Original Research Article

PERFORMANCE OF VARIETIES UNDER DIFFERENT NITROGEN FERTILIZER LEVELS

ABSTRACT

Aims: To evaluate/ identify the yield potential of different pre released rice genotypes at different Nitrogen levels under Northern Telangana Zone
Study design: Split plot design
Place and Duration of Study: RARS, Jagtial, Kharif 2018-19 to Rabi 2019-20
Methodology: Four pre released cultures of northern telagana zone viz., C1-KNM-733, C2-KNM-1638, C3- JGL 24423 and C4: JGL-H-1 along with one check variety C5- MTU-1010 were evaluated as factor-1 and neem coated nitrogen levels four were tested as factor -2 and Dhaincha as green manure is incorporated during pre kharif season 2018. Based on two seasons data, 100% RDN:100-120 kg N ha^{-1} is enough with respect varieties KNM 1638 during *Kharif* 2018 and JGL-24423 during *Rabi* 2018-19 with 100% RDN-120-150 kg ha^{-1}. Application of 100% RDN (neem coated urea) was on par with 90% RDN with neem coated urea were recorded highest yields with respect to varieties KNM 1638 during *Kharif* and Jgl-24423 during *Rabi.*

Results: The highest yield was recorded in with respect to varieties KNM 1638 (9341kg/ha) followed JGL24423 (9927kg/ha) compare to check (9,341 kg/ha) during *kharif* season. Among the nitrogen levels 100% RDN recorded highest yield (10328 kg / ha) and increasing dose resulted in decreasing yield. But Cost benefit ratio was also highest recorded in JGL-24423(1:37) followed by KNM 1638 (1:31) during kharif season. In Rabi The highest yield was recorded in pre released cultures JGL 24423 (5802kg/ha) followed by KNM 733 (5731kg/ha) compare to CHECK (4651 kg/ha) and with respect to the nitrogen levels 100% RDN recorded highest yield @5231 kg /ha was on par to 90%RDN @ 4774 kg ha-1. B:c ratio maximum in JGL24423 WAS 1.37 AND KNM733 WAS 1.36 and among the nitrogen levels 100 RDN @ 1.32 AND 90%RDN @1.02

Conclusion: Based on two seasons data, 100% RDN-100-120 kg N ha -1 is enough with respect varieties KNM 1638 during Kharif 2018-19 and JGL-24423 during Rabi-18-19 with 100% RDN-120-150 kg ha -1 .

Keywords:Genotypes/cultivars, Nitrogen fertilizers, Green manure, Uptake, Economics

1. INTRODUCTION

Rice being the staple food of more than 60 per cent of the global population deserves top most priority in Agriculture. Identification and use of high yielding potential cultivars, though ensures higher yields, the actual yield advantage depends on the agronomic management including that of nitrogen management. Yield potential of a cultivar could be exploited to a maximum extent by judicious management of applied nitrogen. Identification of location specific cultivar and optimum nitrogen dose are essential for increasing the productivity of rice. Such information is lacking for the newly developed rice cultivars *viz*; JGL 24423, JGL H-1 and KNM 733 and KNM 1638 under Northern Telangana region during *Kharif* and *Rabi* seasons. Keeping these points in view, the present investigation was under taken with the following objectives to study the To identify the yield potential of different pre released rice genotypes at different Nitrogen levels under Northern Telangana Zone and to study on uptake and soil available Nitrogen and economics.Identification and use of high yielding potential cultivars, though ensures higher yields, the actual yield advantage depends on the agronomic management including that of nitrogen management. Identification of location specific cultivar and optimum nitrogen dose are essential for increasing the productivity of rice. Application of the appropriate level of nitrogen fertilizer is a major discussion with regards to economic viability of rice crop production.

