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## Effect of soluble fertilizer (1% Urea) on yield of coriander Var. Super Midori)

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### Abstract

An experiment entitled “Integrated nutrient management of Coriander variety Super Midori” of Tokita seed was conducted in the Department of Vegetable Science, College of Agriculture, OUAT, Bhubaneswar during *Rabi* 2013 - 2014 to assess the effect of nitrogen (50, 60 and 70 kg/ha), potash (50 and 60 kg/ha) in combination with FYM (20 t/ha), phosphorous (40 kg/ha) and foliar spray of urea (1%) on growth, growth attributing characters and yield of coriander leaves under two sets of experiment i.e. line sowing and broadcasting. Foliar application of Urea (1%) resulted in significantly higher yield producing 16.82 t/ha in line sowing with N<sub>3</sub>K<sub>2</sub> treatment whereas 16.28 t/ha with N<sub>3</sub>K<sub>2</sub> treatment in broadcast practice.

**Keywords:** Nitrogen, potash, Var. super Midori

### Introduction

Coriander (*Coriandrum sativum* L.) family Apiaceae is an important seed spices cultivated in almost all the states of India for its leaves and seeds. Coriander is probably one of the five spices used by mankind, having been known as early as 5000 BC. Coriander is an annual herb originated in the Mediterranean region is now mainly grown in India (Area 547421ha and production 527390 tonnes), Morocco, Canada, Romania, Russia, Ukraine, Iran, Turkey, Israel, Egypt, China, USA, Argentina *etc.* and is commonly known as coriander, cilantro, or Chinese parsley. The plant is named after Koris, the Greek word for bug, as the unripe fruits have a smell that has been compared to the bed bugs. Coriander seeds have 0.5 to 2.0 percent essential oil which contains about 42 per cent d-linalool and 21 percent linalyl acetate as major constituents and the other important constituents are thymol, caryophyllene and pinene. In addition to essential oil, coriander seed contains 19-20 per cent fatty oil and is rich in vit A and vit C. The oil in western countries is used for flavoring liquors like gin, beverages and variety of foodstuffs. It is also used for the synthesis of citrol from linalool which the oil contains and subsequent synthesis of vitamin A from citrol. Coriander is largely cultivated as a spice crop both for seed purpose & leaves purpose in almost all the states on commercial scales like Rajasthan, Andhra Pradesh, Madhya Pradesh, Tamilnadu, Gujarat, Uttar Pradesh, Bihar, Karnataka and Odisha.

### Materials and Methods

The field experimental entitled “Integrated nutrient management in coriander Variety super Midori” was carried out in the experiment plot of the Department of Vegetable Science, OUAT during 2013-14. The present experiment constitutes six treatments with four replications in Randomized Block design (Factorial). The coriander variety “Super Midori” was sown in the trial field. The detail of the experiment conducted is given below.

1. Design Layout- Complete Randomized block design (factorial).
2. Number of Treatment - 6
3. Number of replications - 4
4. Number of Trials-2 (line sowing and broadcasting)
5. Total of number of plots - 24
6. Plot Size - 1m x 1.5 m
7. Spacing - row to row - 10 cm

### Line to line - continuous thinly sowing of seeds

8. Number of rows per plot - 14
9. Length of the experimental field - 10.5 m
10. Width of the experimental field - 5 m
11. Area of the experimental field - 52.5 m<sup>2</sup>
12. Two trial were conducted, one for line showing & other for broadcasting.

**Levels of chemical fertilizers**

N1 - 50 kg of Nitrogen/ha.  
 N2 - 60 kg of Nitrogen/ha.  
 N3 - 70 kg of Nitrogen/ha.  
 K1 - 50 kg of Potassium/ha.  
 K2 - 60 kg of potassium /ha.  
 FYM- @ 20 t/ha.

**Foliar Sprays of 1% Urea**

Details of Treatments

T1 - N1PK1-50:40:50  
 T2 - N1PK2 -50:40: 60  
 T3 - N2PK1 - 60:40:50  
 T4 - N2PK2 - 60:40:60  
 T5 - N3PK1 - 70:40:50  
 T6 - N3PK2 - 70:40:60

Yield per plot with 1% urea spray: At 18<sup>th</sup> day of germination 1% urea spray was done both in line sowing & broadcasting. The selected plants lines were harvested separately & yield per plot was calculated.

Yield (tones/ha) with 1% Urea spray: In the experiment datas were recorded from the selected plants in line sowing and broadcasting and yield per plot was calculated, from the yield per plot, yield per hectare was calculated and expressed in tones/ha.

**Discussion**

The yield of coriander leaves due to 1% foliar spray of urea is presented in Table – 1, plot yield of 3.66 kg of leaves was recorded with N3 followed by 3.37 kg in N2 and 3.16 kg in N1. In Potash application a yield of 3.47 kg was recorded in K2 followed by 3.33 kg in K1. Due to interaction effect a highest yield of 3.74 kg/plot was recorded in N3K2, followed by 3.58 kg in N3K1, 3.42 kg N2K2, 3.32 kg in N2K1, 3.25 in N1K2 and 3.08 kg in N1K1.

The yield of coriander leaves due to 1% foliar spray of urea is presented in Table – 2, plot yield of 3.60 kg of leaves was recorded with N3 followed by 3.18 kg in N2 and 2.82 kg in N1. Due to varied dose of Potash a yield of 3.31 kg/plot was recorded in K2 followed by 3.03 kg in K1. Due to interaction effect a highest yield of 3.62 kg/plot was recorded in N3K2, followed by 3.57 kg in N3K1, 3.32 kg N2K2, 3.05 kg in N2K1, 3.25 in N1K2 and 2.99 kg in N1K1 and 2.65 kg in N1K1.

