**Research Article** **AJAR (2018), 3:22**

**American Journal of Agricultural Research (ISSN:2475-2002)**

# Response of Growth and Yield of Potato to Neb-26 as a Source of Nitrogen

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## ABSTRACT

This Urea is a vital source of nitrogen (N) to be supplied for plants but most of it is lost through processes including volatilization, denitrification, leaching and run-off. So, it is timely to find out an alternative source of nitrogen fertilizer. A field experiment was, therefore, carried out at Soil Science Field Laboratory of Bangladesh Agricultural University, Mymensingh during 2016-2017 with a view to investigating the effectiveness of NEB-26 (a liquid N fertilizer introduced by Advanced Chemical Industries (ACI) Limited) in combination with urea on the growth and yield of potato. The soil was silt loam in texture having a pH 6.4, organic matter 1.55%, total N 0.091%, available P 3.30 mg kg-1, available K 0.08 me 100-1 g soil, available S 6.46 mg kg-1 and available Zn 0.86 mg kg-1. The experiment consisted of five treatments laid out in a Randomized Complete Block Design with four replications. The treatments were T1: Control (no N fertilizer), T2: 100% N from urea, T3: 50% N from urea, T4: 50% N from urea + 500 ml ha-1 NEB-26 and T5: 50% N from urea + 750 ml ha-1 NEB-26. The potato variety used in the experiment was ‘Diamant’. The recommended doses of N (140 kg ha-1), P (25 kg ha-1), K (135 kg ha-1) and S (15 kg ha-1) were supplied from urea, TSP, MoP and gypsum, respectively. All the fertilizers except urea were applied as basal dose. Urea was applied in three installments and the NEB-26 was applied as per treatment at the time of second installment of urea application. The crop was harvested at maturity and the yield components and yields were recorded. The results indicate that the yield attributes, tuber yield and haulm yield of potato were significantly influenced by N supplied from urea and NEB-26. The tuber yield varied from 10.83 t ha-1 in T1 (Control) to 23.20 t ha-1 in T2 (100% N from urea). The maximum tuber yield (23.20 t ha-1) was recorded in T2 (100% N from urea) which was statistically similar to T4: 50% N from urea + 500 ml ha-1 NEB-26. Based on tuber yield, the treatments can be ranked in the order of T2 >T4 > T3 >T5 >T1. The N content and uptake by both potato tuber and haulm were also influenced significantly by N supplied from urea and NEB-26. From the overall results, it can be concluded that the NEB-26 can be used in combination with urea for potato production and the use of NEB-26 can reduce about 30% N without reducing potato tuber yield.

**Keywords:**

NEB-26, Nitrogen, Urea, Potato, Yield

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**How to cite this article:**

Sana Abusin. Natural resource modelling: accounting for gillnet size selectivity in dynamic deterrence model. American Journal of Agricultural Research, 2018,3:22.

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Website: http://escipub.com/

## Introduction

Potato *(Solanum tuberosum* L.) is classified as tuber crop which plays an important role on human feeding and weight, energy content and produced protein. Next to wheat, rice and maize, potato is the leading staple food crop in the world. Once, potato was considered as a crop of winter country. However, over last two decades Bangladesh has emerged as a leading potato producing country in the world and the total area under potato crop was estimated as 4,75,488 hectares in 2015-2016 and production was 94,74,098 metric tons with a hectare yield of 19.93 metric ton (BBS, 2017). Crop yield and quality mostly depends on the availability of nutrients in soil. Potato crop is a heavy feeder and hence needs ample supply of plant nutrients especially nitrogen for its proper growth and higher yield. Nitrogen (N) is a very dynamic plant nutrient. It is an essential element for plant growth and is a main part of proteins. Its uncontrolled application can considerably raise the price of agricultural production, and under increased application rates of N, insufficient utilization by plants may result in environmental pollution (Moreno *et al*., 2003). The appropriate rate of applied nitrogen fertilizers is a key factor in soil fertility management, as its over-usage can delay plant maturity and directs dry matter storage into aerial parts rather than tubers (Hashemidezfooli *et al*., 1998). Several N fertilization rates have been advised as optimal for potato production. In some European countries and the USA that have a potato growth cycle of 4–5 months, the recommended N fertilization rates vary from 70 to 330 kg $ha^{-1}$, and the most economically efficient rates from 147 to 201 kg $ha^{-1}$ (Fontes *et al.,* 2010).

