RESPONSE OF FORAGE YIELD OF PEARL MILLET TO CUTTING HEIGHT AND NITROGEN APPLICATION

By

MOSTAFA GAMAL AL-DIN IBRAHIM SOLIMAN

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This thesis for M.Sc. degree has been approved by:

Dr. Ahmed Ahd Mohamed El- Houssini .....

Prof. of Plant Ecology and Range Management, Range Management Unit, Desert Research Center

Dr. Mohamed Shokry Reiad .....

Prof. Emeritus of Agronomy, Faculty of Agriculture, Ain Shams University

Dr. Ramadan Thabet Abdrabou .....

Prof. Emeritus of Agronomy, Faculty of Agriculture, Ain Shams University

Date of Examination: / /2013

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Under the supervision of:

Dr. Ramadan Thabet Abdrabou

Prof. Emeritus of Agronomy, Department of Agronomy, Faculty of Agriculture, Ain Shams University (Principal Supervisor)

Dr. Wasfy Ramadan Abdelmomen

Assistant Prof. of Agronomy, Department of Agronomy, Faculty of Agriculture, Ain Shams University

Dr. Maha Metwally Hamada

Assistant Prof. of Agronomy, Department of Agronomy, Faculty of Agriculture, Ain Shams University

ABSTRACT

Mostafa Gamal AL-Din Ibrahim: Response of Forage Yield of Pearl Millet to Cutting Height and Nitrogen Application. Unpublished M.Sc. Thesis. Agronomy Department, Faculty of Agriculture, Ain Shams University, 2013.

To investigate the nitrogen fertilization rates, cutting height and their interaction effects on pearl millet, two field experiments were conducted in the summer seasons of 2009 and 2010 in the Experimental Station, Faculty of Agriculture, Ain Shams University at Shalakan, Kalubia Governorate. The experimental design used was a split plot design with 4 replications. Main plots were occupied by the nitrogen fertilization rates (0, 30, 45 and 60 Kg N/fed.) and treatment 75 Kg N/fed. added in the 2010 season, while the two cutting heights treatments (10 and 20 cm above the soil surface) were distributes randomly in sub-plots.

Results showed that increasing nitrogen fertilization rates from zero up to 75 Kg N/fed. caused significant increases in the studied growth attributes and yield i.e. plant height, number of tillers/m^2, number of leaves/m^2, leaf area index (LAI), forage green yield/fed and dry yield/fed, as well as some chemical content for as crude protein percentage and crude fiber percentage in leaves and stem while total carbohydrate percentage and ash percentage in leaves and stem were decreased.

Results of cutting heights indicated that plant height, number of leaves/m^2, leaf area index (LAI) and leaf/stem ratio were decreased with increasing cutting height from 10 to 20 cm, while number of tillers/m^2, forage green and dry yields/fed were increased by increasing cutting height. Generally cutting heights had insignificant effect on chemical composition.

Interaction between nitrogen fertilization rates and cutting height was insignificant on plant height, number of tillers/m^2, number of leaves/m^2, leaf

area index, leaf/stem ratio and chemical composition but green and dry forage yield/fed were significant where adding 60-75 kg N/fed. and cutting height at 20 cm above the soil surface gave the highest yield.

Key words: Pearl millet, *Pennisetum glaucum*, Nitrogen fertilization, Cutting height, Green forage yield, Dry forage yield, Chemical composition

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CONTENTS

LIST OF TABLES

INTRODACTION

One of the most important problems for animal production in Egypt is the reduction of forage crops productivity during the summer season. So, increasing forage crop productivity per unit area during the summer season or/and increasing the cultivated area of summer forage crops especially in the reclaimed lands become the back bone to solve this problem. Pearl millet is a summer forage crop which it can cultivate in the newly reclaimed lands to over-come that problem. To increase the forage production of pearl millet, it depends on many factors as cultivar, mineral nutrition, soil fertility, sowing data, cutting height…. etc.

Increasing nitrogen fertilization rates caused significant effect in many growth attributes of pearl millet as well as forage yield production such as plant height at the rate of 80 Kg N/ha (**El-tilib *et al.*, 2006**), 90 Kg N/fed. (**El- Houssini and Nassar, 1998**, **Manohar *et al.*1992**, **Lakhana *et al.*2005**); 100 Kg N/ha, (**Puri and Tiwana, 2005**) and 180 Kg N/ha (**Ayub *et al.*, 2009**) and (**Pathan *et al.*, 2010**), number of tillers at 80 Kg N/ha (**Verna *et al.*, 2006**); 90 Kg N/ha (**Lakhana *et al.*, 2005 and Pathan and Bhilare, 2009)**, 100 Kg N/ha (**Pathan *et al.*, 2010**), 180 Kg N/ha (**Mesquita and Pinto, 2000**) and 470 Kg N/ha (**Jinxing *et al.*, 1998**), number of leaves at rates of 90 Kg N/fed. (**El- Houssini and Nasser, 1998**), 100-180 Kg N/ha (**Puri and Tiwana, 2005, Ayub *et al.*, 2007 and Ayub *et al.*, 2009**), at rate of 80 Kg N/ha (**Bacci *et al.*, 1999** and **Kathju *et al.*, 2001**); 90 Kg N/ha (**Lakhana *et al.*, 2005 and El-tilib *et al.*, 2006**), 180 Kg N/ha (**Ayub *et al.*, 2009**) and 300 Kg N/ha (**Myandoab *et al.*, 2011**), leaf / stem ratio of fodder maize at rate of 90 Kg N/fed. (**Hassan *et al.*, 2008**), 135 Kg/ha (**Habib *et al.*, 2007**) and 300 Kg N/ha (**Piri and Tavassoli, 2012**).

Forage yield as green forage yield of pearl millet at rates 120 Kg N/fed. (**Mousa, 1991**), 90-100 Kg N/ha (**Sharma *et al.*, 1999; Manohar *et al.*, 1992; Tiwana *et al.*, 2003**) and 180 Kg/ha (**Ayub *et al.*, 2009**), dry matter yield at the rate of 90 Kg N/fed. (**El-Houssini and Nassar, 1998**); 90-120 Kg N/ha (**Tiwana *et al.*, 2003, Lakhana *et al.*, 2005, Puri and Tiwana 2005, Hegde *et al.*, 2006 and Bhilare *et al.*, 2010**) and 180 Kg N/ha (**Ayub *et al.*, 2009**).