Effect Of INM On Seed And Green Fodder Production In Berseem (*Trifolium Alexandrium)* At Various Cutting Stages

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ABSTRACT:
In winter 2016–17, an experiment was carried out on Berseem (cv. Mescavi). Twelve treatments were tested in a Randomized Block Design with three replications: T1 (control), T2 (100% RDF, 20 kg N + 80 kg P2O5 ha-1), T3 (100% N through Farm Yard Manure (FYM), T4 (100% N through Poultry Manure), T5 (50% RDF +50% N through FYM), T6 (50% RDF +50% N through Poultry Manure), T7 (50% N through FYM+50% N through Poultry Manure), T8 (50% RDF +25%N through FYM +25% N through Poultry Manure), T9 (75% RDF +25% N through FYM), T10 (75% RDF +25% N through Poultry Manure), T11 (25% RDF +75% N through FYM), and T12 (25% RDF +75% N through Poultry Manure. The results showed that applying 100% RDF (20 kg N + 80 kg P2O5 ha-1) and fallowing 75% RDF + 25% N through poultry manure and 75% RDF + 25% N through FYM resulted in the highest plant height, fresh weight of leaf and stem, dry weight of leaf and stem, shoot: root ratio plant-1, and number of nodules plant-1.

INTRODUCTION:
In 1903, berseem was brought to India (**Roy et al., 2009)**. Beseem Trifoliumalexandrinum L. belongs to one of the largest and most valuable plant groups, the Leguminosae. The genus Trifolium contains 242 species; 16 of these are cultivated and are all used as fodder crops (**Zohary and Heller, 1984**). With an area of about 2 M ha, it is the greatest fodder crop in India and the maximum area among fodder legumes, second only to fodder sorghum (2.5 M ha).On a dry matter basis, the berseem green forage comprises 17–22% crude protein (CP), 42–49% neutral detergent fiber (NDF), 35–38% acid detergent fiber (ADF), 24–25% cellulose, and 7–10% hemi-cellulose. Crop growth is accelerated at temperatures between 18 and 21 ºC. The winter frost period inhibits crop growth. A winter temperature of 6–8 ºC has a significant impact on crop growth.According to **Choudhary et al. (2014),** the nation currently has a net deficit of 63% in green feed, 24% in dry crop leftovers, and 64% in feeds. Because poultry manure has a high organic matter content together with readily available nutrients for plant growth, it is an effective soil supplement that not only offers nutrients for growing crops but also, when widely applied, improves soil quality (**Ryssen et al., 1993**).
Both macro- and micronutrient deficiencies are occurring in the soils as a result of the intense cropping strategy. Biofertilizer has shown to be a useful part of System for Integrated Nutrient Management. This takes on extra importance, especially when it comes to multi-cut fodder species that need periodic important nutrient supplements **(Harendra Kumar et al., 2007).** Thus, the goal of the current study was to determine how INM affected the vegetative and reproductive performance of berseem fodder crop by employing chemical fertilizers and biofertilizers such as FYM, Rhizobium, PSB, and Azospirillium.

METHODS AND MATERIALS
Wintertime was when the experiment was carried out. 2016–17 at Narendra Deva's Agronomy Research Farm Kumarganj University of Agriculture & Technology, Faizabad (U.P), which is located 42 km distant from Faizabad. The experimental site is in a humid subtropical climate. climate and situated at latitudes 26.470 N and longitude 82.120 E. longitudes at a height of roughly 113 meters above mean sea level level in Eastern Uttar Pradesh's indo-gangetic alluvial soil belt Pradesh. The average amount of precipitation in this area per year roughly 1200 mm. This region receives its maximum amount of rainfall mid-June through the end of September. However, occasional January is a month when showers are frequent and February. While summer is hot, winter is frigid. months are hot and humid with local hot conditions from the west. The various weather parameter components, such as the maximum and minimum temperatures, the distribution of rainfall, the relative humidity, and the number of hours of sunlight, are recorded. the crop cycle, which runs from October 2016 to April 2017, have been illustrated visually in Fig. 1. The lowest temperature (4.90C) and highest temperature (390C) of the crop season were recorded in January and April, respectively. Over the