Tuber nitrogen uptake and nitrate concentration are significantly influenced by nitrogen fertilizer. Nitrogen uptake also increases the number of tuber, tuber weight, qualitative and quantitative aspects of tuber (Hasse *et al*., 2007). So, to get higher yield, farmers apply surplus amount of urea which increases their cost of production. Besides, Bangladesh, as a developing country do not have enough resources to produce the needed amount of urea which compels the government to import. Keeping all these circumstances in mind, Advanced Chemical Industries (ACI) has recently introduced a new generation fertilizer in Bangladesh namely NEB-26 developed by an American Company.

NEB-26 is a liquid fertilizer containing N in aromatic form derived from Fulvic acid (17%). It is non-toxic and environment friendly. NEB-26 is plant energizer and yield booster. It can be easily applied on the field with other fertilizers. It enhances the quality of soil by increasing the number of beneficial micro-organisms present in the Rhizosphere which collects nitrogen from atmosphere and fix in the root zone and thereby can save 50% urea use. It provides better anchorage of plants and improves the nutrient uptake and nutrient use efficiency of the pants. To investigate the efficacy of NEB-26, field trial on potato cultivation was conducted by BARI at Munshigonj in 2017. The results found from the trial was excellent. There was a yield of about 32.10 t $ha^{-1}$ produced from NEB-26 applied field which was slightly higher from the field which was given only urea (The Amader Orthonity, 2017). As NEB-26 is very new in Bangladesh, there is a lack of researches on the effect of NEB-26 as N fertilizer on the growth and yield of potato. Therefore, the present study was undertaken with a view to evaluating the effects of NEB-26 in combination with Urea-N on the growth and yield of potato and finding out the suitability of NEB-26 for use as N fertilizer.

## Materials and Methods

### Experimental site and soil

The field experiment was carried out at Soil Science Field Laboratory of Bangladesh Agricultural University, Mymensingh during November 2016 to February 2017. The experimental site is located at 24.75°N altitude and 90.50°E longitude at a height of 18m above sea level and belongs to the AEZ 9 (Old Brahmaputra Floodplain). The initial soil properties of the experimental site has been depicted in Table 1. The main characteristics of the climate of the experimental area are inadequate rainfall associated with moderately low temperature during Kharif-1 season (16 October 2016 – 15 March 2017).

### Treatments

The experiment consisted of 5 treatments including $T_1$ = Control (no N fertilizer), $T_2$ = 100% of recommended N from urea, $T_3$ = 50% N from urea, $T_4$ = 50% N from urea + 500 ml $ha^{-1}$ NEB-26 and $T_5$ = 50% N from urea + 750 ml $ha^{-1}$ NEB -26.

### Lay out of the experiment

The experiment was laid out in a randomized complete block design (RCBD), where the experimental site was divided into 4 blocks representing the replications to reduce the heterogenic effects of soil. There were altogether 5 treatment combinations. A total of 20 plots were prepared for the experiment and the treatments were distributed to the unit plots in each block. The size of each plot was 5m × 4m. The space between two adjacent unit plots and blocks were 60 cm and 1 m, respectively.

### Land preparation

The land of the experimental unit was prepared in the $2^{nd}$ week of November, 2016. It was done by repeated ploughing with a power tiller. All the weeds and crop residues of the previous crop were collected and removed from the field. After leveling, the experimental unit was laid out as per treatments and design.

### Fertilizer application

The N, P, K and S were supplied from urea, TSP, MoP and gypsum, respectively. The recommended doses of N, P, K and S were 140, 25, 135 and 15 kg $ha^{-1}$, respectively. All the fertilizers except urea were applied as basal dose. Urea was applied in three splits. Half of urea and the recommended doses of other fertilizers were applied during the final land preparation. The remaining half of urea was divided into two and applied as top dressing after 30 days after planting (DAP) and 50 DAP, respectively. The NEB-26 was applied as per treatment at the time of second installment of urea application.

### Transplanting of seedlings

The seed tubers were planted in furrows on 11 November 2016 maintaining a spacing of 60 cm x 40 cm. Thus, each unit plot accommodated 30 seed tubers in 8 rows. The depth of planting was 10 cm from the surface of the soil.

