http://journal.unoeste.br/index.php/ca/index
DOI: 10.5747/ca.2021.v17.n5.a459
ISSN on-line 1809-8215

Colloquium Agrariae

Submetido: 26/07/2021 Revisado: 28/09/2021 Aceito: 01/10/2021

Quality of forage seeds sold in the state of Mato Grosso

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Abstract
The acquisition of high-quality seeds is essential to successfully implant areas with forage. However, to be commercialized, they must meet the minimum quality standards established by law. Inspections are necessary to guarantee the quality and identity of the commercialized seed. Thus, the objective was to evaluate the quality of tropical forage seed species collected in 2018, in the state of Mato Grosso. The survey was based on data from officers' samples, in commercial establishments and fine consumers, collected during inspections conducted by the Agricultural Defense Institute of the State of Mato Grosso - INDEA-MT and subsequently analyzed by the Guilherme de Abreu Lima Seed Analysis Laboratory (LASGAL). Purity analysis, determination of other seeds by number (DOSN), germination test and tetrazolium test were carried out. The study showed that 75% of the analyzed samples reached the minimum requirements for commercialization in terms of physical purity; 95% of the samples were within the standard for physiological quality determined by law; and 91.9% did not exceed the maximum limits regarding the number of undesirable seeds present in a sample. In general, 36.1% of the total samples analyzed did not conform in some way to quality standards, therefore were not appropriate for commercialization.
Keywords: inspection; trade; *Urochloa, Panicum.*

Qualidade de sementes forrageiras comercializadas no estado de Mato Grosso

Resumo
A aquisição de sementes de alta qualidade é primordial para o sucesso da implantação de áreas com forrageiras. Contudo, para serem comercializadas, estas devem atender aos padrões mínimos de qualidade previsto em Lei. Sendo a fiscalização necessária para garantir a qualidade e identidade das sementes comercializadas. Assim, objetivou-se avaliar a qualidade das sementes de espécies forrageiras tropicais coletadas no ano de 2018, no estado de Mato Grosso. O levantamento foi baseado em dados oriundos de amostras oficiais, coletadas em estabelecimentos comerciais e consumidores finais, pela fiscalização do Instituto de Defesa Agropecuária do estado de Mato Grosso – INDEA-MT e posteriormente analisadas pelo Laboratório de Análise de Sementes Guilherme de Abreu Lima (LASGAL). Foram realizadas análises de pureza, determinação de outras sementes por número (DOSN), teste de germinação e teste de tetrazólio. O estudo demonstrou que 75% das amostras analisadas atingiram o mínimo estabelecido para comercialização quanto a pureza física; 95% das amostras estavam dentro do padrão para qualidade fisiológica exigidos pela lei; e 91,9% não ultrapassaram os limites máximos do número de sementes indesejáveis presentes em uma amostra. No geral 36,1% do total de amostras analisadas possuía alguma inconformidade no padrão de qualidade, sendo reprovadas para comercialização.
Palavras-chave: fiscalização; comércio; *Urochloa; Panicum.*

Introduction

The Brazil has an area of 162.2 million hectares of pastures (natural and sown) that are used to feed a herd of approximately 214.7 million heads of cattle (AVILA, 2019). Within the national scenario, Mato Grosso ranks first in number of cattle herds, with about 29.8 million head of cattle (INDEA-MT, 2019) having a great

demand for pasture, which is one of the most used and economic for cattle feed, and a large part of the area used is covered with forage.

However, for the success of forage production to occur, it is necessary that, in its implementation, priority is given to the acquisition of high-quality seeds, which will enable the formation of more productive pastures (CUNHA, 2014). Brazil is the world's largest producer, exporter, and consumer of tropical forage grass seeds, moving more than R$ 1.4 billion a year in the legal tropical seed market (ASMANN, 2018).

As Brachiárias (*Urochloa brizantha, ruziziensis, decumbens* and *humidicola*) are the most used by Brazilian livestock, it is estimated that 60% of the volume of seeds produced in the country belongs to this genus, because they are rustic and resistant to less fertile soils and drought, followed by the genus_*Megathyrsus*, cultivar Mombaça, in much smaller areas, as it requires greater soil fertility, in addition to being most used to finishing cattle (ASMANN, 2018; AVILA, 2019; BISCOLA *et al.*, 2013).

