# Fixed versus variable rest period effects on herbage accumulation and canopy structure of grazed 'Tifton 85' and 'Jiggs' Bermuda grass

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Abstract – The objective of this work was to evaluate the effects of variable and fixed rest periods on the forage production, plant-part composition, and canopy structural characteristics of 'Tifton 85' and 'Jiggs' Bermuda grass (*Cynodon* spp.) pastures under rotational stocking. The treatments were two grass cultivars (Jiggs and Tifton 85) and two rest periods (grazing starting whenever the canopy reached 25 cm or every 28 days, regardless of canopy height). A completely randomized experimental design, with a 2×2 factorial arrangement (two grass cultivars and two managements), was used with three replicates. The experiment was carried out during the summer growing season in Piracicaba, SP, Brazil. Pre- and post-grazing forage mass chacteristics were evaluated. 'Jiggs' and 'Tifton 85' canopies had similar light interception (96.8%) at pre-grazing, for fixed and variable rest periods; however, they showed different canopy structural characteristics. 'Jiggs' had greater stem proportion, greater canopy height during pre-grazing, and lower leaf area index. There were no differences between strategies and between grass cultivars for total yield, which averaged 16.8 Mg DM $ha^{-1}$. Fixed and variable rest periods can be used for 'Tifton 85' and 'Jiggs' Bermuda grass.

Index terms: *Cynodon*, canopy height, grazing frequency, light interception, pasture management, regrowth.

# Efeitos de períodos de descanso fixo e variável no acúmulo de forragem e estrutura do dossel de capim-bermuda 'Jiggs' e 'Tifton 85' sob pastejo

Resumo – O objetivo deste trabalho foi avaliar os efeitos do uso de períodos de descanso fixo e variável sobre a produção de forragem, a composição morfológica e as características estruturais de dosséis dos pastos de capim-bermuda 'Tifton 85' e 'Jiggs' (*Cynodon* spp.), sob lotação rotacionada. Os tratamentos consistiram de duas cultivares de capim (Jiggs e Tifton 85) e dois períodos de descanso (pastejo sempre que o dossel atingisse 25 cm ou a cada 28 dias, independentemente da altura do dossel). Utilizou-se o delineamento inteiramente casualizado, em arranjo fatorial 2x2 (duas cultivares de capim e dois manejos), com três repetições. O experimento foi realizado durante o cultivo de verão, em Piracicaba, SP. Avaliaram-se as características de massa de forragem no pré- e no pós-pastejo. Dosséis de 'Jiggs' e 'Tifton 85' apresentaram valor similar de interceptação da radiação incidente (em média, 96,8%) no pré-pastejo, nos períodos de descanso fixo e variável; no entanto, apresentaram diferenças quanto às características estruturais do dossel. 'Jiggs' apresentou maior proporção de colmo, maior altura do dossel no pré-pastejo e menor índice de área foliar. Não houve differenças entre as estratégias de pastejo e entre as cultivares quanto ao acúmulo total de forragem, que obteve produção média de 16.8 Mg $ha^{-1}$ MS. Os períodos de descanso fixo e variável podem ser utilizados para os capins 'Tifton 85' e 'Jiggs'.

Termos para indexação: *Cynodon*, altura do dossel, frequência de pastejo, interceptação de luz, manejo da pastagem, rebrotação.

## Introduction

*Cynodon* grasses have been successfully used worldwide in tropical and subtropical areas, mainly for hay production and grazing. 'Tifton 85' (*Cynodon* spp.) is one of the most productive genotype among them for its high-nutritive value, and it is considered one of the best *Cynodon* cultivars released to date (Hill et al., 2001; Hanna & Anderson, 2008; Baseggio




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et al., 2015). Introduced in Brazil following the official release, 'Tifton 85' has become one of the most popular *Cynodon* grasses in the country.

'Jiggs' (PI 671960) [*Cynodon dactylon* (L.) Pers.] is a new Bermuda grass ecotype that is receiving great attention by producers in the USA and Brazil (Aguiar et al., 2014; Scaglia & Boland, 2014; Silva et al., 2015, 2016). This grass is a sprig- or top-planted Bermuda grass released in Texas, and tolerates poorly drained soils (Bade, 2000). Annual herbage accumulation (HA) is greater than that of most the other Bermuda grass, and it is comparable to that of 'Tifton 85' (Mislevy et al., 2008; Vendramini et al., 2010), with greater potential for HA during the cool season than 'Tifton 85' (Silva et al., 2015). However, 'Jiggs' has shown less forage in vitro digestible organic matter (IVDOM) concentration than 'Tifton 85' (Mislevy et al., 2008; Vendramini et al., 2010; Silva et al., 2015). It has been widely distributed in Brazil in recent years, but research-based recommendations for its management under grazing are scarce.