### Intercultural operations

Irrigation and weeding were done as per requirement to provide and maintain the favorable condition for normal growth and development of crop. Earthing up was done 3 times during the growing period. The experimental plots were infested with some obnoxious weeds, which were controlled by uprooting and removing as many as three times from the field. Dithane M-45 and Ridomil were sprayed several times to prevent fungus attack.

### Harvesting, Threshing and Weighing

The crop was harvested at maturity. At first five sample plants were harvested from each plot and then the whole plot was harvested with the help of spade. Proper care was taken to avoid injury of potatoes during harvesting.

### Data Collection

Data on yield components were recorded from 5 randomly selected sample plants from each plot. The plants in the outer two rows and at the extreme end of the middle rows were excluded during sample collection. Yield data were recorded plot wise to calculate the yield of potato in t $ha^{-1}$. Data were recorded on different parameters such as plant height, number of plants $hill^{-1}$, number of tubers $hill^{-1}$, weight of tubers $hill^{-1}$, gross yield of tubers $plot^{-1}$ and gross yield of haulm $plot^{-1}$.

### Determination of N from plant samples

Total N was determined by micro-Kjeldahl method where 1 g of oven dried ground sample was taken into micro-Kjeldahl flask to which 1.1 g catalyst mixture ($K_2SO_4$: $CuSO_4.5H_2O$: Se= 100:10:1), 2 mL 30% $H_2O_2$ and 3 mL $H_2SO_4$

**Table 1. Initial soil properties of the experimental site at BAU Farm**

| Soil properties | Numerical values | Class as per FRG* |
|---|---|---|
| Soil texture | Sand 22.4%<br>Silt 65.0%<br>Clay 12.6% | Silt loam |
| Soil pH | 6.4 | Slightly acidic |
| Organic matter | 1.55% | Low |
| Total N | 0.091% | Very low |
| Available P | 3.30 $mgkg^{-1}$ | Very low |
| Exchangeable K | 0.08 me $100^{-1}$ g soil, | Low |
| Available S | 6.46 $mgkg^{-1}$ | Very low |
| Available Zn | 0.86 $mgkg^{-1}$ | Low |

*FRG: Fertilizer Recommendation Guide developed by BARC (2012)

**Table 2. Effect of nitrogen supplied from urea and NEB-26 on the yield attributes of potato**

| Treatments | Plant Height (cm) | Plants $hill^{-1}$ (No.) | Leaves $plant^{-1}$ (No.) | Tubers $Plant^{-1}$ (No.) | Weight of tubers $hill^{-1}$ (g) |
|---|---|---|---|---|---|
| $T_1$ (Control) | 34.35d | 2.70c | 33.10c | 8.60c | 152.60d |
| $T_2$ (100% N FROM UREA) | 51.55a | 5.00a | 46.30a | 14.40a | 344.40a |
| $T_3$ (50% N) | 41.75bc | 3.65b | 39.40b | 11.55b | 172.85cd |
| $T_4$ (50% N +500 mL $ha^{-1}$ NEB-26) | 46.40ab | 4.15b | 43.20ab | 12.80ab | 257.95b |
| $T_5$ (50% N + 750 mL $ha^{-1}$ NEB -26) | 40.45c | 3.85b | 40.55b | 11.80b | 200.20c |
| CV (%) | 8.02 | 11.35 | 8.12 | 10.26 | 12.60 |
| SE (±) | 1.72 | 0.21 | 1.64 | 0.60 | 14.21 |

The figures having common letter(s) in a column do not differ significantly at 5% level of significance by DMRT CV Co-efficient of variation; SE = Standard error of means.

**Table 3. Tuber and haulm yield of potato as influenced by Urea-N and NEB-26**

| Treatments | Tuber yield (t $ha^{-1}$) | Haulm yield (t $ha^{-1}$) |
|---|---|---|
| $T_1$ (Control) | 10.83c | 0.35e |
| T2 (100% N FROM UREA) | 23.20a | 1.40a |
| $T_3$ (50% N) | 16.36b | 0.60d |
| $T_4$ (50% N +500 mL $ha^{-1}$ NEB-26) | 21.52a | 1.19b |
| $T_5$ (50% N + 750 mL $ha^{-1}$ NEB -26) | 14.70bc | 0.80c |
| CV (%) | 15.49 | 9.08 |
| SE(±) | 1.34 | 0.03 |