2. MATERIAL AND METHODS / EXPERIMENTAL DETAILS / METHODOLOGY

A field experiment was conducted in a consequent two seasons (*Vanakalam* and *yasangi*) at Regional Agricultural Research Station, Polasa, Jagtial, Karimnagar, Telangana state during 2018 and 2018-2019. The treatments comprised of five varieties as main plots *viz*., C_1-KNM-733, C_2- KNM-1638,C_3- MTU 1010(Check),C_4- JGL 24423 and C_5: JGL-H-1 and Nitrogen levels as sub plots N_1-75 % RDN (90-120 kg N), N_2-100% RDN (120-150 kg N), N_3-125% RDN (155- 175 kg N), N_4-90% RDN (100-120 kg N). The treatments were laid out in Split plot design with three replications.

Dhaincha as green manure was grown and incorporated in situ during pre *Vanakalam* season before rice planting. Simultaneously paddy nursery was sown during *Vanakalam* on 23.06.18 and during *Yasangi* on 15.12.2018, respectively. Transplanted during *Vanakalam* on 23.07.18 and *Rabi* on 10.01.2019 as well as date of harvesting during *Kharif* on 26.10.2018 and *Rabi* 10.04.2019, respectively.

The recommended dose of fertilizers for paddy during *Kharif* is 120:60:40 kg NPK ha^{-1}, during *Rabi* is 150:60:40 kg NPK ha^{-1}, were applied through urea, single super phosphate and muriate of potash, respectively in rice crop.

3. RESULTS AND DISCUSSION

The results of the *Kharif* -2018 indicated that, among rice varieties KNM-1638 recorded significantly higher yield of 9951 kg ha^{-1} which was on par with JGL-24423 (9927 kg ha^{-1}), KNM-733 (9457 kg ha^{-1}). Lower yields were recorded in JGL-H-1 (9061 kg ha^{-1}). Among the N levels, significantly higher yields were recorded under 100% RDN (10328 kg ha^{-1}), followed by 125% RDN (9803 kg ha^{-1}), 90% RDN (9347 kg ha^{-1}) and 75% RDN (8661 kg ha^{-1}). Interaction between rice verities and N levels found to be non significant (Table 1).

The results of *Rabi*-2018-19 also followed the similar trend in both rice varieties and N levels as Kharif - 2018 (Table. 2). The variation in grain yield among different varieties was due to the differential efficiency of these varieties in converting dry matter in to grain. Similar findings were also reported regarding varietal performance under different nitrogen levels in rice by Priydarshini and Prasad (2003) and Srilaxmi *et al*. (2005).

Among the varieties higher yield was recorded with KNM 1638 (9341kg ha^{-1}) followed by JGL24423 (9927 kg ha^{-1}). Among the nitrogen levels 100% RDN recorded highest yield (10328 kg ha^{-1}) and increasing dose resulted in decreasing yield. Benefit to cost ratio was recorded higher in JGL-24423(1:37) followed by KNM 1638 (1:31) during *Kharif* season.

During *Rabi* higher yield was recorded in JGL 24423 (5802 kg ha^{-1}) followed by KNM 733 (5731 kg ha^{-1}). With respect to the nitrogen levels 100% RDN was recorded highest yield (5231 kg ha^{-1}) which was on par to 90% RDN (4774 kg ha^{-1}). Benefit to cost ratio was maximum in JGL24423 (1.37) followed by KNM733 (1.36) and among the nitrogen levels 100 RDN (1.32) followed by 90%RDN (1.02). Adequate nutrient availability might have resulted in enhanced amount of protoplasm and chlorophyll which play vital role in increased assimilation of photosynthesis, dry matter production, number of productive tillers which finally reflected in higher grain yields (Singh *et al*., 2000).

During *Rabi*, the response to higher nitrogen level was due to the favourable weather conditions (bright sunshine hours) coupled with improved nutrient availability due to minimal losses under controlled irrigation over *Kharif* season (Kavitha *et al*., 2009). The interaction effect of varieties and nitrogen levels on grain yield was found to be non-significant during both the seasons and years.