Most of grazing management schemes for intensively managed, improved tropical grasses are based on fixed grazing intervals, often varying from 28 to 42 days during the warm, rainy growing season (Pedreira et al., 2007, 2017b; Pequeno et al., 2015; Silva et al., 2015). The use of 95% light interception (LI) by the forage canopy has been proposed as the time at which grazing should start (Silva et al., 2009). This method consists of interrupting the regrowth when the forage accumulation rate is maximum, and the critical leaf area index (LAI) is reached. Light interception beyond 95% causes the senescence and stem growth rates to increase sharply, decreasing forage-nutritive value and leaf production in many grasses. The use of canopy height targets to start and end the grazing event, under rotational management systems, is a practical recommendation in the management of several grasses in Brazil due to its relationship with canopy structure descriptors, such as LI and critical LAI. This procedure alledgedly contributes to a greater grazing efficiency and animal productivity (Silva, 2015).

Despite these advantages, the use of canopy height as a grazing management criterion has been considered less practical and time consuming than the conventional use of fixed rest periods due to the need for frequent measurement of canopy height. In addition, even for 'Tifton 85', a widely known cultivar tested at many locations under different managements, the advantages of LI and canopy height as criteria for grazing management has not been studied as to fixed rest periods. Information is needed to provide reliable grazing management guidelines to producers for 'Tifton 85' and other recently introduced Bermuda grass such as 'Jiggs'.

The objective of this work was to evaluate the effects of variable and fixed rest period on the forage production, plant-part composition, and canopy structural characteristics of 'Tifton 85' and 'Jiggs' Bermuda grass pastures under rotational stocking.

## Materials and Methods

The experiment was carried out at the Universidade de São Paulo, Escola Superior de Agricultura Luiz de Queiroz (USP-Esalq), in Piracicaba, SP, Brazil (22º42'S, 47º30'W, at 546 m altitude). The soil in the experimental site is a highly fertile Kandiudalfic Eutrudox (Soil Survey Staff, 1990). Average soil chemical characteristics were: pH (0.01 mol $L^{-1}$ $CaCl_2$), 5.8; organic matter, 24 g $dm^{-3}$; P, 39 g $dm^{-3}$ (ion-exchange resin extraction method); base saturation, 79%; $SO_4$ $m^{-3}$, 14 g; K, 5.3 $mmol_c$ $dm^{-3}$; Ca, 58 $mmol_c$ $dm^{-3}$; Mg, 31 $mmol_c$ $dm^{-3}$; H+Al, 25 $mmol_c$ $dm^{-3}$; sum of bases, 94 $mmol_c$ $dm^{-3}$; and cation exchange capacity, 119 $mmol_c$ $dm^{-3}$. Weather data for the experimental period (Table 1) were obtained from a station located 2 km from the experimental area.

'Tifton 85' and 'Jiggs' were evaluated under two grazing management strategies: 25 cm canopy height, or 28-day rest as criteria to start grazing. The pastures were established in December 2009 using well-fertilized stem cuttings. Starting 60 days after stablishment, the grasses were periodically grazed (average rest period of 35 days), to stimulate tillering and ensure good establishment of the pastures. The canopy height of 25 cm was chosen because it has been related to 95% LI that is recommended to initiate grazing on 'Tifton 85', considering that the canopy height for other Bermuda grass cultivars ranges from 25 to 30 cm (Silva, 2015). In both treatments, a 10 cm stubble height was chosen as the condition to terminate defoliation. A completely randomized experimental design with a 2×2 factorial arrangement (two grasses and two managements) was used with three replicates, totaling 12 experimental units (12.5x9.5 m paddocks).