The figures having common letter(s) in a column do not differ significantly at 5% level of significance by DMRT CV = Co-efficient of variation; SE = Standard error of means.

were added. After swirling the flask, it was allowed to stand for about 30 minutes. Then the flask was heated (380ºC) until the digest became clear and colorless. After cooling, the content was taken into 100 mL volumetric flask and the volume was made up to the mark with distilled water. A reagent blank was prepared in a similar manner. This digest was used for total N determination. For this, 40% NaOH was added with the digest for distillation. The evolved ammonia was trapped into 4% $H_3BO_3$ solution and 5 drops of mixed indicator of bromocresol green ($C_{21}H_{14}O_5Br_4S$) and methyl red solution and the distillate was titrated with standard 0.01 N $H_2SO_4$ until the color changed from green to pink (Bremner and Mulvaney, 1982). The amount of N was calculated using the formula:

%N = ((T-B) × N × 0.014 × 100)/S, where T = sample titration value (mL) of standard $H_2SO_4$, B = blank titration value (mL) of standard $H_2SO_4$, N = strength of $H_2SO_4$, S = weight of soil sample in g.

### Nitrogen uptake

Nitrogen uptake was calculated from the N contents using the formula N uptake = [N content (%) × Yield (kg $ha^{-1}$)]/100.

### Protein content

The protein content of potato tuber was calculated by multiplying the N content of potato tuber with 6.25.

### Chemical analyses of soil samples

Initial soil samples were collected at a depth of 0-15 cm from the surface. After removing weeds, plant roots, stubbles, and stones, the samples were air dried and ground to pass through a 2 mm (10 meshes) sieve. The samples were then stored in clean plastic bags until further chemical and mechanical analyses. Initial soil samples were analyzed for physical and chemical properties following standard methods. Particle size analysis of soil was done by hydrometer method (Black, 1965) and the textural class was determined according to the USDA system. Organic matter was determined by Walkley and Black meth

od (Walkley and Black,1934), soil pH (1:2.5 soil-water) by glass electrode pH meter method (Michael, 1965), total N by Semi-micro Kjeldahl method (Bremner and Mulvaney, 1982), available P by Olsen method (Olsen et al., 1954), exchangeable K by Flame Photometer after extraction with 1N NH4OAc at pH 7.0 (Knudsen et al., 1982), available S by extracting soil samples with $CaCl_2$, solution (0.15%) and by measuring turbidity by spectrophotometer (Williams and Steinbergs,1959) method and CEC by sodium saturation method (Chapman, 1965).

### Statistical analysis

The collected data were analyzed statistically by F-test to examine the treatment effects and the mean differences were adjusted by Duncan's New Multiple Range Test (DMRT) (Gomez and Gomez, 1984).

## Results and Discussion

### Growth parameters

The growth parameters of potato were significantly influenced by N supplied from urea and NEB-26 (Table 2). The plant height varied from 34.35 to 51.55 cm over the treatments. The tallest plant (51.55 cm) was observed with the treatment $T_2$ (100% N from urea) which was statistically similar to $T_4$ (50% N from urea + 500 mL $ha^{-1}$ NEB-26) and the rest was followed by $T_3$ (50% N from urea) and $T_5$ (50% N from urea + 750 mL $ha^{-1}$ NEB-26) with the value of 41.75 and 40.45 cm, respectively. The shortest plant of 34.35 cm was recorded with the treatment $T_1$ (Control). The number of plants $hill^{-1}$ varied significantly due to different treatments. The number of plants $hill^{-1}$ ranged from 2.7 to 5.0 across the treatments. The maximum value (5.0) was recorded in $T_2$ (100% N from urea). The number of plants $hill^{-1}$ obtained with the treatments $T_3$ (50% N from urea) and $T_5$ (50% N from urea + 750 mL $ha^{-1}$ NEB-26) was statistically similar. The minimum value of 2.70 was found in $T_1$ (Control). The number of leaves $plant^{-1}$ varied from 33.1 to

