change its composition and nutritional value, making it necessary to balance productivity and quality according to the intended use of the forage.

The studies by Santos, Faria, Caldas, and Duarte (2020) and Retore et al. (2021) should, therefore, be seen as complementary evidence. The first shows the cultivar's response to organic fertilization, while the second highlights the effects of nitrogen fertilization and cutting age. Since there was no direct comparison between these strategies, the results don't allow us to say one fertilization source is better than the other, but they do suggest that BRS Capiaçu's productive performance comes from the interaction between nutrient availability, harvest timing, and growing conditions.

Thus, the potential of BRS Capiaçu depends on adopting management practices that fit the characteristics of the property and the intended use of the forage. High biomass production is an agronomic advantage, but achieving it may require fertilization and cutting planning, which are factors that need to be considered, especially on farms with financial, technological, or technical assistance limitations.

Potential use of BRS Capiaçu as forage in feed planning

Gomes et al. (2024) and Retore et al. (2021) indicate that high biomass production is one of the main characteristics that make BRS Capiaçu suitable for feeding cattle. Retore et al. (2021) highlight its suitability for providing chopped green forage in the trough and for silage production, while Gomes et al. (2024) point out its potential as a roughage source, especially during periods of lower pasture availability. However, this evidence is mostly agronomic and technical and does not, by itself, allow conclusions about the effects of the cultivar on intake, digestibility, or animal performance.

High productivity can help with the farm's food planning by increasing the amount of forage produced in a relatively small area. However, biomass production alone doesn't

guarantee a continuous supply of food during the dry season. This depends on cutting schedules, water availability, soil fertility management, and especially on preserving the surplus produced in favorable periods. So, the potential pointed out by Gomes et al. (2024) and Retore et al. (2021) depends on the farm's ability to turn the cultivar's productivity into actual available feed.

In the context of family farm properties, Gandra et al. (2021) reported an experience using BRS Capiaçu for small-scale silage production in the Carajás region, suggesting that the cultivar could expand feeding options for herds. However, the authors also emphasized the need to spread knowledge about forage production and preservation. This result shows that the applicability of the cultivar doesn't depend solely on its productive capacity, but also on access to technical assistance, availability of labor, and the necessary infrastructure for cutting, processing, and storing the forage.

Although producing your own forage can reduce dependence on buying feed, the studies in this category didn't provide enough economic comparisons to confirm how much this reduction really is. Likewise, there wasn't direct evidence to determine the level of supplementation needed for different types of animals. So, BRS Capiaçu should be seen as a source of forage that needs to be integrated into the herd's nutritional planning, taking into account the forage quality, the type of animal, and the other ingredients in the diet.

Silage of BRS Capiaçu: Fermentative challenges and the use of additives

The high biomass production makes BRS Capiaçu ideal for building up forage reserves. However, this productive advantage alone doesn't guarantee good-quality silage. Dry matter content at harvest, plant age, processing, and compaction all interact to affect the fermentation environment, so it's important to balance the amount of forage produced with proper storage conditions.

Rosa et al. (2019) and Silva, Cabral, and Oliveira (2023) highlight the suitability of BRS Capiaçu for silage production and the importance of dry matter content, particle size, and compaction. These practices facilitate air removal from the ensiled mass and the establishment of anaerobic fermentation. However, although these authors present silage as an alternative for cattle feeding, the synthesized evidence does not support the conclusion that it is economically superior to other roughage sources, as comparative indicators of costs, labor requirements, and storage infrastructure were not provided.

Experimental studies consistently report benefits from the inclusion of dry, energy-rich ingredients, although they differ regarding recommended inclusion levels and the variables affected. Paula et al. (2020) observed that cornmeal reduced fermentation losses, including gas and effluent losses, suggesting an inclusion level above 10%. In contrast, Proença et al. (2022) found that the inclusion of 7% corn bran increased dry matter and crude protein contents without affecting the concentration of total digestible nutrients.

Santos et al. (2024), in turn, observed improvements in silage composition with increasing levels of ground corn and recommended a 6% inclusion level, as it resulted in the highest total digestible nutrient content. Aguirre et al. (2024) also identified favorable responses to ground corn, particularly when combined with ensiling BRS Capiaçu at 110 days of regrowth. These findings demonstrate that the response to additives depends not only on the inclusion level but also on cutting age, the initial composition of the grass, and the indicators used to assess silage quality.