The growing use of forage seeds in the country is mainly due to the renewal of degraded pastures, in addition to serving as a source of mulch for the cultivation of other crops and in the crop-livestock integration. In modern livestock, forage fields are reformed more frequently, to support a greater amount of cattle per hectare. In agriculture, forage sowing to mulch is used annually for direct planting. On the other hand, in the livestock farming integration, the use of seeds takes place in the interval of three to four years (BENTO, 2011).

However, to obtain good quality pastures, regardless of the purpose, it is necessary to use high quality seeds, which express all their genetic potential in the field (TERNUS, 2017). For the seed to be considered of high quality, it must have physiological and sanitary characteristics, such as high germination and health rates, as well as guarantee of physical and varietal purity, and not contain weed seeds (FUNDAÇÃO RIO VERDE, 2014).

In this way, the federal government, to guarantee the identity and quality of the seeds produced, marketed, and used throughout the national territory, regulated standards to be followed (PESKE, 2016). Federal law n° 10.711, of August 5, 2003, known as the Seed Law, is in force. The minimum quality standards for seeds of cultivated species, is established with Normative Instruction No.30, of May 31, 2008, which regulates the standards for the production and marketing of seeds of forage species in tropical climate, being the main standardized criteria: physical purity, germination, number of seeds of other cultivated species, number of wild seeds, number of harmful seeds tolerated, and number of harmful seeds prohibited (BRAZIL, 2008).

Despite current legislation, forage seeds still have low physical, physiological and sanitary quality when compared to seeds from crops (CRUZ, 2019). Having a study reporting that more than 60% of forage seed samples sold in Brazil were below the minimum quality standards required by current legislation, and the main factors of low quality are purity and the presence of noxious weeds tolerated (ALMEIDA, 2007).

However, the government must exercise the role of inspector, carrying out the external control of seed quality, to ensure the quality, identity and origin of the seeds commercialized based on the law and current regulations. In some states, this work is carried out by state governments, in which, in addition to inspecting all documentation of seed marketing, official seed samples are carried out to analyze their quality (TERNUS *et al.*, 2016).

In this perspective, the state of Mato Grosso, through the Institute of Agricultural Defense of the state of Mato Grosso – INDEA-MT, promotes the external control of seeds sold in its territory, which fundamentally contributes to the matogrossense agribusiness chain. In this sense, the objective was to know the scenario of physical purity, germination or viability, and the presence of other seeds by number, in official samples of tropical forage seeds from commercial establishments and rural properties in the state of Mato Grosso, in the year of 2018.

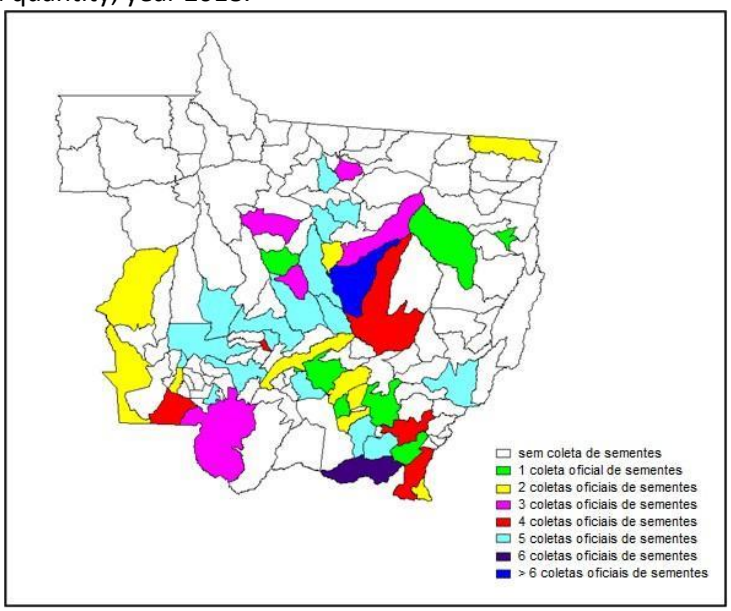
Material And Methods

The work was conducted with the Seed and Seedling Inspection Program, of the Plant Sanitary Defense Coordination, linked to the Institute of Agricultural Defense of the State of Mato Grosso (INDEA-MT), headquartered in Cuiabá, as authorized by the administrative process under protocol No. 192137/2019. Official samples of forages sampled by the State

Inspectors for Agricultural and Forestry Defense (FEDAF) of INDEA-MT were used in 45 municipalities in the state (Figure 1), during 2018 (January-March and October-December).