Before the beginning of the experimental period, all paddocks were mechanically mowed to an 8 cm stubble height. Subsequently, nonextended and noncompressed canopy height were monitored weekly by taking 30 readings per paddock, using a light polyethylene sheet and a graduated measuring stick, and grazed according to grazing treatments. A mob-stocking technique was used to impose the grazing each time the canopy reached the treatment conditions of 25 cm height or 28-day rest period. A group of four animals [nonpregnant, nonlactating crossbred dairy cows (*Bos* sp.)] weighing ca. 450 kg body weight were used to graze the pastures. Nitrogen and potassium were applied using 260 kg $ha^{-1}$ of N and the same amount of $K_2O$, as urea and potassium chloride, respectively, during the summer grazing season. Considering that the number of grazing events and, thus the length of the regrowth periods, might be different between managements, the total annual amount of fertilizer was divided by the average duration of the growing season in the location, and a daily rate of fertilizer application was multiplied by the number of days in each rest period since the previous grazing event, to determine the amount to be applied after each grazing event (post-grazing). The considered experimental period was from October 26, 2010 to April 28, 2011.

Herbage mass (HM) at pre- and post-grazing was estimated using a rising plate meter (Ashgrove, Palmerston North, New Zealand). In each pasture, 40 plate measurements were taken before the first grazing in October, and every pre- and post-grazing thereafter. The plate was calibrated every two grazing cycles using the double sampling technique – both pre- and post-grazing. In each calibration event three sampling sites were chosen per padock, representing maximum, medium, and minimum HM by visual assessment. At each of those sites, a plate reading was taken followed by clipping the forage inside a circular 0.25 $m^2$ frame to the soil level using electric clippers. The harvested forage was dried in a forced-air oven at 60°C until constant weight was obtained. Using these samplings, regression models were developed using PROC REG of SAS (SAS Institute Inc., Cary, NC, USA) to estimate HM from mean plate readings in the pre- and post-grazing (Wilm et al., 1944). The $R^2$ means for 'Jiggs' were 0.66 and 0.60, and for 'Tifton 85' they were 0.61 and 0.53, at pre- and post-grazing, respectively. The mean plate reading at pre- and post-grazing of each pasture was entered into the respective equation to estimate HM on each sampling date. Herbage accumulation was calculated as the HM at pre-grazing minus the HM in the paddock at the previous post-grazing; daily herbage accumulation rate (HAR) was calculated by dividing HA by the number of days of the regrowth interval. The total annual HA was calculated as the sum across grazing cycles within the growing season.

The samples from the "medium" sites (chosen by visual assessment) of the pre- and post-grazing calibrations were taken to the lab. These samples were hand-separated into leaf blades, stem (stem + sheath), and dead material, which were dried in a forced-air drier at 60°C, until constant weight was achieved, and then samples were weighed. The dry weight of each fraction was used to determine the relative proportion of leaf, stem, and dead material in the HM.

The average nonextended and noncompressed canopy height was measured weekly as previously described. The canopy light interception (LI), LAI, and leaf angle were measured every seven days during the regrowth period, starting immediately after grazing, and ending immediately before the next grazing, using

**Table 1.** Monthly weather data at the experimental site, during the evaluation period.

| Weather variable | October | November | December | January | February | March | April |
|---|---|---|---|---|---|---|---|
| | | | | 2010–2011 | | | |
| Maximum temperature (ºC) | 28.6 | 30.5 | 30.7 | 31.0 | 31.9 | 28.2 | 28.7 |
| Minimum. temperature (ºC) | 15.4 | 17.5 | 19.9 | 20.2 | 20.2 | 19.4 | 17.2 |
| Rainfall (mm) | 87.4 | 39.9 | 244.1 | 421.7 | 145.5 | 222.2 | 135.1 |
| | | | | Historic average(1) | | | |
| Maximum temperature (ºC) | 29.1 | 29.6 | 29.7 | 29.9 | 30.3 | 30.0 | 28.4 |
| Minimum temperature (ºC) | 15.7 | 16.8 | 18.2 | 19.0 | 19.0 | 18.2 | 15.5 |
| Rainfall (mm) | 110.1 | 130.9 | 198.7 | 230.3 | 183.1 | 143.3 | 63.6 |

(1)Historic average data from 1917 to 2009.

a model LAI 2000 canopy analyzer (LI-COR, Lincoln, NE, USA) (Welles & Norman, 1991).

Data were analyzed using PROC Mixed of SAS (SAS Institute Inc., Cary, NC, USA, 2013). Grass and management were considered fixed effects, and the covariance structure was chosen based on the parameters of the Akaike's information criteria (Wolfinger, 1993). Treatment means were compared using PDIFF by the Tukey's test, at 5% probability, and least squares means were reported.