This heterogeneity prevents the establishment of a single inclusion level of corn or cornmeal as a general recommendation. Retore et al. (2020), for example, found that ensiling BRS Capiaçu at 60 days required the inclusion of at least 15% crushed corn to increase dry matter content. In contrast, Santos et al. (2024) recommended 6%, while Proença et al. (2022) reported favorable results with 7%. These differences should be interpreted in light of the specific conditions of each experiment rather than as conflicting recommendations.

It is also necessary to distinguish improvements in fermentation from direct changes in chemical composition. The increase in dry matter content following the addition of cornmeal, corn bran, or ground corn results, in part, from incorporating a drier ingredient into the ensiled mass. Similarly, changes in crude protein or total digestible nutrient contents may reflect the composition of the additive rather than necessarily indicating greater fermentation efficiency. Therefore, the findings of Proença et al. (2022), Paula et al. (2020), Aguirre et al. (2024), and Santos et al. (2024) should be interpreted alongside indicators such as pH, dry matter losses, effluent production, and ammonia nitrogen.

Azevedo et al. (2020) observed that the inclusion of moringa increased crude protein content and reduced the fibrous fractions of silage. However, these changes may result from both the preservation process and the incorporation of a material with a composition different from that of the original forage. Furthermore, it is necessary to confirm whether the study specifically evaluated the BRS Capiaçu cultivar, as this information is reported inconsistently between the discussion section and the characterization table. Until this is confirmed, its findings should be regarded as supplementary evidence regarding the use of plant-based additives in elephant grass silage.

In the context of family farms, using locally available materials may reduce the need to purchase commercial additives. Rocha et al. (2023), when evaluating the use of corn milling residue on a family farm, demonstrated the potential to utilize a by-product already available within the production system. However, a single case report is insufficient to conclude that this strategy is economically advantageous across different farms, particularly when transportation, residue availability, labor requirements, and the quantities needed are taken into account.

In summary, the studies demonstrate that BRS Capiaçu is suitable for silage production, but its high productivity must be accompanied by management practices

appropriate to the plant's moisture content and maturity. Dry additives and carbohydrate sources can increase dry matter content, reduce losses, and modify nutritional composition; however, their selection and inclusion levels should be determined according to the characteristics of the material being ensiled. Thus, the available evidence supports the technical feasibility of silage production but remains insufficient to establish a universal recommendation regarding additives or to confirm their economic viability on family farms.

Nutritional value of BRS Capiaçu and implications for cattle feeding

The nutritional value of BRS Capiaçu is influenced by the plant's developmental stage and the intended use of the forage. Although extending the growth period promotes biomass accumulation, this increase in productivity may be accompanied by changes in plant composition, particularly an increased proportion of stems and fibrous tissues. Therefore, determining the appropriate cutting time should take into account not only the amount of forage produced but also the quality required for the animal category and the method of feeding.

Leal et al. (2020), when evaluating BRS Capiaçu in the semi-arid region of northern Minas Gerais, observed a negative correlation between certain productive and nutritional characteristics. This finding highlights a trade-off between biomass production and nutritional value: more developed plants may yield greater dry matter production but exhibit a composition that is less favorable for utilization by animals. However, this relationship should not be interpreted as a fixed response of the cultivar, as its magnitude may vary depending on soil and climatic conditions, fertilization, and management practices.

The relative decline in quality in more mature plants is consistent with an increased proportion of stems and fibrous material, accompanied by a reduced proportion of leaves. From a nutritional perspective, these changes may decrease the concentration of more digestible forage components. However, plant composition data alone do not establish that cattle feed intake, digestibility, or performance has declined, since these outcomes depend on the complete diet and must be directly assessed in animal feeding trials.

Leal et al. (2020) recommended different cutting heights according to the intended use. For daily feeding as chopped grass provided in feeding troughs, the authors recommended approximately 1.93 m, a height associated with a better balance between yield and quality. For silage production, cutting heights between 3.43 and 4.50 m were recommended, as they allow greater biomass accumulation. However, adopting later cutting stages for silage production requires careful consideration of the composition of the harvested material, since the quantitative advantage may be accompanied by an increased fiber fraction and greater difficulties in preservation.