The collections were carried out in establishments registered as seed traders and in final consumers, at random. The samples were collected within the precepts established by the Rules for Seed Analysis (RAS), obeying the criteria of minimum sampling intensity per batch (BRASIL, 2009). A total of 158 official samples collected (Figure 1).

Figure 1. Municipalities where official forage collections were carried out in the State of Mato Grosso, illustrating the sampled quantity, year 2018.



To carry out the analysis, the official seed samples were sent to the Guilherme de Abreu Lima Seed Analysis Laboratory (LASGAL), from INDEA-MT, in Cuiabá-MT. LASGAL performs all analyzes of its scope following the criteria established in the Rules for Seed Analysis (RAS), without any kind of interference from the inspector responsible for the sampling of seeds.

The following analyzes were performed: purity analysis, determination of other seeds by number (DOSN), germination test (for seeds that were marketed with the germination information) and tetrazolium test (for seeds that were marketed with the information of viability). After performing the analyses, LASGAL issued the official seed bulletins (BASO) containing the results of the analyses. From where the information regarding the physical and physiological quality of the seeds was extracted.

Data analyzes were performed using descriptive statistics, using the Microsoft® Excel program, version 2019, which counted the percentages of samples that were outside the legal standards established by Normative Instruction No. 30/2008 (BRAZIL, 2008).

Results and Discussion

The results of the analysis of seed samples collected in the State of Mato Grosso, in the year 2018, showed that the species of the genus *Urochloa* correspond to 82.2% of the analyzed samples. Macedo (2018), showed that there was a similar result, in which he obtained 71.1% of the seeds of the genus *Urochloa* being commercialized. In the state of Rondônia, this genus predominated in the results of samples collected by inspectors of the Agricultural Health Defense Agency of the state of Rondônia (IDARON), with 70 to 81.2%, during the harvests of 2011/2012, 2012/2013, 2013/2014 (SILVA, 2015).

Among the analyzed forage species, *Urochloa brizantha* proved to be the most preferred for the implantation of pastures in production fields in the state of Mato Grosso, with 41.1% (Table 1). However, according to Parmejiani *et al.* (2014), in the state of Rondônia,

the species *U. brizantha* presented 68% of the representativeness of the samples analyzed in the 2012/2013 harvest.

The high demand for this species was caused by its agronomic characteristics, such as high productivity, high tillering, and resistance to spittlebug, in addition to developing well in soils of low fertility and low water availability (EMBRAPA, 1984). The *U. ruziziensis* species was the second most sampled with 38.6% (Table 2) of the total samples. Quite different from what was analyzed in the state of Paraná in 2008, 2009 and 2010, where the species obtained 7, 8 and 5% respectively (OHLSON *et al.*, 2009; 2011).

The results found in this study can be easily explained by the growing use of *U. ruziziensis* in agricultural areas of the state, being used in crop-livestock integration system (ILP), intercropping with corn and as mulch, due to its ease of being controlled with herbicides (HERNANI *et al.*, 2013; PARIZ *et al.*, 2010). The third species was Panicum maximum, with 17.8%, followed by *U. humidicola* (1.9%) (Table 1).

The number of samples of the *U. decumbens* species had low representation, with only 0.6% (Table 1). According to the data presented by the authors Ohlson *et al.* (2011), the seed samples collected by the Department of Inspection (DEFIS) of the State Secretary of Agriculture and Supply of Paraná (SEAB-PR), for this species also showed low representation with 5 and 3% in the years 2009 and 2010 respectively.

Despite initially having formed millions of hectares in Brazil, having good agronomic characteristics, being indicated for use in areas of low fertility and prolonged drought, the species is highly susceptible to leafhoppers in pastures, causing sensitization in calves and is not consumed by horses (VELASCO, 2011; VALLE *et al.* 2004).

Table 1. List of species and their respective representations in the total of analyzed seed samples, from official seed collections in the state of Mato Grosso, year 2018.

Species	% of analyzed samples of each species
Brachiaria brizantha - Urochloa brizantha (Hochst. ex A. Rich.) R. D. Webster	41.1
Brachiaria decumbens - Urochloa decumbens (Stapf) R. D. Webster	0.6
Brachiaria humidicola - Urochloa humidicola (Rendle) Morrone & Zuloaga	1.9
Brachiaria ruziziensis - Urochloa ruziziensis (R. Germ. & C. M. Evrard) Crins	38.6
Panicum maximum Jacq.	17.8

Of the total of 158 samples collected (Table 2), 154 samples belonged to seed category S2 and 4 samples belonged to seed category S1, of which 3 were from *Panicum maximum* and 1 from *U. ruziziensis*.