**Table 4. Effect of nitrogen supplied from urea and NEB-26 on the N content and uptake of tuber and haulm of potato**

| Treatments | N content (%) | | N uptake (kg ha$^{-1}$) | | |
|---|---|---|---|---|---|
| | Tuber | Haulm | Tuber | Haulm | Total |
| $T_1$ (Control) | 0.26d | 2.78c | 28.65c | 9.86e | 38.51d |
| T2 (100% N FROM UREA) | 0.34a | 3.19a | 80.25a | 44.81a | 125.06a |
| $T_3$ (50% N) | 0.29c | 2.94b | 47.85b | 17.75d | 65.61c |
| $T_4$ (50% N +500 mL ha$^{-1}$ NEB-26) | 0.32b | 3.14a | 69.38a | 37.60b | 106.98b |
| $T_5$ (50% N + 750 mL ha$^{-1}$ NEB -26) | 0.30bc | 2.94b | 45.28b | 23.65c | 68.93c |
| CV (%) | 5.13 | 1.62 | 17.86 | 8.75 | 10.63 |
| SE (±) | 0.00 | 0.02 | 4.84 | 1.16 | 4.30 |

The figures having common letter(s) in a column do not differ significantly at 5% level of significance by DMRT

CV = Co-efficient of variation; SE = Standard error of means.