Ramos et al. (2024) also associated cutting time with the intended use of the cultivar and recommended an interval of 70 to 100 days for feeding fresh forage, chopped and provided in feeding troughs. This recommendation is consistent with Leal et al. (2020) regarding the need for relatively earlier cutting when the objective is to prioritize forage quality. However, cutting height and cutting age should not be considered directly equivalent criteria, as plant growth rates may vary across regions, seasons, and management conditions.

Thus, the values reported by Leal et al. (2020) and Ramos et al. (2024) should be understood as references obtained under specific conditions rather than universal thresholds. More important than relying exclusively on a fixed cutting height or age is monitoring plant development, the leaf-to-stem ratio, and the intended use of the forage. For immediate feeding, management tends to prioritize better nutritional composition; for establishing forage reserves, greater biomass accumulation may be acceptable, provided that the limitations associated with plant maturity are taken into account.

From the perspective of cattle nutrition, BRS Capiaçu should primarily be regarded as a roughage source. Its nutritional contribution will depend on forage composition at the time of cutting and how it is incorporated into the other components of the diet. Although more mature forage may contain higher fiber concentrations and a lower proportion of digestible components, the studies reviewed do not allow direct determination of the energy or protein supplementation levels required for different animal categories.

Silva, Cabral, and Oliveira (2023) emphasize that BRS Capiaçu may represent an economical alternative for dairy cattle when used as chopped grass or silage. However, the authors themselves point out that such an assessment must include the costs of concentrates, supplements, labor, establishment, harvesting, and storage. Therefore, high productivity per unit area should not be equated with lower dietary costs, as economic viability depends on farm infrastructure and the need to supplement the nutritional value of the roughage.

In the context of family farms, Gandra et al. (2021) observed that the introduction of BRS Capiaçu expanded the available feeding alternatives for dairy herds in the Carajás region. This finding supports the applicability of the cultivar in small-scale production systems but does not, in itself, demonstrate nutritional superiority or reduced feed costs. The authors also emphasized the need to disseminate knowledge about forage production and conservation, demonstrating that the effective use of this cultivar depends on access to technical guidance.

Management and conservation practices may help preserve or modify forage composition, but their effects must be interpreted according to the intended use. The choice of cutting age directly influences the relationship between yield and quality, while processing and conservation determine how much of that quality is retained until the forage is fed to the animals. In the case of silage, the effects of additives and dry matter content were discussed separately to avoid attributing to cutting management outcomes that also depend on the fermentation process.

In summary, Leal et al. (2020), Ramos et al. (2024), Silva, Cabral, and Oliveira (2023), and Gandra et al. (2021) indicate that the feeding potential of BRS Capiaçu results from the interaction between productivity, cutting time, conservation method, and the organization of the production system. The available evidence supports its use as a roughage source but remains limited in establishing direct effects on feed intake, digestibility, milk production, or animal performance. This knowledge gap reinforces the need for studies that integrate agronomic characteristics, nutritional composition, animal responses, and economic assessments on family farms.

Adoption of BRS Capiaçu in family farms: Potential and socioeconomic gaps

Gomes et al. (2024) emphasize that BRS Capiaçu, when properly established and managed, exhibits high productive potential and good nutritional value, potentially contributing to the supply of roughage in cattle production systems, particularly during the dry season. This characteristic suggests the potential to improve feed security for livestock herds but does not, in itself, support the conclusion that adopting the cultivar increases income, reduces production costs, or strengthens the autonomy of rural families, since these outcomes were not directly evaluated by the authors.

The evidence most directly related to family farms was presented by Gandra et al. (2021), who reported their experience with establishing BRS Capiaçu for small-scale silage production on dairy farms in the Carajás region of Pará, Brazil. The authors considered the experience valuable and significant, demonstrating that the cultivar can be incorporated into family-based production systems. However, they also identified the need to expand the dissemination of knowledge about ensiling, indicating that the adoption of this technology depends not only on forage availability but also on training, technical support, and access to appropriate conservation practices.

Rocha et al. (2023) also bring the discussion closer to the realities of family farms by evaluating the use of corn milling residue in BRS Capiaçu silage production on a farm of this type. The study demonstrates the possibility of incorporating a resource already available on the farm into the forage conservation process. However, because this was a localized experience, its findings are insufficient to establish that using this residue reduces costs or is economically viable across different production systems, as factors such as material availability, required quantities, transportation, and labor may vary among farms.