As reported by Pedreira *et al.* (2014), a large part of the areas cultivated with forages within the state of Mato Grosso are with *U. brizantha*, cultivar Marandú, but in the samplings carried out by the inspectors of INDEA-MT, a greater predominance of the cultivar *Brachiaria ruziziensis* of the species *U. ruziziensis*, in the amount of 61 samples (38.60%), while the cultivar Marandú of the *U. brizantha* species was the second most sampled, with 36 samples (22.78%) (Table 2).

Table 2. Number of samples collected from each cultivar by species and total amount, from official seed collections in the state of Mato Grosso, year 2018.

Species	Grow crops	Number of samples collected
Brachiaria brizantha - Urochloa brizantha (Hochst. ex A. Rich.) R. D. Webster	BRS Paiaguás	1
	BRS Piatã	16
	Marandú	36
	MG = 5 Vitória= Toledo = Xaraés	12
Brachiaria decumbens - Urochloa decumbens (Stapf) R. D. Webster	Basilisk	1
Brachiaria humidicola - Urochloa humidicola (Rendle) Morrone & Zuloaga	Llanero	2
	Brachiaria humidicola	1
Brachiaria ruziziensis - Urochloa ruziziensis (R. Germ. & C. M. Evrard) Crins	*Brachiaria ruziziensis*	61
Panicum maximum Jacq.	BRS Zuri	9
	Massai	6
	Mombaça	13
Total Samples Analyzed		158

To be marketed, the seeds must meet what is recommended by legislation: the minimum requirements for physical and physiological qualities. Therefore, the results were compared as established by legislation for physical purity, germination or viability and number of other seeds, according to MAPA Normative Instruction No. 30/2008, for categories S1 and S2 (Table 3).

Table 3. Standard for commercialization of seeds of *P. maximum, U. brizantha, U. decumbens, U humidicola, U. ruziziensis*, for category S1 and S2.

Parameters	**Seed pattern ***				
	Urochloa brizantha	***Urochloa decumbens***	***Urochloa humidicola***	***Urochloa ruziziensis***	***Panicum maximum***
Pure seed (%)	60	60	60	60	*40*
Germination or Viability (%)	60	60	60	60	*40*
No. of seeds from Others Cultivated Species	30	30	30	30	*30*
No. of Wild Seeds Common	40	40	40	40	*40*
No. of Tolerated Noxious Seeds	50	50	50	50	*50*
No. of Harmful Seeds prohibited	**0**	**0**	**0**	**0**	***0***

*Adapted from the Annex Norms and Standards for Production and Marketing of Supervised Seeds of Forage Species in Tropical Climate (Brazil, 2008).

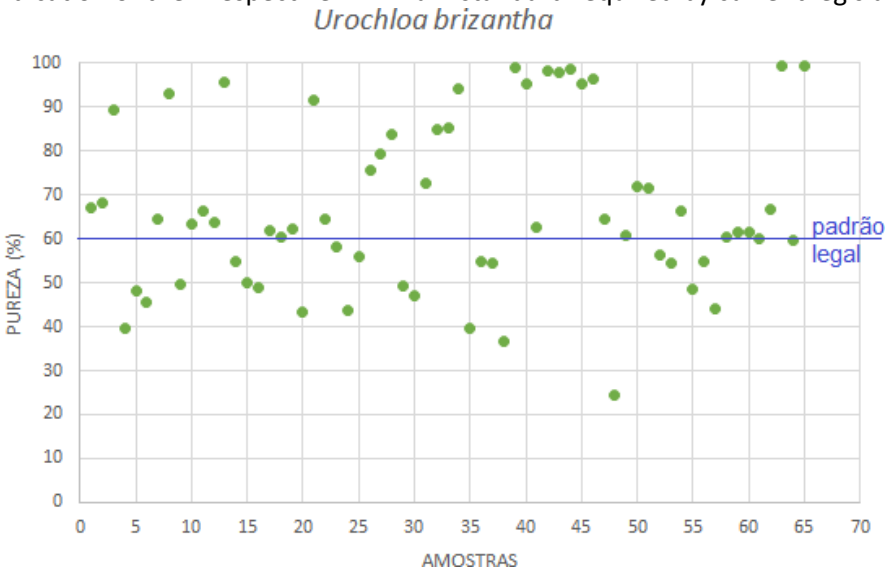
In the results obtained by the physical purity test, it was verified that of the 65 samples of *U. brizantha* seeds evaluated, 24 of them (36.9%) disagreed with the minimum standards for the commercialization of the species, which is 60%, samples with up to 24.4% purity were verified (Figure 2). According to Parmejiani *et al.* (2014), of the 106 analyzed samples of *U. brizantha* seeds, more than 75% disagreed with the minimum standards. Laura *et al.* (2009), also