The yield of coriander in tons per hectare due to 1% foliar spray of urea in line sowing is presented in Table - 3. It was found that yield of 16.47 (t/ha) was recorded in N1 followed by 15.17 (t/ha) in N2 and 14.24 (t/ha) in N3. Due to potash application highest yield of 15.60 (t/ha) was recorded in K2 followed by 14.98 (t/ha) in K1. In the combination effect 16.82 (t/ha) was recorded with N3K2 followed by 16.12 (t/ha) in N3K1, 15.40 (t/ha) in N2K2, 14.94 (t/ha) in N2K1, 14.60 (t/ha) in N1K2 and 13.88 (t/ha) in N1K1.

The yield of coriander in broad casting due to 1% foliar spray of urea is presented in Table -4. It was found that a yield of coriander leaves was highest in N3 16.18 (t/ha) followed by 14.26 (t/ha) in N2 and 12.68 (t/ha) in N1. Due to varied dose of potash application yield of 14.84 (t/ha) was recorded in K2 followed by 13.90 (t/ha) in K1. Due to interaction of nitrogen and potash a yield of 16.28 (t/ha) was recorded in N3K2, followed by 16.08 (t/ha) in N3K1, 14.82 (t/ha) N2K2, 13.70 in N2K1, 13.44 (t/ha) in N1K2 and 11.93 (t/ha) N1K1.

Foliar spray of urea at 1% concentration in 18<sup>th</sup> days of germination has greatly influenced the yield of leaves both in line sowing & broadcasting due to quick response of urea

absorbed through the leaves. A yield of 3.74 kg/plot in line sowing was recorded in N3K2 as compared to 3.62 kg/plot in N3K2 in broadcasting. The lowest yield of 3.16 kg/plot in line sowing was recorded due to N1 in line sowing and 2.82 kg in N1 in broadcasting. Similarly increase trend of yield in tones/hectare was observed both in line sowing & broadcast which was superior to interaction effect of nitrogen & potash. The finding is in accordance and observation of Balaji and Keshwa (2011) [2] and Sharangi *et al.* (2011) [1] in coriander. Urea is commonly used for foliar fertilization because of its unchanged, high solubility and is rapidly and efficiently absorbed by leaves. Once urea is absorbed, it changed to Ammonia & Carbon dioxide by enzyme Urease found in the leaves of many plants. Foliar urea absorption is affected by external factor such as temperature and moisture. High leaf surface moisture followed by drying during urea application can because nitrogen loses from ammonia volatilization. It was observed that plants contains a high amount of nitrogen will show a smaller response to foliar application of urea than plants containing less nitrogen. This is partially a result of plants with low nitrogen status being more efficient in absorbing and translocating nitrogen form foliar urea application that those with higher nitrogen status. Water soluble fertilizers having major three nutrients can work hand-in-hand to provide greater benefits than either fertilizer technology alone.

**Table 1:** Yield of coriander leaves due to 1% foliar spray (kg/plot) (line sowing)

Mean table (kg/plot)			
	K1	K2	Mean
N1	3.08	3.25	3.16
N2	3.32	3.42	3.37
N3	3.58	3.74	3.66
Mean	3.33	3.47	

		N	K	N x K
	Sem	0.128	0.090	0.156
NS	CD 5%	0.384	0.272	0.471
S	CV %	12.26		

**Table 2:** Yield of coriander leaves due to 1% foliar spray (kg/plot) (broadcasting)

Mean table (kg/plot)			
	K1	K2	Mean
N1	2.65	2.99	2.82
N2	3.05	3.32	3.18
N3	3.57	3.62	3.60
Mean	3.09	3.31	

		N	K	N x K
	Sem	0.143	0.101	0.175
NS	CD 5%	0.431	0.305	0.528
S	CV %	14.62		

**Table 3:** Yield of coriander leaves due to 1% urea spray (line sowing)

Mean table (t/ha)			
	K1	K2	Mean
N1	13.88	14.60	14.24
N2	14.94	15.40	15.17
N3	16.12	16.82	16.47
Mean	14.98	15.60	

		N	K	N x K
	Sem	0.574	0.406	0.703
NS	CD 5%	1.731	1.224	2.120
S	CV %	12.26		

**Table 4:** Yield of coriander leaves due to 1% urea spray (broadcasting)

Mean table (t/ha)			
	K1	K2	Mean
N1	11.93	13.44	12.68
N2	13.70	14.82	14.26
N3	16.08	16.28	16.18
Mean	13.90	14.84	

		N	K	N x K
	Sem	0.643	0.455	0.788
NS	CD 5%	1.939	1.371	2.375
S	CV %	14.62		

### Conclusion

It was concluded that the yield of 16.47 (t/ha) was recorded in N1 and in the combination effect 16.82 (t/ha) was recorded with N3K2 with foliar application of 1 % urea. In case of broadcasting practice it was found that a yield of coriander leaves was highest in N3, 16.18 (t/ha). Due to interaction of nitrogen and potash a yield of 16.28 (t/ha) was recorded in N3K2 with foliar application of 1 % urea. The result indicates that the above nutrient management to be adopted by farmers to get maximum yield.

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