Taken together, Gomes et al. (2024), Gandra et al. (2021), and Rocha et al. (2023) indicate that the contribution of BRS Capiaçu to family farms depends on the interaction between productive potential, availability of local resources, proficiency in management techniques, and access to technical assistance. The cultivar may expand the options available for roughage production and conservation, but its adoption should not automatically be interpreted as a socioeconomic improvement. Plant productivity translates into benefits for

rural families only when farms have adequate conditions for forage establishment, harvesting, processing, storage, and proper utilization.

Therefore, claims regarding reduced dependence on purchased feed, production stability, and herd maintenance should be understood as potential benefits. The included studies did not provide systematic comparisons between farms that adopted BRS Capiaçu and those that did not, nor did they measure feed costs, family income, return on investment, or changes in herd productivity over time. The absence of these indicators limits the ability to conclude that the cultivar promotes economic or social sustainability.

Similarly, no studies were identified that directly assessed cultural aspects, such as farmers' perceptions, the integration of the cultivar into traditional knowledge, acceptance of ensiling techniques, or changes in family farming practices. Although it is plausible that BRS Capiaçu cultivation may be integrated into existing practices, such as forage plot management, harvesting, transportation, and forage conservation, this interpretation still requires specific investigation.

Thus, the main social contribution supported by the studies relates to the feasibility of using the cultivar on small farms and the importance of rural extension services in facilitating its adoption. Conversely, its effects on income, autonomy, family organization, and cultural practices remain important knowledge gaps. Future studies should integrate agronomic assessments with economic and social indicators, including establishment and management costs, financial returns, farmers' perceptions, labor requirements, access to technical assistance, and adaptation of the technology to local conditions.

Agronomic, operational, and adoption limitations of BRS Capiaçu

The limitations associated with BRS Capiaçu do not arise from a single characteristic of the cultivar but rather from the interaction between environmental conditions, management practices, and the operational capacity of the farm. The included studies indicate that fertilization, water availability, cutting age, and forage conservation directly influence the quantity and quality of the material produced. Thus, the cultivar's high biomass accumulation capacity should be interpreted as a potential that depends on appropriate management rather than as a guaranteed outcome across different production systems.

Regarding agronomic aspects, Santos, Faria, Caldas, and Duarte (2020) and Chagas et al. (2024) demonstrated that the growth and development of BRS Capiaçu respond to fertilization practices. These findings confirm the importance of adequate nutrient supply but also reveal that the cultivar's productivity may depend on agricultural inputs and soil fertility management. Since the studies were conducted under specific conditions, their findings do not support the establishment of a single fertilization strategy applicable to different soils and regions.

Water availability is another important factor. Espindóla, Silva, and Meira (2022), when assessing the climatic suitability of the cultivar in Canhotinho, Pernambuco, Brazil,

identified the period from May to July as the most favorable planting window due to higher rainfall levels. This finding highlights the need to align planting schedules with regional rainfall patterns. However, because this was a location-specific analysis, the recommendation should not be generalized to other semi-arid areas, where rainfall patterns may differ.

Therefore, moderate tolerance to water deficit does not imply independence from water availability. Prolonged drought periods may reduce plant growth and delay harvesting, while excessive rainfall may hinder harvesting and conservation operations. Accordingly, planning for crop establishment and harvesting should consider not only annual precipitation but also its distribution throughout the production cycle.

Regarding operational aspects, Retore et al. (2020) demonstrated that silage quality depends on the interaction between cutting age and dry matter content. The authors found that forage harvested at 60 days exhibited a more favorable nutritional composition but required the inclusion of at least 15% crushed corn to increase its dry matter content. This finding shows that earlier harvesting may improve nutritional composition while creating greater conservation challenges due to the high moisture content of the material.

The need to adjust dry matter content represents a practical limitation, as it may require purchasing, obtaining, or producing additives. Furthermore, successful ensiling depends on appropriate processing, compaction, sealing, and storage. However, Retore et al. (2020) did not directly assess mistakes made by farmers or the effects of technical assistance. Rather, the study demonstrates the sensitivity of the ensiling process to management decisions, not the frequency of such problems on farms.

The adoption-related dimension was addressed more directly by Gandra et al. (2021), who reported the introduction of BRS Capiaçu and silage production on small dairy farms in the Carajás region. Although the experience was considered valuable, the authors emphasized the need to expand the dissemination of ensiling techniques. This finding indicates that the availability of the cultivar alone does not ensure its efficient utilization, as adoption also depends on training and ongoing technical support.