course of the crop season, 7.57 mm of rainfall were received. January had the greatest mean relative humidity (88.20%) of any month. It was discovered that the sun's shining hours ranged from 1.0 to 9.1 hours.
The experimental field's soil was identified as silty loam with an alkaline reaction pH of 8.1, low in organic carbon (0.34%), medium in potassium (240.1 kg ha-1), and high in accessible nitrogen (185.4 kg ha-1) and phosphorus (16.5 kg ha-1). A thorough preparation of the land was done to achieve fine soil texture, and the field received pre-sowing irrigation around 15 days before the experimental crop was sown. To remove weeds and crop stubbles from the field, a tractor-drawn soil turning plough was used for the initial plowing. Following three to four days, a tractor-drawn cultivator made two deep ploughings, which were followed by harrowing. Every ploughing was always followed by planking. The field was leveled appropriately to allow for efficient irrigation water distribution, and it was clear of weeds and clods.
According to the treatments, well-rotten FYM was used before deep plowing. The nitrogen content was used to calculate the amount of FYM. In accordance with the procedures, poultry manure was applied prior to deep ploughing. The nitrogen content was taken into account when calculating the amount of poultry manure. When it comes to fertilizers, phosphorus and nitrogen were added as SSP and urea. When seeding, the entire recommended dosage of phosphate and nitrogen was administered, with a beginning dose of nitrogen supplied to berseem crops. After being treated with 250 g kg-1 Rhizobium trifolium seed and 150 g kg-1 jiggery seed, the seeds are dissolved in 1 to 1.5 liters of water and then evenly distributed over the seeds before being dried in a shed for 10 to 15 minutes. The date of sowing the seeds was November 2, 2016.Broadcasting was used to sow the seeds at a depth of 3–4 cm. In each plot, a certified seed of the cultivar Mescavi was utilized at a rate of 30 kg ha-1.

FINDING AND DISCUSSION:
The application of 100% RDF (20 kg N + 80 kg P2O5 ha-1) resulted in the highest plant height and fresh weight of leaf at different cutting stages. This was statistically comparable to the application of 75% RDF +25% N through poultry manure, 75% RDF +25% N through FYM, and 50% RDF +50% N through poultry manure, respectively. However, this was significantly higher than the other treatments. This could be because the growing plants utilized more available nitrogen and phosphorus during the whole grand growth period because there was more time available for regenerated crop. Valiki et al. (2015). Integrated nutrient management had a major impact on the fresh weight of the stem and the dry weight of the leaf at the first, second, third, and fourth cuts. When 100% RDF (20 kg N + 80 kg P2O5 ha-1) was applied, the largest fresh weight of the stem was observed in comparison to the other treatments. This could be because the use of chemical fertilizers to feed nutrients causes plants to absorb the nutrients directly in soluble form, increasing the amount of chlorophyll in the leaves and, consequently, the fresh weight of the plant. The control treatment yielded the smallest fresh weight of stem. The deficiency of nutrients in the soil could be the cause of this. Similar outcomes were also attained by Shahrajabian and Soleymani (2012).
The dry weight of the stem under different treatments was greatly impacted by integrated nutrient management. The highest dry weight of the stem at the first, second, third, and fourth cuts with T2 -100% RDF (20 kg N + 80 kg P2O5) in comparison to other treatments at all cutting stages. Due to a higher nutrient supply brought about by the largest production of dry weight of stem, it may be a favorable synthesis of growth-favoring ingredient in the plant system Subrata and Chakraborthy (1998).The shoot-to-root ratio was shown to be significant at the first and fourth cuts, but not significantly changed by different treatments at the second and third cuts. In comparison to other treatments, the greatest shoot to root ratio at the Ist and IVth cuts with 100% RDF (20 kg N + 80 kg P2O5 ha-1).
According to Jan et al. (2014) and Roy et al. (2015), at the second and third cuts, the plant's shoot and root both gradually grew at the same ratio, meaning that different treatments had no discernible effect on the shoot to root ratio. However, at the fourth cut, the amount of available nutrients did not cause the shoot mass to increase further. The greatest number of nodules on a plant was discovered treatment (75% RDF + 25% N through FYM, then 75% RDF + 25% N through Poultry Manure). Kumar et al. (2007) obtained a similar finding. It could be because organic manure applications create ideal conditions for berseem nodulation. Taneja et al. (1994) also reported that the control treatment at different cutting stages of the berseem crop yielded the least number of nodules per plant.

CONCLUSION:
Berseem responded better to integrated nutrient management practices in terms of both forage and seed yields. Non-availability of seed is also one of the major constraints for expanding the area under fodder crop production. The present study indicates the potential of INM in finding a sustainable solution to the fodder and seed yield issues.

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