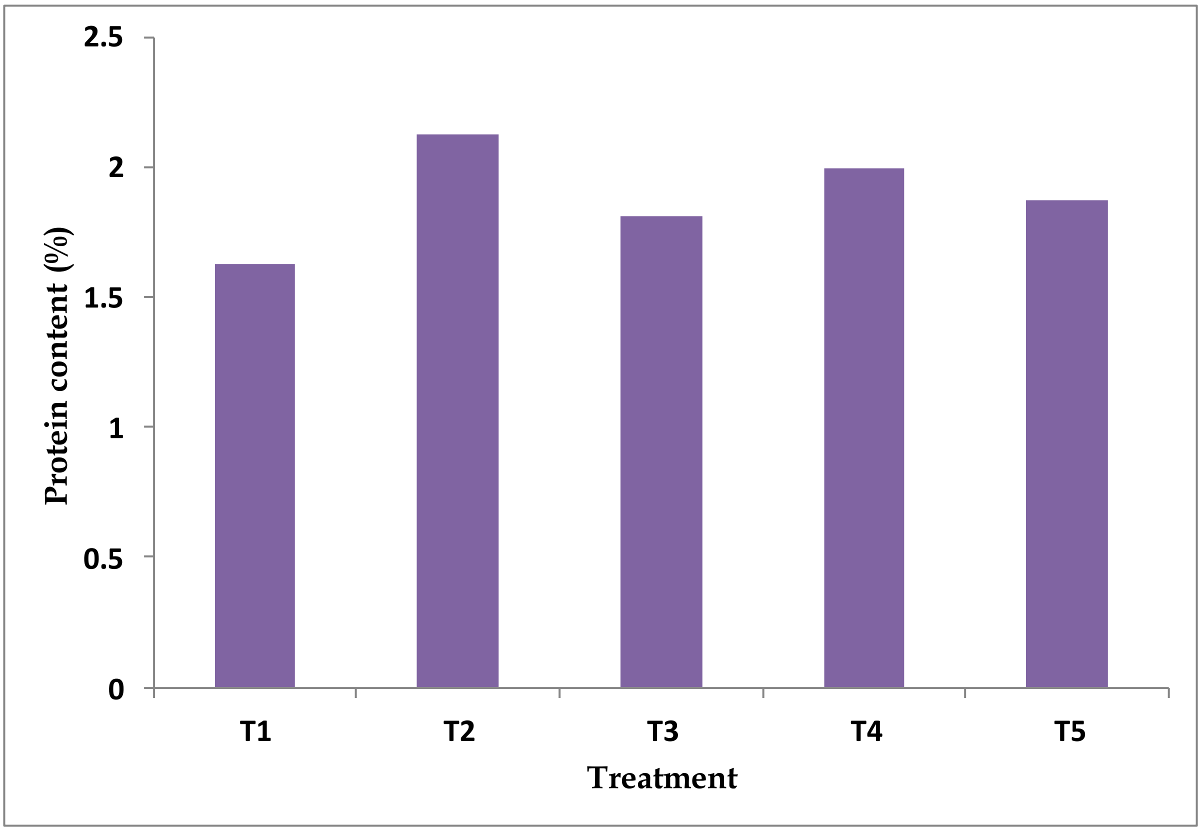


**Fig. 1** Protein content of potato tuber as influenced by N supplied from urea and NEB-26

46.3 across the treatments. The maximum number of leaves plant$^{-1}$(46.3) was recorded in $T_2$ (100% N from urea) followed by $T_4$ (50% N from urea + 500 mL ha$^{-1}$ NEB-26) whose value was 43.2. The number of leaves plant$^{-1}$ over the treatments $T_3$ (50% N from urea) and $T_5$ (50% N from urea + 750 mL ha$^{-1}$ NEB-26) was statistically similar. The minimum value of 33.1 was found in $T_1$ (Control). Nitrogen has a positive role in tuber formation. The number of tubers plant$^{-1}$ differed significantly due to different treatments. The number of tubers plant$^{-1}$ ranged from 4.6 to 14.4. The highest value (14.4) was obtained from the treatment $T_2$ (100% N from urea) which was followed by $T_4$ (50%N from urea + 500 mL ha$^{-1}$ NEB-26) with the value of 12.4. The number of tubers plant$^{-1}$ obtained from the treatments $T_3$ (50% N from urea) and $T_5$ (50% N from urea + 750 mL ha$^{-1}$ NEB-26) were identical. The lowest number of tubers plant$^{-1}$ (8.60) was found with the treatment $T_1$ (Control). The weight of tubers hill$^{-1}$ varied from 152.6 to 344.4 g. The maximum weight of tubers hill$^{-1}$ (344.4 g) was recorded in the treatment $T_2$ (100% N from urea) which was followed by $T_4$ (50% N from urea + 500 mL ha$^{-1}$ NEB-26), $T_5$ (50% N from urea + 750 mL ha$^{-1}$ NEB-26) and $T_3$ (50% N from urea) with the value 257.95, 200.2 and 172.85 g, respectively. The lowest weight of tubers plant$^{-1}$ (152.6 g) was found in $T_1$ (Control). The yield attributes of potato obtained in the present study are well corroborated with Sriom et al. (2017) who demonstrated that yield attributes of potato were influenced by the levels of N.

**Tuber yield of potato**

The yield of potato tuber was significantly influenced by different treatments (Table 3). The tuber yield varied from 10.83 to 23.20 t h$^{-1}$. The highest tuber yield of 23.20 t ha$^{-1}$ was obtained with the treatment $T_2$ (100% N) which was statistically similar with the treatment $T_4$ (50%N from urea + 500 mL ha$^{-1}$ NEB-26) in respect of tuber yield (21.52 t ha$^{-1}$). The tuber yield produced by the treatments $T_3$ (50% N from urea) and $T_5$ (50% N from urea + 750 mL ha$^{-1}$ NEB-26) was statistically similar but lower than that obtained with $T_4$. The lowest yield of 10.83 t ha$^{-1}$ was obtained with the treatment $T_1$ (Control). The results obtained from the present trial are in agreement with Zisheng *et al.* (2016) who found increased tuber yield maximum by 76% due to the use of N fertilizers as compared to untreated control. Kołodziejczyk (2014) and Antons and Ilze (2013) also demonstrated potato tuber yield increase with the application of different levels of N fertilizers.

**Haulm yield of potato**

Like tuber yield, the haulm yield of potato was also markedly influenced by different treatments as indicated in (Table 3). The haulm yield (sun dry basis) ranged from 0.35 to 1.40 t ha$^{-1}$. The highest haulm yield (1.40 t ha$^{-1}$) was observed in $T_2$ (100% N from urea) which was followed by $T_4$, $T_5$ and $T_3$ with the value of 1.19, 0.80 and 0.60 t ha$^{-1}$, respectively. The lowest haulm yield (0.35 t ha$^{-1}$) was obtained with $T_1$ treatment (Control). The haulm yield of potato of the present study supports the findings of Vaezzadeh (2012) who observed increased haulm yield due to application of different levels of N as urea.