found that of the 6 samples analyzed, 66.6% did not present physical purity that met the current legislation for the *U. brizantha* species.

It is noteworthy that of these 65 samples of *U. brizantha* collected, 10 samples had coating (encrusted seeds), these presenting physical purity between 89.5 and 99.6%. The incrustation can be used with the objective of guaranteeing the physiological and physical quality of forage species seeds. The coating is an efficient technique for the initial establishment of pastures, facilitating the sowing operation in no-tillage systems (OLIVEIRA *et al.*, 2003).

Silva *et al.* (2019) worked with 10 samples of the cultivar BRS Piatã of the *U. brizantha* species, coming from several Brazilian states, and observed that in 8 the physical purity was greater than the minimum value for commercialization established by the MAPA norms for the species. Barros Ribeiro *et al.* (2016) also analyzed the same cultivar that was being marketed in Goiânia and found that it had the highest purity, with 96.6%. In the results of the collections carried out by INDEA-MT, from the total of 16 samples of the cultivar BRS Piatã, 50% were being marketed with purity below the standard established by law.

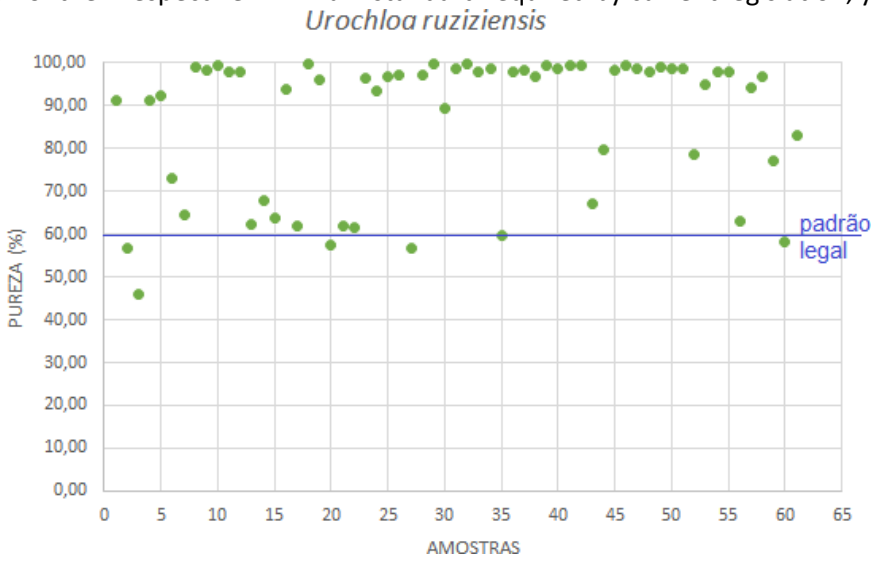
Figure 2. Results of the "Physical Purity" tests, of all analyzed samples of *U. brizantha* (syn. *B. brizantha*) seeds, with the indication of their respective minimum standard required by current legislation, year 2018.



While for *U. ruziziensis*, of the 61 samples evaluated, only 6 (9.8%) were with physical quality in disagreement with the minimum standards of 60%, with samples with 45.8% purity being verified (Figure 3). This study also found that it had 18 samples of *U. ruziziensis* encrusted, and these had physical purity between 91.4 to 99.8%. Laura et. al (2009) analyzed seeds of *U. ruziziensis* and observed that the average physical purity of the lots was 46.9%, and none of the samples reached the standard established by legislation, unlike what was found in this work, showing the requirement for higher quality by rural producers who use this species in the state of Mato Grosso. According to Pereira *et al.* (2019), Brazilian farmers have become more demanding in relation to their decisions, especially about seed quality.