Among the varieties JGL 24423 has recorded higher N and K uptake in grain (85.75 kg ha^{-1} and 18.12 kg ha^{-1}, respectively), however KNM 733 has recorded higher P uptake in grain (16.01 kg ha^{-1}) (Fig 5). Among the N levels, 100% RDF has recorded higher N, P and K uptakes, followed by 125 % RDN, 90 %RDF and 75 % RDN (Fig 6).

During *kharif*, among the varieties JGL 24423 has recorded higher N and K uptake in grain (129.7 kg ha^{-1} and 27.71 kg ha^{-1}, respectively), however MTU 1010 has recorded higher P uptake in grain (25.67 kg ha^{-1}) (Fig 7). Among the N levels, 100% RDF has recorded higher N, P and K uptakes, followed by 125 % RDN, 90 % RDF and 75 % RDN (Fig 8).

Increased nitrogen application led to over growth of above ground biomass and consequently, increase of leaves and stems dry weight, caused decline in N concentration and uptake (Grzebisz, 2008).

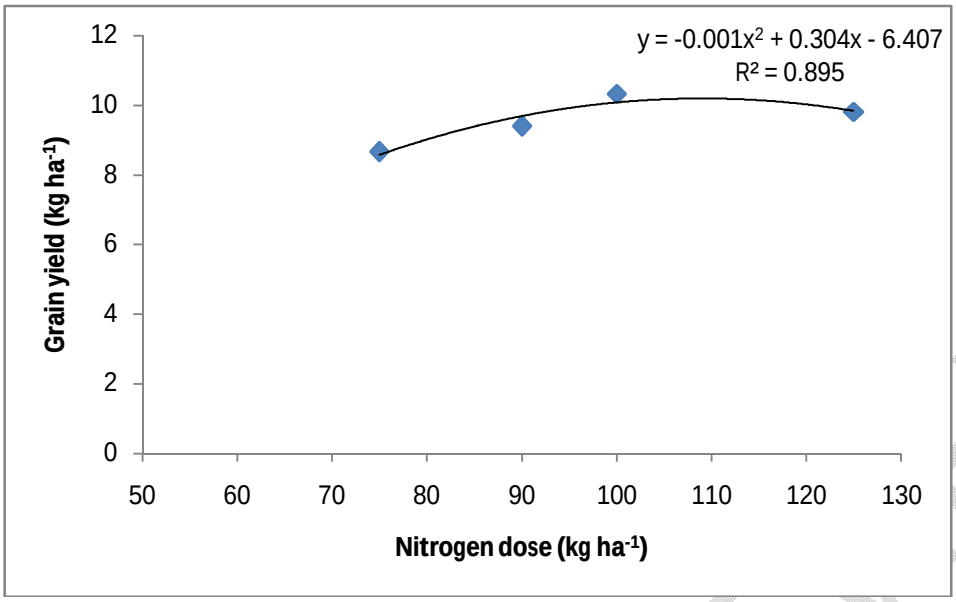