## Results and Discussion

Neither herbage accumulation (HA) nor herbage accumulation rate (HAR) were affected by grass or management (p>0.05). 'Tifton 85' and 'Jiggs' showed similar seasonal HA (16.8 Mg ha$^{-1}$ DM) and mean HAR (93 kg DM ha$^{-1}$ per day), when grazed either every 28 days or at 25 cm canopy height. Silva et al. (2015) studied 'Tifton 85' and 'Jiggs' responses to three harvest frequencies, and they reported no differences for HA when grasses were harvested every 14, 28, and 42 days during the warm season. Contrasting with the results of the present study, Vendramini et al. (2010) reported that 'Jiggs' had the greatest HA than 'Tifton 85', 'Coastcross-2', and 'Florakirk' during the warm season in Florida. Scaglia & Boland (2014) evaluated 'Tifton 85' and 'Jiggs' grazed every 28 days in Lousiana, during three summer grazing seasons, and reported no differences for HA and animal performance.

Differences in total seasonal yield and mean accumulation rates were expected between managements, since the use of canopy height as a determinant of grazing initiation could result in harvested forage in a similar physiological condition (Silva, 2015). Our results, however, show that 'Jiggs' can be at least as productive as 'Tifton 85' under grazing during the growing season, under both management strategies. Pedreira et al. (2009) compared a fixed rest period (28 days) with two variable rest periods (when the canopy intercepted 95 or 100% of incoming radiation) on grazed Xaraés palisade grass [*Urochloa brizantha* (Hochst. ex A. Rich.) R. D. Webster, syn. *Brachiaria brizantha* (Hochst. ex A. Rich.) Stapf.], and reported no differences for HA, stem proportion, and dead material in the pre-grazing herbage mass.

Despite the similar HA and HAR of 'Jiggs' and 'Tifton 85' under fixed and variable rest periods (p>0.05), grasses differed for canopy structure and morphological characterisitics. The pre-grazing canopy height in grazed paddocks every 28 days was affected by grass (p=0.018) (34 cm for 'Jiggs', and 25.5 cm for'Tifton 85'), suggesting differences for herbage mass distribution in the canopy profile. Silva et al. (2017) compared the growth of 'Tifton 85' and 'Jiggs', and reported taller canopies for 'Jiggs' harvested every 28 days, which was associated with lesser canopy bulk density (112 kg DM cm$^{-1}$ for 'Jiggs', and 150 kg DM cm$^{-1}$ for 'Tifton 85', respectively). They also reported that 'Jiggs' allocated more assimilates to stem than 'Tifton 85', which may have contributed to increased canopy height. The taller canopy height may be a result of increased stem proportion in the herbage mass, which in turn has been known to be detrimental to forage digestibility (Sollenberger et al., 2012).

The average pre-grazing LAI was only affected by grass, and was greater for 'Tifton 85' (Table 2). The lesser pre-grazing LAI for 'Jiggs' seems to be a result of less dry matter partitioned to leaf, in comparison to 'Tifton 85' (Silva et al., 2016). Despite the differences for canopy height and pre-grazing LAI, there was no difference (p>0.05) for canopy LI between grasses nor for rest periods, averaging 96.8% LI. Additionally, there was no difference for mean leaf angle between grasses or managements (p>0.05), averaging 44.2 degrees. This is consistent with the lack of differences for HA and HAR between managements, since canopies were intercepting similar proportions of incident radiation at the end of the rest period. The differences for pre-grazing canopy height and LAI between grasses, and the similarities for LI, HA, and HAR point out differences for growth and dry matter distribution in the canopy profile. This suggests that the association between canopy height and LI are likely genotype-

**Table 2.** Nondestructive leaf area index (LAI), plant-part composition, and leaf:stem ratio of 'Tifton 85' and 'Jiggs' Bemuda grass, as affected by grass.

| Grass | LAI ($m^2$ $m^{-2}$) | Leaf | Stem | Dead | Leaf:stem |
|---|---|---|---|---|---|
| | | ------------- (%) | -------------- | | |
| Jiggs | 4.2 | 34 | 47 | 19 | 0.7 |
| Tifton 85 | 4.8 | 34 | 42 | 24 | 0.9 |
| SE | 0.12 | 1.12 | 1.42 | 1.65 | 0.09 |
| p-value for grass | 0.035 | 0.1613 | <0.0001 | 0.006 | 0.031 |

specific within the *Cynodon* grasses, since grasses showed similar LI at different canopy heights.