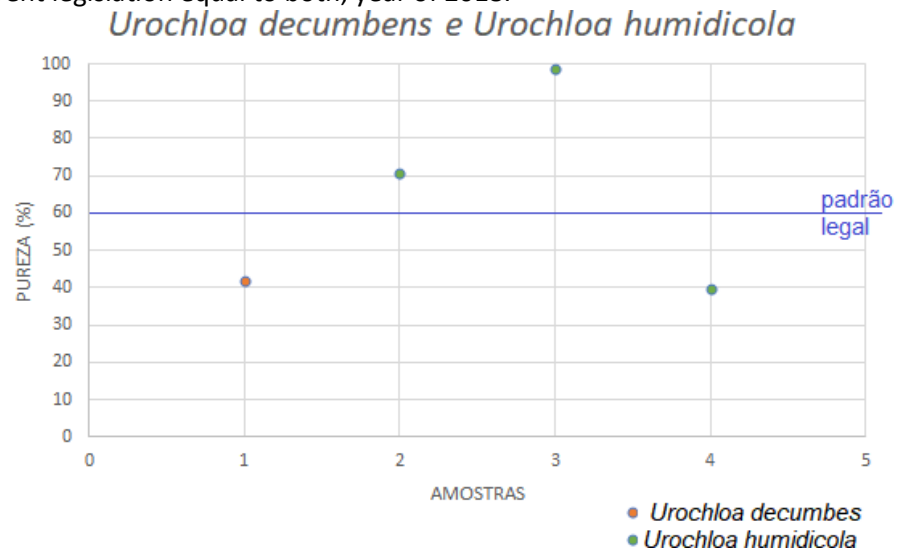
The only sample of *U. decumbens* showed physical purity below that established by legislation, with 41.6% (Figure 4). In a study by Silva *et al.* (2019) approximately 33% of the *U. decumbens* production fields had seed lots with values below the standards established by the /Ministry of Agriculture for commercialization, with purity between 40.4 and 56.3%. According to Laura *et al.* (2009), in general, this is the species of *Urochloa* with the lowest purity, with an average of 46.9%.

Figure 3. Results of the "Physical Purity" tests of all analyzed samples of *U. ruziziensis* (*B. ruziziensis*) seeds with the indication of their respective minimum standard required by current legislation, year 2018.



However, of the three samples of seeds collected from *U. humidicola*, two samples were within the standard (70.7 and 98.9%) and one below the standard established by legislation, with 39.7% (Figure 4). The sample with the highest purity value found (98.9%) was an encrusted seed sample. In the state of Rondônia, the seeds of *U. humidicola*, commercialized in the 2012/2013 harvest, 63.6% of the samples were below the minimum of 60% purity, with samples with up to 19.7% being verified (PARMEJIANI *et al.*, 2014). However, according to Pereira *et al.* (2019), the seeds of *U. humidicola*, because they are collected from the bunch, present greater physical purity.

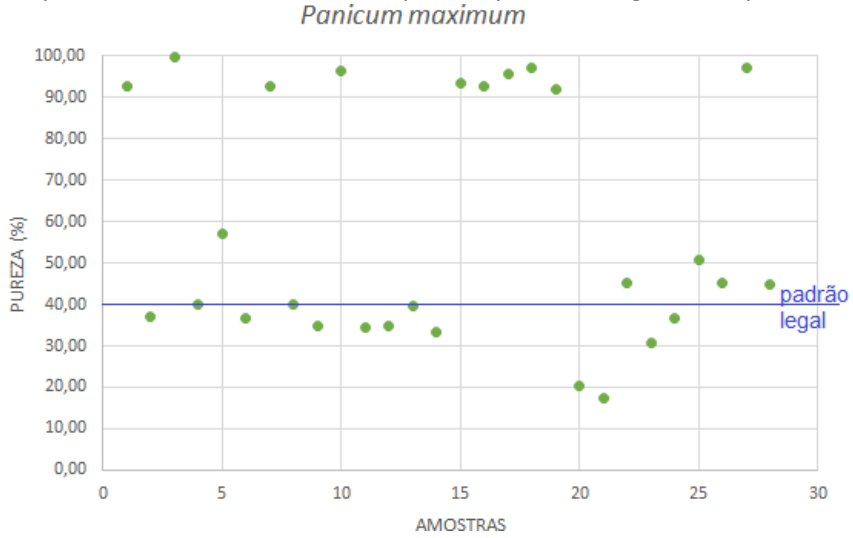
Figure 4. Results of the "Physical Purity" tests, of all analyzed samples of seeds of *U. decumbens* (syn. *B. decumbens*) and *U. humidicola* (syn. *B. humidicola*) with the indication of the respective minimum standard required by current legislation equal to both, year of 2018.