**Nitrogen content of potato tuber and haulm**

The N content of potato tuber due to various treatments ranged from 0.26-0.34% (Table 4). The highest N content of tuber (0.34%) was observed with the treatment $T_2$ (100% N from urea) and the lowest value (0.26%) was recorded in $T_1$ (Control). The N content of potato tuber was 0.32, 0.30 and 0.29% in the treatments $T_4$, $T_5$ and $T_3$, respectively. The N content of haulm ranged from 2.78-3.14% due to application of N as NEB-26 in combination with urea (Table 4). The highest N content of haulm (3.19%) was observed with the treatment $T_2$ (100% N from urea) which was identical to the treatment $T_4$ (50% N from urea + 500 mL ha$^{-1}$ NEB-26). There was no significant difference between the N content of haulm obtained with treatments $T_3$ and $T_5$. The lowest value was observed in $T_1$ (Control). The results are at par with Antons and Ilze (2013) who reported that application of N fertilizer in the form of urea produced higher N content of potato with respect to untreated ones.

### Nitrogen uptake by potato tuber and haulm

The results presented in the Table 4 indicate that the N uptake by potato differed remarkably with the application of N in the form of NEB-26 in combination with urea. The N uptake by potato tuber varied from 28.65-80.25 kg ha$^{-1}$. The maximum N uptake by potato tuber (80.25 kg ha$^{-1}$) was recorded with the treatment $T_2$ (100% N from urea) which was statistically similar with the treatment $T_4$ (50% N from urea + 500 mL ha$^{-1}$ NEB-26). Again the N uptake of potato tuber with the treatments $T_3$ and $T_5$ were also statistically similar. The lowest N uptake of potato tuber (28.65kg ha$^{-1}$) was observed with the treatment $T_1$ (Control). On the other hand, the N uptake by potato haulm ranged from 9.86-44.81 kg ha$^{-1}$ across the treatments (Table 4). The highest N uptake (44.81 kg ha$^{-1}$) was observed with the treatment $T_2$ (100% N from urea) which was followed by the treatments$T_4$ (50% N from urea + 500 mL ha$^{-1}$ NEB-26), $T_5$ (50% N from urea + 750 mL ha$^{-1}$ NEB-26) and $T_3$ (50% N from urea) with the value of 37.60, 23.65 and 17.75 kg ha$^{-1}$, respectively. The lowest N uptake of haulm (9.86 kg ha$^{-1}$) was observed with the treatment $T_1$ (Control). Total N uptake by potato varied significantly based on different treatments from 38.51-125.06 kg ha$^{-1}$ (Table 4). The highest N uptake (125.06 kg ha$^{-1}$) was recorded in the treatment $T_2$ (100% N from urea) which was followed by the treatment $T_4$ (50% N from urea + 500 mL ha$^{-1}$ NEB-26) with the value of 106.98 kg ha$^{-1}$. The lowest total N uptake of 38.51 kg ha$^{-1}$ was observed with the treatment $T_1$ (Control). The N uptake by potato of the present investigation is in agreement with Vaezzadeh (2012) who monitored enhanced N uptake by potato with the application of N as urea at different levels.

### Protein content of potato tuber

The protein content of potato tuber as influenced by the N supplied form urea and NEB-26 has been illustrated in Figure 1. The highest protein content of tuber was noted in $T_2$ (100% N from urea) followed by $T_4$ (50% N + 500 mL ha$^{-1}$ NEB-26). The protein content obtained by $T_3$ (50% N from urea) and $T_5$ (50% N from urea + 750 mL ha$^{-1}$ NEB-26) was approximately similar. The lowest protein content was found in $T_1$ (Control). It indicates that the tuber quality was not affected by the source of nitrogen. The results of the present study are in agreement with Solaiman (2000) who reported that tuber specific gravity, dry matter percentage, protein, reducing sugar and non-reducing sugar contents, and total sugar content of potato were not significantly affected by the N source.

### Conclusion

The highest tuber yield of potato (23.20t ha$^{-1}$) was found in $T_2$ (100% N from urea) which was statistically similar to $T_4$ (50% N from urea + 500 mL ha$^{-1}$ NEB-26) with the value of 21.52 t ha$^{-1}$. Again, the treatment $T_4$ was similar with $T_2$ in relation to plant height, number of leaves plant$^{-1}$ and number of tubers plant$^{-1}$. These results are in consistent with tuber yield of potato. Based on these results, it can be concluded that the use of NEB-26 in combination with urea can save about 30% N without reducing potato yield. However, further trial in different AEZs of Bangladesh is needed for concrete recommendation.

### Acknowledgement

We sincerely acknowledge the Department of Soil Science, Bangladesh Agricultural University, Mymensingh, Bangladesh for providing acilities for conducting this research.

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