Even though the adopted pre-grazing canopy height has been recommended for 'Tifton 85' due to its relationship with LI (Silva, 2015), the average pre-grazing LI was 96.8%, which is above the 95% target. Silva et al. (2017) studied structural characteristics and herbage mass of 'Tifton 85', grazed at 95% LI, besides levels of post-grazing residual LAI, and they reported both greater pre-grazing canopy height and height variation across seasons. They also reported that, during the rainy season, the canopy intercepted 95% of incoming radiation at 33-39 cm, whereas in the dry season 95% LI was reached at 19-26 cm canopy height. It has been reported that, for several species, canopy height is seldom well correlated with light interception and leaf area index across seasons (Coêlho et al., 2014), which may have contributed to the levels of LI being above 95% in the present study. This suggests that it is unlikely that a single “generic” value of canopy height can be established for a given LI value, as suggested by Pedreira et al. (2017a) for the signal grass 'Basilisk' [*Urochloa decumbens* (Stapf) R.D. Webster, Syn. *Brachiaria decumbens* 'Basilisk'].

The number of grazing cycles was similar for both grasses and grazing managements (p>0.05), averaging six grazing cycles during the growing season. This likely contributed to the lack of differences for HA and HAR between grasses and managements. More grazing cycles would have been expected on pastures managed using a variable rest period, although even with differences in pre-grazing canopy height between grazing estategies, pastures showed a similar number of grazing cycles (p>0.05). Pedreira et al. (2000) reported that 'Florakirk' Bermuda grass may assume a more prostrate growth habit, depending on the grazing management, allowing a significant leaf area to remain after grazing. Differences for grass growth under grazing can contribute to differences of post-grazing canopy characteristics. Differently from the result obtained in the present study, Anjos et al. (2016) reported an increase of grazing cycles, when a variable rest (95% LI) period was used on 'Marandu' palisade grass [*Urochloa brizantha* (A. Rich. R.D. Webster), Syn. *Brachiaria brizantha* (Hochst ex. A. Rich) Stapf)], grazed every 30 days (fixed rest period), or when the pasture intercepted 95% (95% LI) of incoming radiation (variable rest period). They also reported that pre-grazing canopy height on pastures managed under light interception (95% LI) (variable rest period) ranged from 33 to 43 cm during the rainy season. In the present study, however, the average canopy height related to 95% LI was used as a target management, and the average lenght of grazing cycle was similar to that of pastures managed based on a fixed 28-day rest period. Pedreira et al. (2017b) studied 'Xaraés' palisade grass grazed every 28 days, at 95% LI, or 100% LI, and reported that the difference between the rest period of pastures grazed every 28 days and 95% LI was very small, which contributed to similar HAR (112 kg DM $ha^{-1}$ per day).

The pre-grazing leaf proportion of total above-ground HM was similar between grasses and managements (p>0.05) and averaged 34%. Stem and dead material proportions for HM were affected only by grass (Table 2). 'Jiggs' had generally greater stem proportion than 'Tifton 85', which is consistent with the results of Silva et al. (2015), who reported that 'Jiggs' had more stem in the harvested HM than 'Tifton 85', when both grasses were clipped at 8 cm every 28 and 42 days. Despite the similarities for leaf proportion between grasses, 'Jiggs' had lower leaf:stem ratio, which is likely a result of differences for stem and dead material proportions between grasses. The lower stem proportion for 'Tifton 85' may translate into an advantage over 'Jiggs' due to the usually negative influence of stems on nutritive value. Silva et al. (2015) found stemmier forage of 'Jiggs' clipped every 28 days, likely resulting in lower IVDOM concetration, in comparison to 'Tifton 85' and 'Vaquero' Bermuda grass. The greater presence of stems in the HM is usually associated with lignified tissue, which contributes to lower IVDOM concentration (Braga et al., 2006).