Establishing and managing the cultivar may also involve soil preparation and amendment, acquisition or propagation of planting material, fertilization, labor, and equipment for harvesting and processing. When intended for silage production, additional requirements include transportation, compaction, sealing, and storage. These factors may hinder adoption on farms with limited resources, although the body of literature analyzed does not provide sufficient economic assessments to quantify the relative burden of each investment.

Therefore, the studies indicate that the main limitations of BRS Capiaçu are not restricted to the plant itself but also involve the ability to adapt the production system to its management and conservation requirements. Soil fertility, rainfall distribution, cutting time, dry matter content, and proficiency in ensiling techniques determine how effectively the

biomass produced can be utilized. Nevertheless, knowledge gaps remain regarding establishment costs, labor requirements, equipment availability, and the barriers faced by family farmers in adopting the cultivar.

Final Considerations

The main contribution of this review was to bring together scattered scientific and technical evidence about BRS Capiaçu and show that its potential as a forage resource doesn't rely solely on high biomass production. Using this cultivar results from the interaction between growing conditions, fertilization, cutting time, intended use, and the forage's capacity for conservation. The summary also highlighted that increasing dry matter production can come with a relative drop in nutritional value, making it necessary to balance quantity and quality according to the production system.

The available studies support the use of BRS Capiaçu as a forage source, both in the form of chopped grass and silage. However, the evidence mainly focuses on agronomic traits, chemical composition, and the use of additives in silage. So, even though this variety has potential for use on family farms, the results still don't allow us to say broadly that adopting it promotes economic, social, cultural, and environmental sustainability, since these areas haven't been directly studied much.

The main gaps identified involve the lack of trials linking cultivar management to consumption, digestibility, productive performance, and milk production of animals. Comparative evaluations of costs related to establishment, harvesting, processing, ensiling, and supplementation are also needed, as well as studies on labor demand, economic return, access to technical assistance, and barriers to adoption on family farms. The environmental impacts of forage cultivation and conservation are still little studied, as are producers' perceptions and the social and cultural implications of its incorporation into production systems. Conducting field studies in different regions and management conditions will make it possible to determine more precisely in which contexts BRS Capiaçu represents a technically, economically, and environmentally sustainable alternative.

Publication ethics statement

This article was a review of other articles, and no procedures involving humans or animals were used, nor any resources requiring ethics board approval or similar.

Conflict of interest statement

The authors state that they have no financial, commercial, personal, or academic interests that could have influenced the results or interpretation of this manuscript.

Declaration of Artificial Intelligence use

Generative Artificial Intelligence tools were used exclusively for language editing tasks, reference standardization, and improving textual clarity. The tools were not used to generate ideas, hypotheses, interpretations, analyses, results, or scientific conclusions. The authors confirm that the manuscript does not contain content fabricated, manipulated, or fully produced by AI, and that all information was manually verified. The authors take full ethical and scientific responsibility for the final content.

REFERENCES

Aguirre, P. F., Demarco, I. R., Binsfeld, L. A., & Guzatti, G. C. (2024). **Qualidade bromatológica da silagem do capim BRS Capiaçu com o uso de aditivos sob diferentes intervalos de corte [Bromatological quality of BRS Capiaçu grass silage using additives under different cutting intervals].** *Revista Foco, 17*(12), e7240. https://doi.org/10.54751/revistafoco.v17n12-109

Azevedo, M. M. R., Guimarães, A. K. V., Cabral, Í. S., Barbosa, C. R., Machado, L. S., Pantoja, J. C., Amaral, T. E. S., & Aguiar, A. S. (2020). **Características de silagens de capim-elefante (Pennisetum purpureum Schum.) com níveis de inclusão de moringa (Moringa oleifera Lam.) [Characteristics of elephant grass silages (Pennisetum purpureum Schum.) with inclusion levels of moringa (Moringa oleifera Lam.)].** *Brazilian Journal of Development, 6*(9), 71418–71433. https://doi.org/10.34117/bjdv6n9-549

Chagas, N. S., Oliveira Neto, M. X., Freitas, L. M., & Souza, Y. S. B. (2024). **Comportamento do capim BRS Capiaçu submetido a diferentes tipos de adubações [Behavior of BRS Capiaçu grass under different fertilization types].** *Repositório Institucional, 2*(2). https://revistas.icesp.br/index.php/Real/article/view/4907/2617

Espindóla, N. L., Silva, R. A., & Meira, W. (2022). **Viabilidade de cultivo de BRS Capiaçu (Pennisetum purpureum Schum.) de acordo com suas exigências hídricas no município de Canhotinho-PE [Feasibility of cultivating BRS Capiaçu according to its water requirements in Canhotinho-PE].** *Encontro de Agroecologia do Agreste de Pernambuco*.