As for the samples of *P. maximum* seeds, of the 28 analyzed, 12 samples (42.8%) were of lower quality than the minimum required for the physical purity standard, which is 40% for this species, 8 of which were from cultivar Mombaça, even presenting samples with 17.2% purity (Figure 5). In the state of Paraná in the years 2006, 2007 and 2008, the cultivar Mombaça showed 82, 70 and 50% respectively of samples below the standard, which at the time of the study the pure seed standard was 30% (OHLSON *et al.*, 2010).

The Parmejiani *et al.* (2014) in Rondônia, obtained samples of *P. maximum* with up to 10.3% purity, with a total of approximately 92% of the samples analyzed with quality below the minimum required by law. However, Barros Ribeiro *et al.* (2016) in similar studies with the species, showed results of 91% for physical purity. In this study, it was evidenced that 57.2% of the samples of these species were within the standard, and 32.1% of the analyzed samples had physical purity between 91.9 and 99.8% and belonged to samples of encrusted seeds.

Figure 5. Results of the "Physical Purity" tests, of all analyzed samples of *P. maximum* seeds with an indication of their respective minimum standard required by current legislation, year 2018.



Thus, of the 158 samples collected from forages, the following result was obtained: 114 (72%) samples were found to have purity within the standard established by legislation, considering the type of species and seed category.

In general, the result of the physiological quality analysis of forage seeds marketed in the state of Mato Grosso, in the year 2018, showed that 95% of the samples were within the physiological quality standard required by Normative Instruction MAPA No. 30/2008, leading into account the category of the seed and the species studied.

The values of the test results for Determination of Other Seeds by Number (DOSN), showed a small percentage of samples above the global limit defined by legislation (Table 4), in which for *U. brizantha* species, 3.1% of the samples presented amount above the allowed for seeds of other cultivated species, having a sample of 912 seeds of other cultivated species, as well as 1.6% of the samples of this species with seeds tolerated in violation of the law, even detecting 130 seeds of harmful species tolerated in a sample, not having samples with a quantity of wild and prohibited seeds above what is established by law.

Analyzing the species, Parmejiani *et al.* (2014), found 2.8% of the samples with the presence of seeds of other species, 0.9% with noxious tolerated seeds, 0.9% with wild seeds and 7.5% with prohibited seeds, above what is allowed by the legislation. Ohlson *et al.* (2011), carried out a study with several *U. brizantha* cultivars, and similarly to this work, they did not detect prohibited seeds in the analyzed samples. However, it can be noted from the results (Table 4), that the number of samples of this species with tolerated noxious seeds, ranging from 1 to 50 seeds, reached 64.3% of the samples.

For the *U. ruziziensis* species, 3.4% of the samples were obtained above the global limit of the legislation for prohibited seeds, with samples containing a prohibited seed (Table 4). Analyzing the data, it was found that the species presented a percentage of 50.8% of the samples with the presence of harmful tolerated seeds, containing samples with a total of 23 seeds.

According to Ternus (2017), in 2014, the average of tolerated harmful seeds detected in batches of black oat, category S2, was 21 seeds.

Considering that the sowing density was 60 kg. ha^{-1}, it was estimated that, together with the seeds of the forage species, approximately 2,500 weed seeds per hectare would be distributed. Thus, analyzing the data on the number of noxious seeds tolerated found in samples of the species *U. brizantha* and *ruziziensis*, the most cultivated in the state of Mato Grosso, it raises an alert about the risk of introducing a new pest (weeds) in the fields, or even its increase in areas where it is already predominant, even if the use of seeds is within the standard established by the current legislation.

The results of the DOSN test for the *U. humidicola* species did not show any samples above the global limits established by legislation for other cultivated seeds, wild seeds, noxious tolerated seeds and prohibited seeds. However, even within the standard, it was verified in some samples the total amount of 25 seeds of tolerated species. Unlike Silva (2015), who in the 2011/2012 harvest, obtained samples above the standard limit, with 18.2% of samples with wild seeds and 9.1% with noxious tolerated seeds, even having samples with a total of 290 tolerated noxious seeds; in the 2012/2013 harvest, 9% of the samples contained wild seeds above what is allowed by legislation; and in the 2013/2014 harvest 20% with other species cultivated above the quantity of 40 seeds allowed by law.

