

Original Research Article

<https://doi.org/10.20546/ijcmas.2019.808.338>

Influence of Different Date of Irrigation on Growth and Yield of Cumbu Napier Hybrid Grass

M. Suganthi^{1*}, A. Elango² and S.T. Selvan³

*Post Graduate Research Institute in Animal Sciences, Kattupakkam 603 203,
Tamil Nadu Veterinary and Animal Sciences University, India*

*Corresponding author

A B S T R A C T

Keywords

Comparative study,
Cumbu Napier,
Irrigation frequency

Article Info

Accepted:
22 July 2019
Available Online:
10 August 2019

The field experiment was conducted at Post Graduate Research Institute in Animal Sciences, Kattupakkam, Kancheepuram District, Tamil Nadu, India during Feb.to June of 2017-18 to study the irrigation frequency for CN hybrid grass and asses the growth and yield of Cumbu Napier Hybrid grass variety CO-4. The experiment was laid out with Randomised Block Design. The treatment consist of different irrigation frequency such as daily irrigation (T1) alternate day irrigation (T2) once in two days (T3), once in four days (T4), once in six days (T5) once in eight days (T6) once in ten days (T7), once in twelve days (T8) and once in fourteen days (T9) were compared. Among the different irrigation frequency, irrigation at once in four days and irrigation at once in six days significantly increased the growth and yield characters, reduced the cutting frequency, increased number of cuttings and yield of Cumbu Napier Hybrid Grass. These two treatments were comparable with each other. The maximum plant height, number of tillers hill^{-1} , Fodder yield were higher in these treatments. The fodder yield was lower in fourteen days of irrigation and twelve days of irrigation frequency.

Introduction

Farming is risky. Dairy farming will sustain the agriculture in terms of monetary benefit, and supply of manure. In India dairy farming is largely depends on the fodder of high nutritional value, which accounts for 65-70.per cent expenses. In India only 8.6 m ha land is available for fodder cultivation (Kadam, *et al.*, 2017) and our country may face the shortage of both green as well as dry fodder by about 61.1 and 21.95, respectively (IGFRI, 2011). Cumbu Hybrid Napier plays

an important role in meet the requirement of green fodder in dairy farming. It is developed by the Tamil Nadu Agricultural University, Coimbatore, India. CN hybrid grass is highly recommended because of its high tillering capacity, regeneration capacity, leaf to stem ratio, resistance of pest and diseases, green forage yield, crude protein content and in free from adverse factors along with other fodder varieties grown in the country. To obtain maximum yield proper management practices such as application of fertilizer at correct time, irrigation management in drought spells,

cutting at the suitable height and interval is essential (Suganthi *et al.*, 2019). Low productivity of dairy animals could be accredited to the less availability of forage together with poor quality.

To maximize the milk production, it is essential to feed animals with quality green fodder. This paper discusses the basic agronomic management especially irrigation frequency. Water stress affects photosynthesis directly and indirectly and consequently dry matter production and its allocation to various plant organs. Water use efficiency is the production of moles of carbon gained in photosynthesis in exchange for water used in transpiration. Water use efficiency is an important trait for improving drought tolerance in fodder. Keeping this in view, the present study was taken up with the following objective of evaluating the irrigation frequency of CN hybrid grass with respect to growth, yield under irrigated field condition during the lean dry months at north eastern zone of Tamil Nadu.

Materials and Methods

The field experiment was conducted at Post Graduate Research Institute in Animal Sciences, Kattupakkam, Kancheepuram District, Tamil Nadu, India during Feb.to June of 2017-18 to study the irrigation frequency for CN hybrid grass and asses the growth and yield of Cumbu Napier Hybrid grass variety CO-4. The experiment was laid out with Randomised Block Design with three replications. The treatment consist of different irrigation frequency such as daily irrigation (T1) alternate day irrigation (T2)once in two days (T3), once in four days (T4), once in six days (T5) once in eight days (T6)once in ten days (T7), once in twelve days (T8), once in fourteen days (T9) were compared.

The soil of the experimental field was clay loam. Fresh planting materials were used for

planting. Planting was done with the spacing of 50 x 50 cm. Crop package of practices were followed as per the crop production guide. Observations on growth and yield characters were recorded during crop growth stages. The data collected were subjected to statistical analysis in Randomized Complete Block Design following the method of Gomez and Gomez (2010). Wherever the treatment difference were found significant (F test), critical difference were worked out at five per cent probability level and the values were furnished. If there are no significant difference between treatments, it was denoted by the symbol NS.

Results and Discussion

Plant growth characters such as plant height, number of tillers /hill, tiller weight (gm) and girth of the tiller and green fodder yield (t/ha/cutting) is influenced by different irrigation frequency. The maximum plant height of (147.5 cm) was observed in six days of irrigation frequency. The number of tillers per hill and tiller weight was also higher in the same treatment of six days of irrigation frequency. Higher number of tillers of 17/hill and girth of tiller weight of 2.8cm were recorded in six days of irrigation frequency and it was comparable with four days of irrigation frequency. The tiller weight was higher (240 gram) in same treatment of six days of irrigation frequency. There is no significant variation in six and four days of irrigation frequency in tiller weight. The green fodder yield was also higher in six days of irrigation frequency and it was comparable with four days of irrigation frequency (Table 1).