Gandra, J. R., Silva, L. S., Silva, D. S., Gandra, E. R. S., Gomes, E. P., Rodrigues, L. S., Dourado, D. C., Costa, K. C. P., Rodrigues, D. M., Carvalho, J. S., & Oliveira, E. R. (2021). **BRS Capiaçu: experiência em pequenas propriedades leiteiras da região de Carajás-Pará [BRS Capiaçu: experience in small dairy farms in the Carajás-Pará region].** *RealizAção, 8*(16), 64–81. https://doi.org/10.30612/realizacao.v8i16.15264

Ganong, L. H. (1987). *Integrative reviews of nursing research. Research in Nursing & Health, 10*(1), 1–11. https://doi.org/10.1002/nur.4770100103

Gomes, F. K., Silva, K. T., Lima, N. M. F., & Melo, L. G. P. (2024). **BRS Capiaçu: informações importantes para implantação da forrageira na propriedade [BRS Capiaçu:**

important information for implementing the forage crop on the farm]. EPAMIG. https://www.livrariaepamig.com.br/wp-content/uploads/2024/11/CT-414.pdf

Leal, D. B., Monção, F. P., Junior, V. R. R., Carvalho, C. D. C. S., Alencar, A. M. S., de Almeida Moura, M. M., & Rigueira, J. P. S. (2020). **Correlações entre as características produtivas e nutricionais do capim-BRS Capiaçu manejado na região semiárida [Correlations between productive and nutritional characteristics of BRS Capiaçu grass managed in the semiarid region].** *Brazilian Journal of Development*. https://repositorio.ufmg.br/handle/1843/43749

Mattos, P. C. (2015). **Tipos de revisão de literatura [Types of literature review].** https://www.fca.unesp.br/Home/Biblioteca/tipos-de-evisao-de-literatura.pdf

Mendes, K. D. S., Silveira, R. C. C. P., & Galvão, C. M. (2008). **Revisão integrativa: método de pesquisa para a incorporação de evidências na saúde e na enfermagem [Integrative review: research method for incorporating evidence in health and nursing].** *Texto & Contexto – Enfermagem, 17*(4), 758–764. https://doi.org/10.1590/S0104-07072008000400018

Moura, M. M. A., Alves, W. S., Rigueira, J. P. S., Mizobutsi, E. H., Monção, F. P., Fernandes, M. B., Almeida, L. B., & Araujo, I. V. S. (2024). **Estratégias de manejo para a cultivar BRS Capiaçu: uma revisão de literatura [Management strategies for the BRS Capiaçu cultivar: a literature review].** *Brazilian Journal of Animal and Environmental Research, 7*(2), e69353. https://doi.org/10.34188/bjaerv7n2-052

Paula, P. R. P., Neiva Júnior, A. P., Souza, W. L., Abreu, M. J. I., Teixeira, R. M. A., Cappelle, E. R., & Tavares, V. B. (2020). **Composição bromatológica da silagem de capim-elefante BRS Capiaçu com inclusão de fubá de milho [Bromatological composition of BRS Capiaçu elephant grass silage with corn meal inclusion].** *PUBVET, 14*(10), 1–11. https://doi.org/10.31533/pubvet.v14n10a682.1-11

Pereira, A. V. (2016). **BRS Capiaçu: cultivar de capim-elefante de alto rendimento para produção de silagem [BRS Capiaçu: high-yield elephant grass cultivar for silage production].** Embrapa Gado de Leite. https://www.infoteca.cnptia.embrapa.br/infoteca/bitstream/doc/1056288/1/ComunicadoTecnico79.pdf

Pereira, A. V., Auad, A. M., Santos, A. M. B., Mittelmann, A., Gomide, C. A. M., Martins, C. E., Lédo, F. J. S., Machado, J. C., Ferreira, R. P., Rocha, W. S. D., & Oliveira, J. S. (2021). *BRS Capiaçu e BRS Kurumi: cultivo e uso*. Embrapa. https://www.embrapa.br/busca-de-publicacoes/-/publicacao/1131853/brs-capiacu-e-brs-kurumi-cultivo-e-uso