The species of *U. decumbens* was within the standard that is stipulated by legislation for other seeds by number within a sample, with only seeds of other cultivated species being verified, in a total of 11 seeds.

Like the results of Ohlson *et al.* (2010), who worked from 2006 to 2008 with the species *P. maximum*, in this study the samples also did not present prohibited seeds. Although it is noticed that the studied samples had seeds of other cultivated species, wild seeds and noxious seeds that were tolerated, none of the samples reached the limit so that their commercialization could not be carried out. Of the 28 *P. maximum* samples, 82.1% had no seeds of cultivated species, 67.8% had no wild seeds and 57.1% had no seeds of tolerated noxiousness.

Still on the data from the test of other seeds by number, it can be seen from the total of analyzed samples, some did not present any type of undesirable seeds, being *U. brizantha* 4.6%, *U. ruziziensis* 8.2%, *P. maximum* 14.3%, all from encrusted seeds.

It should be considered that seeds sold below the standard, bring significant damage to agriculture and livestock, highlighting the likely appearance of invasive plants that did not exist in the area until then, probable increase in the use of herbicides to control invasives, and the consequent contamination of the environment and people, in addition to the longer time spent in the formation of pasture (MACEDO *et al.*, 2005).

Table 4. Results of the test of Other Seeds by Number in samples of forage lots commercialized in the State of Mato Grosso, with the percentage below the minimum standard and the largest number of seeds of other cultivated, wild, tolerated and prohibited species found in the evaluation of the samples of each species, year 2018.

Analyzed Data	Species				
	Urochloa brizantha	*Urochloa ruziziensis*	*Urochloa humidicola*	*Urochloa decumbens*	*Panicum maximum*
No. of other cultivated seeds					
0	80%	68.8%	33.33%	-	82.1%
1 -10	15.4%	27.8%	33.33%	-	17.9 %
11 - 30	1.5%	3.3%	33.33%	100%	0%
> 31 (above allowed)	3.1%	-	-	-	-
Highest total amount obtained	912	21	13	11	2
Number of wild seeds:					
0	70.8%	78.7%	66.7%	-	67.8%
1 -10	29.2%	21.3%	33.3%	-	28%
11 - 40	-	-	-	-	4.2%
> 41 (above allowed)	-	-	-	-	-
Highest total amount obtained	4	7	2	-	25
Number of harmful seeds tolerated:					
0	33.8%	50.8%	66.7%	-	57.1%
1 -10	49.2%	41%	-	-	39.3%
11 - 50	15.4%	8.2%	33.3%	-	3.6%
> 51 above allowed	1.6%	-	-	-	-
Highest total amount obtained	130	23	25	-	13
Presence of prohibited seeds:					
0	100%	96.6%	100%	100%	100%
≥ 1 (above allowed)		3.4%			
Highest total amount obtained	-	1	-	-	-

The publication of a new Normative Instruction is awaited, with norms and standards of identity and quality for the production and commercialization of seeds of tropical forage species, aiming at a greater guarantee of identity and quality, which provides that the purity standard of the coated seeds for the genus *Urochloa* is 95% and for the species *P. maximum* 85%. The purity standard of *U. brizantha*, *decumbes* and *ruziziensis* and *humidicola* species in this new IN predicts that it will be changed to 80% for categories S1 and S2, in addition to changing the global limits of seeds of other cultivated species and wild invasive seeds which would become 30 (maximum number per sample) and for tolerated seeds would be 40 (BRAZIL, 2013).

However, the state of Mato Grosso should regulate more restrictive minimum standards of propagation materials produced and marketed for Mato Grosso producers, mainly on the maximum global limits resulting from the DOSN test, in addition to making producers

aware of the importance of using high-quality seeds quality.

Conclusions

Based on the results obtained in the survey, it can be considered that 36.1% of forage seeds commercialized in the state of Mato Grosso disagree with the minimum physical and physiological quality standards required by law.

The main parameter of low quality evaluated for the commercialization of the species is the physical purity, with 28% of nonconformities.

The percentage of irregular samples per species was found to be 41.5% *U. brizantha*, 22.9% *U. ruziziensis*, 67% *U. humidicola*, 100% *U. decumbens*, 46.4% *P. maximum*.

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