Maximum plant height is obtained due to better early establishment by application of water at right time. Number of tillers and tillers girth was higher. It might be due to better establishment in the field and started growing at a faster rate. Higher plant height

might be one of the reasons for higher number of tillers and stem girth. Anitha *et al.*, (2018) reported that application of water at right time would increase the plant height, tiller numbers and tiller weight and there by yield. The increase in the green fodder yield of correct time of application of irrigation water would increase the root volume, strong tillers with higher tiller weight Hence it increased the yield of the crop. Correct time of application of irrigation water helps to maintain optimum plant population and geometry led to availability of more resources to the plants that resulted in increased plant height, tiller weight and yield of fodder. The same results were obtained in paddy by way of

maintaining optimum plant population and geometry, higher yields were recorded (Thakur *et al.*, 2010).

Twelve and fourteen days of irrigation frequency create water stress thereby influenced the growth and yield parameters like plant height, number of tillers and tiller weight negatively. Due to reduced growth and yield attributing characters the yield of the crop is reduced considerably. The same results were obtained by Sepideh Jafarian *et.al* (2016). They reported that yield attributing characters is highly influenced due to water stress and water stress reduced the yield significantly.

Table.1 Effect of Different Irrigation Frequency on Crop Growth and Yield Parameters of Cumbu Napier Hybrid grass

Treatments	Plant height (cm)	Number of tillers	Girth of tiller (cm)	Weight of tillers (gram)	Yield (tonnes /ha)
T1- Daily irrigation	137.2	11.3	2.1	192.3	93.4
T2- Alternate day irrigation	145.2	15	2.2	200.7	96.4
T3- Once in two days (T3),	146.1	16.7	2.3	207.7	102.2
T4- Once in four days	146.1	16.7	2.6	235	123.1
T5- Once in six days	147.5	17	2.8	240.0	125.7
T6- Once in eight days	132.6	9.3	1.8	180.0	88.8
T7- Once in ten days	129.1	9.0	1.5	167.3	80.6
T8- Once in twelve days	119.6	8.3	1.2	159.1	75.5
T9- Once in fourteen days	109.6	7.3	1.0	140.0	68.3
Critical difference (CD)	1.15	1.14	0.2	15.7	4.14
SEd(5%)	0.545	0.54	0.09	7.4	1.95

From the above study it can be concluded that higher green fodder yield and growth parameters were obtained with six days of irrigation frequency and it was comparable with four days of irrigation frequency in Cumbu Napier Hybrid grass variety of Co4. Among the different irrigation frequency, irrigation, once in four days and irrigation, once in six days significantly increased the growth and yield characters, cutting frequency and number of cuttings and yield of Cumbu Napier Hybrid Grass. These two treatments were comparable with each other. The maximum plant height, number of tillers hill⁻¹, Fodder yield were higher in these treatments. The fodder yield was lower in fourteen days of irrigation and twelve days of irrigation due to water stress.

References

- Gomez, K.A. and A.A. Gomez. 2010. Statistical procedures for Agricultural Research. Wiley India Pvt. Ltd., New Delhi, India.
- IGFRI, 2011. Vision-2030, Indain Grassland and Forage Research Institute, Jhansi
- S.S. Kadam, Ashok Kumar and Mohd. Arif, 2017. Hybrid Napier for Round the Year Quality Fodder Supply to the Dairy Industry- A Review. *Int.J.Curr.Microbiol.App.Sci* (2017) 6(10): 4778-4783.
- Sepideh Jafarian, Mohammad Reza Chaichi, Mehrdad Moradi-ghahderijani.2016. Effects of surfactant and limited irrigation on forage yield and quality of alfalfa(*Medicago sativa* L.). Australian Journal of crop science 10(1):76-80.
- Suganthi,M., Elango, A and Selvan, S.T. 2019. Effect of Different establishment Technique on yield of Cumbu Napier Hybrid Grass in North eastern zones of Tamil Nadu. Vol. Viii, Issue Xxviii, Jan 2019 Multilogic In Science ISSN 2277-7601.
- Thakur, A.K., Uphoff N and Antony. E. (2010). An assessment of physiological effects of System of Rice Intensification (SRI) practices compared with recommended rice cultivation practices in India. *Expl. Agric.* 46(1):77–98.

How to cite this article:

Suganthi, M., A. Elango and Selvan, S.T. 2019. Influence of Different Date of Irrigation on Growth and Yield of Cumbu Napier Hybrid Grass. *Int.J.Curr.Microbiol.App.Sci*. 8(08): 2944-2947. doi: <https://doi.org/10.20546/ijcmas.2019.808.338>