Proença, B. C. (2022). **Valor nutricional da silagem de capim-elefante (Pennisetum purpureum Schum.) cv. BRS Capiaçu com diferentes aditivos e inoculantes [Nutritional value of elephant grass silage cv. BRS Capiaçu with different additives and inoculants].** *Ars Veterinaria, 38*(3), 79–83. https://doi.org/10.15361/2175-0106.2022v38n3p79-83

Ramos, K. T., Figueiredo, S. M., & Gomes, G. O. (2024). **Desempenho da cultivar BRS-Capiaçu sob diferentes idades de corte [Performance of the BRS-Capiaçu cultivar under**

different cutting ages]. *Anais do IFintegra 2023*. https://eventos.ifnmg.edu.br/if_integra_2023/anais/

Retore, M. (2020). **Qualidade da silagem do capim-elefante BRS Capiaçu [Quality of BRS Capiaçu elephant grass silage].** Embrapa Agropecuária Oeste. https://www.infoteca.cnptia.embrapa.br/infoteca/bitstream/doc/1130009/1/COT-261-2020.pdf

Retore, M. (2021). **Manejo do capim BRS Capiaçu para aliar produtividade à qualidade [Management of BRS Capiaçu grass to combine productivity and quality].** Embrapa Agropecuária Oeste. https://www.infoteca.cnptia.embrapa.br/infoteca/bitstream/doc/1134720/1/COT-263-2021.pdf

Rocha, V. C., Marinho, D. S., Schneider da Silva, K. V., Vendrusculo, J., França Neto, A. C., & Ferreira, E. (2023). **Resíduo da moagem de milho na ensilagem da cultivar BRS Capiaçu [Corn milling residue in the ensiling of the BRS Capiaçu cultivar].** *Revista Brasileira de Meio Ambiente & Sustentabilidade, 3*(3), 108–121. https://rbmaes.emnuvens.com.br/revista/article/view/327

Rosa, P. P., Da Silva, P. M., Chesini, R. G., De Oliveira, A. P. T., Sedrez, P. A., Faria, M. R., Lopes, A. A., Roll, V. F. B., & Ferreira, O. G. L. (2019). **Características do capim-elefante Pennisetum purpureum (Schumach) e suas novas cultivares BRS Kurumi e BRS Capiaçu [Characteristics of elephant grass Pennisetum purpureum and its new cultivars BRS Kurumi and BRS Capiaçu].** *Pesquisa Agropecuária Gaúcha, 25*(1/2), 70–84. https://doi.org/10.36812/pag.2019251/270-84

Santos, A. A. N., Faria, G. U., Caldas, L. S., & Duarte, A. R. (2020). **Variação do potencial produtivo BRS Capiaçu [Variation in productive potential of BRS Capiaçu].** *Anais do 3º Simpósio de TCC das Faculdades FINOM e Tecsoma,* 72–80. https://www.finom.edu.br/assets/uploads/cursos/tcc/202102031402543.pdf

Santos, S., Frisso, R. M., Castro, T. M. M. G., Silva, L. S., Silva, V. S., Sousa, R. T., Oliveira, A. C., & Santos, M. (2024). **Análise centesimal da silagem do capim-elefante BRS Capiaçu com diferentes níveis de inclusão de milho moído [Proximate analysis of BRS Capiaçu elephant grass silage with different levels of ground corn inclusion].** *Observatório de la Economía Latinoamericana, 22*(5), e4416. https://doi.org/10.55905/oelv22n5-166

Silva, D. H., Cabral, S. P., & de Oliveira, H. J. B. (2023). *Silagem de Capiaçu na alimentação de bovinos leiteiros / Capiaçu silage in dairy cattle feeding*. *Revista Multidisciplinar do Nordeste Mineiro, 12*. https://pdfs.semanticscholar.org/2bf8/bd805b5630e7d477a2c8ebb84078ab506c6c.pdf

Whittemore, R., & Knafl, K. (2005). *The integrative review: Updated methodology*. *Journal of Advanced Nursing, 52*(5), 546–553. https://doi.org/10.1111/j.1365-2648.2005.03621.x

Data availability

The data underlying the research are reported in the article.

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