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Response of Sudangrass (*Sorghum vulgare var. sudanense* L.) crop to planting dates and NPK fertilizer levels

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Abstract

A field experiment was conducted at the Agricultural Research Station - Karma Ali site - College of Agriculture - University of Basra / during the summer agricultural season 2024. With the aim of knowing the best planting date in the southern region and determining the best fertilizer level of the compound fertilizer NPK (equivalent 20:20:20) for the Sudan grass crop. The experiment was conducted in a split-plot design using a randomized complete block design (R.C.B.D) with three replicates. The main plots contained NPK levels (0, 200, 400 and 600 kg ha-1) and were symbolized by the symbols F0, F1, F2 and F3 respectively, while the sub-plots occupied three planting dates: March 1, March 15 and April 1. Fertilizer was added after 20 days of planting in the form of NPK and nitrogen fertilizer batches were completed after each mowing in the form of urea fertilizer (46%N). Three mowings were taken during the crop growth period. Plant height, number of branches, number of leaves, stem diameter, specific leaf weight, chlorophyll percentage, green and dry forage yield were measured for all three mowings. The results showed that the difference in fertilization levels had a significant effect on most of the studied traits, F2 level recorded the highest green fodder yield, reaching 24.740 µg ha^{-1}, without a significant difference from the F3 level (24.370 megagrams ha-1) for the first harvest, while the F3 level was superior and gave the highest average green fodder yield, reaching 44.880 and 20.230 µg ha^{-1} for the second and third harvests, respectively. The dates had a significant effect on most of the studied traits. The second date recorded the best green fodder yield of 26.720 µg ha^{-1} 33 in the first cut, while the first date D1 gave the highest average for the trait for the second and third cuts, reaching 32.160 and 12.840 µg ha^{-1}. The second date recorded the highest average for dry fodder yield of 8.900 µg ha^{-1} for the first cut, and the first date outperformed, recording the highest average of 10.970 and 4.650 µg ha^{-1}, respectively, for the second and third cuts of dry fodder yield.

Key words: Sudan grass, NPK fertilizer, planting date.

I. INTRODUCTION

Sudan grass (*Sorghum vulgare var. sudanense* L.) is a forage sorghum species, and has a similar plant composition to it, but it has more shoots and stems compared to forage sorghum (Casler, 2003). In addition, it has a high ability to grow quickly after mowing, which makes it more suitable for grazing and hay production (Mohammed, 2010). Hybrids are usually the result of crosses between female forage sorghum and male Sudangrass. These hybrids show higher biological productivity than Sudangrass due to their ability to produce a larger number of branch. They also have faster growth compared to forage sorghum, but less than Sudangrass (Venuto, 2008). Sudan grass is native to East Africa and grows in subtropical and tropical regions, and is also cultivated in South Asia, South America and Southern Europe. It is preferred over other summer forage crops because it is palatable, nutritious and less toxic with peruic acid (HCN). In addition, it produces large quantities of fodder compared to other sorghum fodders. The crop is also used as green fodder or silage, and because the crop is a C4 plant with high efficiency in utilizing solar energy, which made the crop have a high production of dry matter and give a high green and dry fodder yield (Bunila, 2018). The amount of fodder produced from it and the date of its availability depend