In the present study, the two grasses showed similar pre-grazing LI under both managements and did not differ for HA and HAR. Pedreira et al. (2007) reported similar LI for 'Xaraés' palisade grass grazed every 28 days and when canopy LI reached 95% during the warm, rainy season. The lack of differences between managements, in the present study, suggests that both fixed and variable rest periods can be used to manage 'Jiggs' and 'Tifton 85' under grazing in the fertilization level and environmental conditions of the study. The use of fixed rest period is more practical for producers, although, under conditions of more rapid growth, as when greater N fertilization rates are used, a fixed rest period of 28 days may result in more mature forage at pre-grazing, which in turn may result in increased senescence and reduced leaf:stem ratio, negatively affecting forage nutritive value (Nave et al., 2010).

The post-grazing stubble mass was not affected by grass or management (p>0.05) (ca. 2,500 kg DM ha$^{-1}$). The grasses showed, however, differences for post-grazing plant-part composition, residual LAI, and stubble LI (Table 3). The leaf proportion was affected only by grass, and leaf area index was affected by grass × management interaction. 'Jiggs' showed less post-grazing leaf proportion (4.5 vs. 8.5%, respectivelly). 'Tifton 85' had greater residual LAI than 'Jiggs' in both grazing managements. The residual LAI of 'Jiggs' was similar between managements (p>0.05), whereas 'Tifton 85' residual LAI reduced under the variable rest compared to the fixed rest period. The lower leaf proportion of 'Jiggs' is likely associated with the reduced residual LAI. Even though 'Jiggs' had lesser residual LAI and pre-grazing LAI (Table 2), its HA was similar to that of 'Tifton 85'. This suggests that these two grasses may differ for leaf and canopy photosynthesis. Silva et al. (2016) reported a greater net assimilation rate for 'Jiggs' [11.5 kg DM m$^{-2}$ (leaf area) per day] than 'Tifton 85' [6.7 kg DM m$^{-2}$ (leaf area) per day], when harvested every 28 days. Lower LAI and leaf proportion at post-grazing can affect forage regrowth (Silva et al., 2016), considering that after grazing, the residual leaf area can contribute to canopy photosynthesis resulting, in turn, in more rapid increase in canopy leaf area and growth rate (Pedreira & Pedreira, 2007). The lower post-grazing LAI and leaf proportion of 'Jiggs' may result in a longer lag phase in early regrowth, and could favor weed encroachment (Clavijo Michelangeli et al., 2010).

**Table 3.** Post-grazing nondestructive leaf area index (LAI) and post-grazing light interception of 'Tifton 85' and 'Jiggs' Bermuda grass, as affected by grass grazing management[1].

| Grazing management | Jiggs | Tifton 85 | p-value for grass |
|---|---|---|---|
| | ---------- (m$^2$ m$^{-2}$) ---------- | | |
| | Non-destructive leaf area index | | |
| 25 cm canopy height | 1.2a | 1.4b | 0.034 |
| 28 days | 1.1a | 1.8a | 0.012 |
| Standard error of the mean | 0.12 | 0.12 | - |
| | Post-grazeing light interception (%) | | |
| 25 cm canopy height | 60a | 67b | 0.023 |
| 28 days | 60a | 75a | 0.013 |
| Standard error of the mean | 1.2 | 1.2 | - |

[1]Means followed by equal letters, within columns, do not differ by the Tukey-Kramer's test, at 5% probability.

The post-grazing LI was affected by a grass × management interaction (p=0.0343) (Table 3). When managed under a variable rest period, the stubble LI was low for both grasses; however, it was greater in 'Tifton 85' regardless of management, which is likely a result of differences in residual LAI. Differences in the stubble characteristics suggest that the grasses differ for growth patterns, since they showed similar HA and HAR, but 'Jiggs' had more stem and had lower pre- and post-grazing LAI. Silva et al. (2016) made a comparative growth analysis on 'Tifton 85' and 'Jiggs', and reported a greater net assimilation rate and relative growth rate for 'Jiggs', but the crop growth rate was similar for both grasses during the summer, suggesting similar HAR and HA. Differences of the distribution of plant-part components in grass canopies can affect nutritive value of the harvested forage, also affecting the subsequent regrowth period due to possible differences in post-grazing herbage mass and composition.

## Conclusions

1. 'Jiggs' is as productive as 'Tifton 85' under rotational stocking.
2. The use of fixed (28 days) or variable (25 cm canopy height) grazing intervals can be adopted to determine grazing frequency.
3. 'Jiggs' produces stemmier forage than 'Tifton 85' under both grazing managements evaluated.

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