Fig 1: Influence of Nitrogen doses on grain yield of rice during *Kharif*,2018

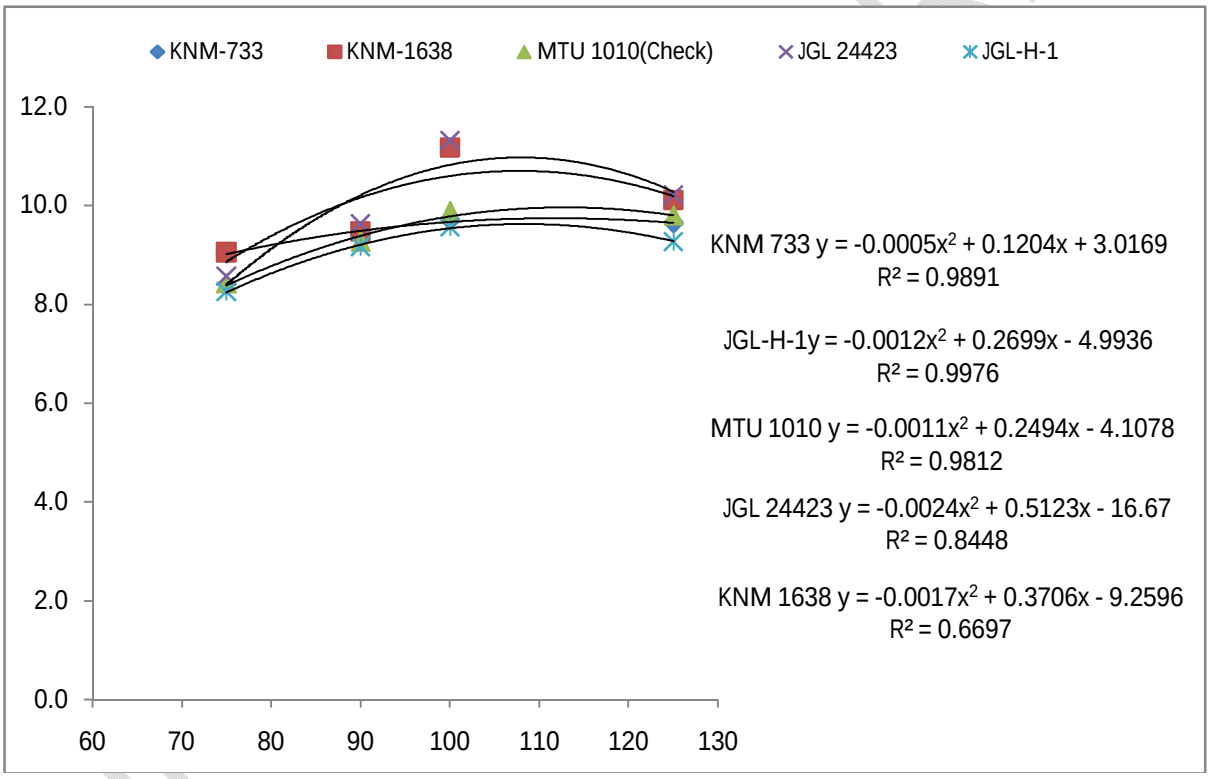

Fig 2: Interaction of Nitrogen doses on grain yield of rice during *Kharif,*2018

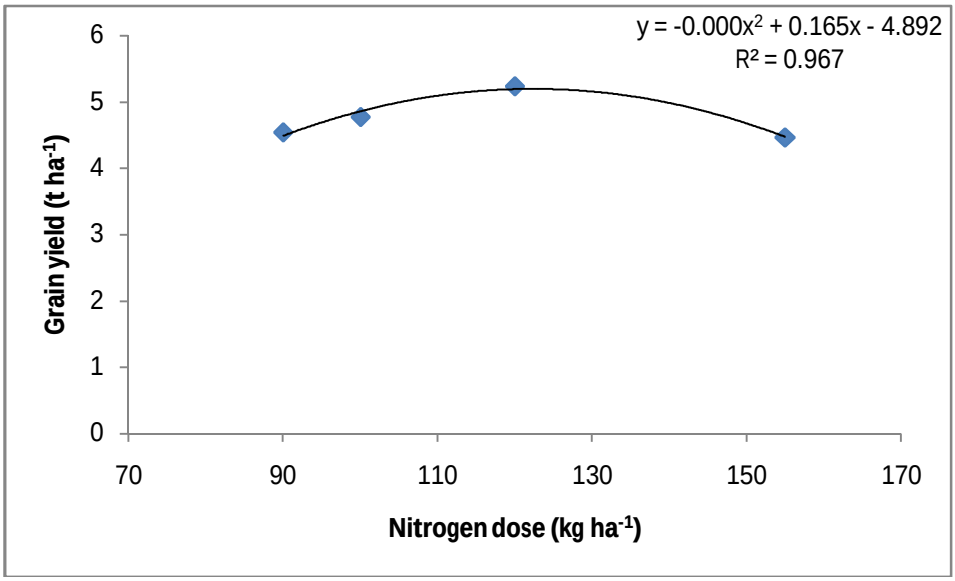

Fig 3: Influence of Nitrogen doses on grain yield of rice during *Rabi*,2019-20

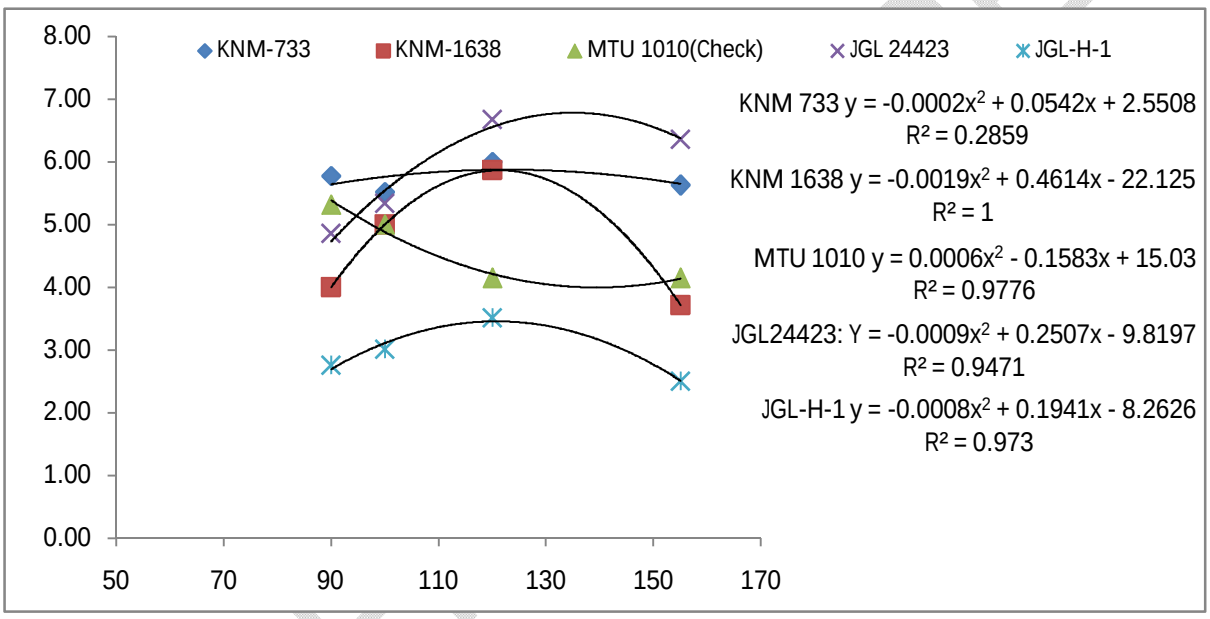

Fig 4: Interaction of Nitrogen doses on grain yield of rice during *Rabi*,2019-20

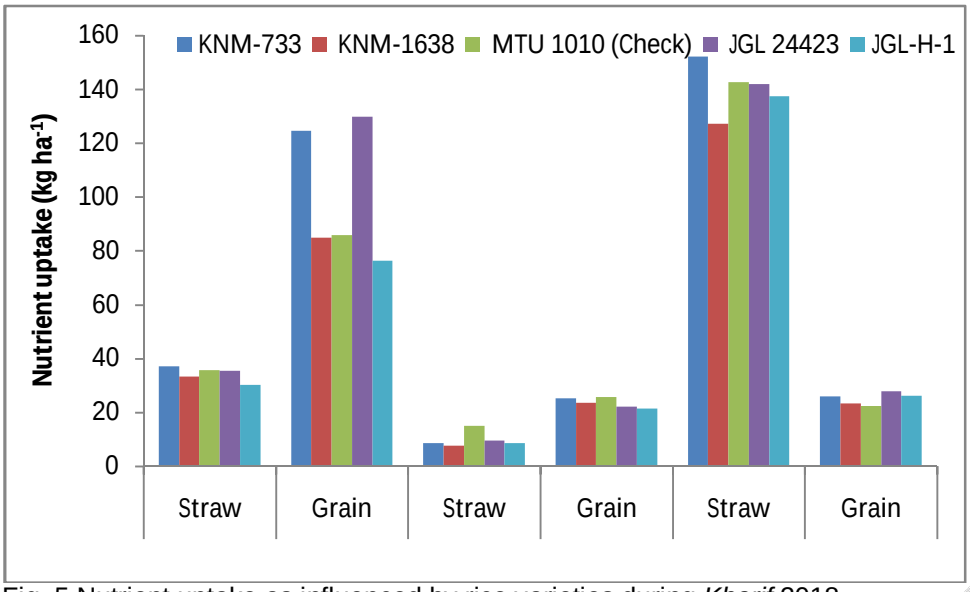

Fig. 5 Nutrient uptake as influenced by rice varieties during *Kharif*,2018

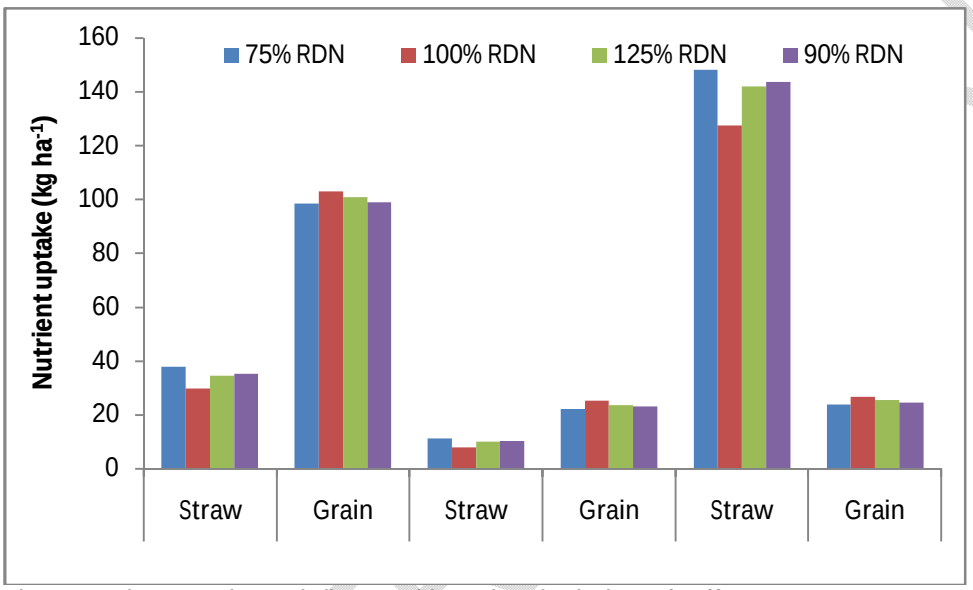

Fig. 6 Nutrient uptake as influenced by N levels during *Kharif*, 2018

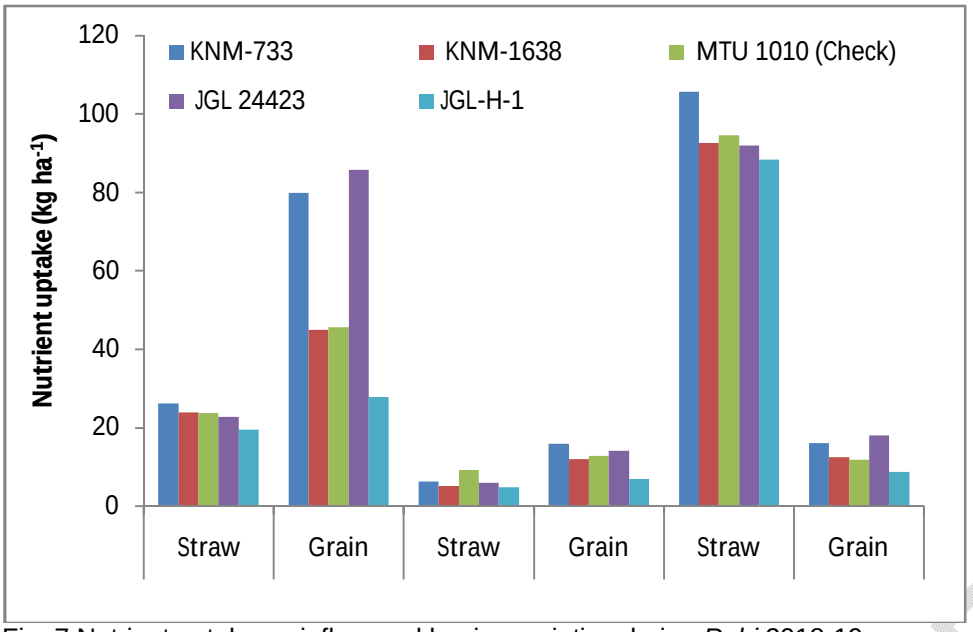

Fig. 7 Nutrient uptake as influenced by rice varieties during *Rabi*,2018-19

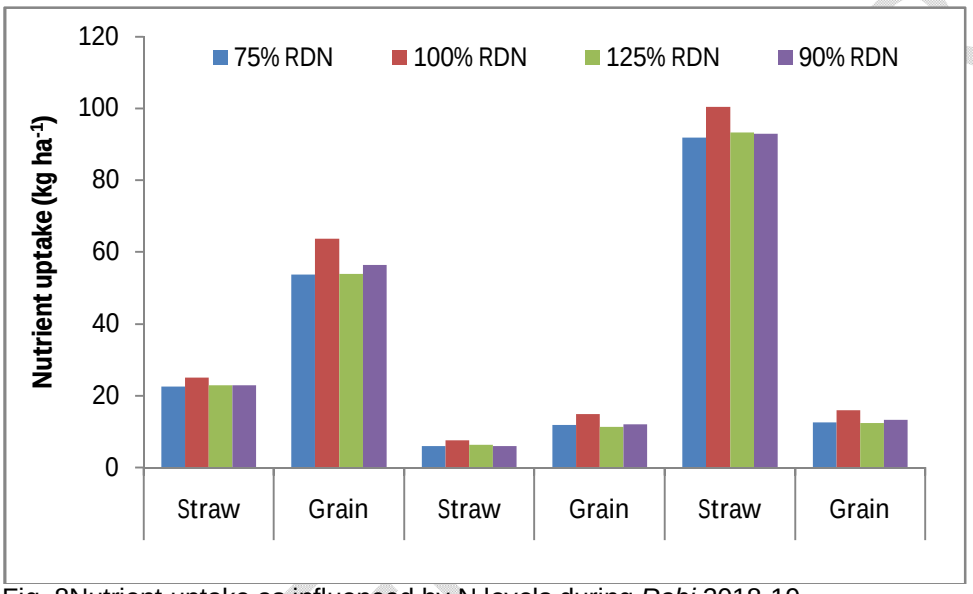

Fig. 8Nutrient uptake as influenced by N levels during *Rabi*,2018-19

4. CONCLUSION

The major findings of the study,revealed that based on two seasons data, 100% RDN: (100-120 kg N ha^{-1}) is enough with respect varieties KNM 1638 during *Kharif* 2018 and JGL-24423 during *Rabi* 2018-19 with 100% RDN (120-150 kg ha^{-1}). Application of 100% RDN (Neem coated urea) was on par with 90% RDN with neem coated urea were recorded highest yields with respect to the varieties KNM 1638 during *Kharif* and JGL-24423 during *Rabi*. Nitrogen and potassium uptake were recorded higher under JGL-24423 in both the seasons and P uptake was higher under KNM 733 during *Rabi* and MTU 1010 during *Kharif* .

CONSENT (WHERE EVER APPLICABLE)

No problem arise with other authors.

ETHICAL APPROVAL (WHERE EVER APPLICABLE)

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