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D Mounika
Water Technology Centre, College of Agriculture, Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad, India

M Uma Devi
Water Technology Centre, College of Agriculture, Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad, India

V Praveen Rao
Water Technology Centre, College of Agriculture, Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad, India

K Avil Kumar
Water Technology Centre, College of Agriculture, Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad, India

B Neeraja Prabakar
Water Technology Centre, College of Agriculture, Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad, India

Correspondence
D Mounika
Water Technology Centre, College of Agriculture, Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad, India

Effect of different N and K fertigation levels on quality parameters and yield of paprika (*Capsicum annum* L) under drip fertigation

D Mounika, M Uma Devi, V Praveen Rao, K Avil Kumar and B Neeraja Prabakar

Abstract
A field experiment was conducted at Water Technology Centre, College farm, Rajendranagar, Hyderabad during *rabi*, 2014-15 to study the "Paprika (*Capsicum annuum* L) response to fertigation levels of nitrogen and potassium". The experiment was conducted with variety Agnirekha in a randomized block design with three replications. The treatments were eleven, viz., soil application of 100% N and K_2O with drip irrigation (T_1) and with furrow irrigation (T_2); drip Fertigation of 75% N+75%,100% and 125% K_2O (T_3, T_4, T_5, respectively); drip fertigation of 100% N +75%, 100% and 125% K_2O (T_6, T_7, T_8 respectively); drip fertigation of 125% N+75%, 100% and 125% K_2O (T_9,T_{10},T_{11} respectively). The 100% N and K levels were 250 N and 150 K_2O, kg ha^{-1}. Basal dose of 100 kg P_2O_5 ha^{-1} through single super phosphate was applied to all the treatments by soil application. N and K fertilizers for T_1 and T_2 were applied to soil in three equal splits at 10, 35 and 60 DAT and N and K fertigation was in 38 splits through urea and potassium nitrate. Drip irrigation was scheduled (T_1 to T_{11}, except T_2) once in 2 days based on daily data of USWB class 'A' pan evaporimeter and furrow irrigation (T_2) was at 1.0 IW/CPE ratio with 60 mm irrigation depth in furrows in between paired rows (80 cm/40 cm). The amount of total irrigation water applied was 6381 m^3 and 7483 m^3 in drip irrigation and furrow irrigation treatments respectively. The data on total fresh fruit yield (six pickings) (kg ha^{-1}), quality attributes of chilli were recorded. Along with that economics was calculated.

Keywords: Paprika (*Capsicum annum* L), drip fertigation, pan evaporimeter, effective rainfall, quality attributes and economics

Introduction
Water and fertilizer are the two important inputs in agriculture and becoming scarce and costly over years. Their efficient use is basic for the survival of agriculture, due to shrinking land: man and water: man ratios, increasing fertilizer prices, hunting energy crisis, wide spread pollution and fast degradation of natural resources. Therefore, there is a need for technological options, which will help in sustaining the precious resources and maximizing crop production with least detrimental impact on the environment. The sustainability of any production system requires optimum utilization of resources like water, fertilizer or soil. Efficient use of water and fertilizers is highly critical to sustain the agricultural production, more particularly in the context of declining per capita land and water availability, pollution and increasing cost of fertilizers. Fertigation is the application of water and fertilizers simultaneously to the crops only to the wetted root volume where the active roots are concentrated through micro irrigation systems *i.e*, drip, microjets or micro sprinklers. Paprika (*Capsicum annuum* L.) is a less pungent widely used chilli variety and is an important vegetable cum condiment. It is also locally known as *Bajji mirchi*. It is used as an ingredient in a broad variety of dishes throughout the world. It is now gaining more importance in the global market because of its value added products like chilli powder, paste, oleoresin, capsanthin and capsaicin *etc*. India is a major producer, exporter and consumer of chilli with an area of 794 thousand hectares and production of 1304 thousand million tones with a productivity of 1.6 t ha^{-1} (Indian horticultural data base 2013). The world area and production of chilli is around 15 lakh ha and 70 lakh tonne respectively. Drip is the only option to replace the conventional irrigation method to achieve water-use efficiency. It keeps the soil moisture near to field capacity and also increases fertilizer use efficiency by avoiding losses through leaching, volatilization and fixing of nutrient in the soil (Narayan, 2004).

Materials and methods

A field experiment was conducted at Water Technology Centre, College farm, Rajendranagar, Hyderabad during *rabi*, 2014-15 to study the "Paprika (*Capsicum annuum* L) response to fertigation levels of nitrogen and potassium". The experiment was conducted with variety Agnirekha in a randomized block design with three replications. The treatments were eleven, viz., soil application of 100% N and K_2O with drip irrigation (T_1) and with furrow irrigation (T_2);drip Fertigation of 75% N+75%,100% and 125% K_2O (T_3, T_4, T_5, respectively); drip fertigation of 100% N +75%, 100% and 125% K_2O (T_6, T_7, T_8 respectively); drip fertigation of 125% N+75%, 100% and 125% K_2O (T_9,T_{10},T_{11} respectively). The 100% N and K levels were 250 N and 150 K_2O, kg ha^{-1}. Basal dose of 100 kg P_2O_5 ha^{-1} through single super phosphate was applied to all the treatments by soil application. N and K fertilizers for T_1 and T_2 were applied to soil in three equal splits at 10, 35 and 60 DAT and N and K fertigation was in 38 splits through urea and potassium nitrate (six, four, four and 24 splits during vegetative stage *i.e* 12-32 DAT, flowering to fruit initiation stage *i.e* 35-46 DAT, fruit initiation to first picking *i.e* 49-60 DAT and first picking on wards from 63-143 DAT respectively) twice in a week at the rate of 18%, 14%, 20% and 48% of N and 14%, 16%, 22% and 48% of K_2O during these four growth stages, respectively. Drip irrigation was scheduled (T_1 to T_{11}, except T_2) once in 2 days based on daily data of USWB class 'A' pan evaporimeter and furrow irrigation (T_2) was at 1.0 IW/CPE ratio with 60 mm irrigation depth in furrows in between paired rows (80 cm/40 cm).

The experimental soil was sandy loam in texture, slightly alkaline in reaction, non saline, low in available nitrogen, high in organic carbon, available phosphorus and potassium. The weekly mean relative humidity ranged from 47.6% to 88.1% with a overall mean of 64.4%. The number of sunshine hour's day^{-1} ranged from 3.3 to 9.9 hours with a mean of 6.8 hours day^{-1}. The wind speed varied from 1.0 km to 12.1 km $hour^{-1}$ with a mean of 6.8 hours day^{-1}. The E pan data varied from 2.0 to 5.6 mm with a mean of 3.8 mm. The total amount of rain fall during the crop growth period including nursery period was 324.5 mm, received in 21 days. The total E pan data during the crop growth period including nursery period was 742.7 mm.

The paprika variety Agnirekha from the company Syngenta was as variety crop. Plants of this variety are vigorous, 60-100 cm height with strong lateral branches. The fruit**s** are medium long, thick walled and uniform. Bearing is solitary. Average fruit length is 10-11 cm and around 1.5 cm in diameter.

Nursery

The seeds having 70 percent germination was dibbled in lines on raised beds in the nursery. Before sowing, the nursery area was ploughed with tractor drawn cultivator till fine tilth was obtained. After completion of land preparation, nursery beds of 15 numbers were prepared. The total number of beds was 15. Each bed area was 1.8 m^2 (length= 2.0 m, width = 0.9 m). Total area of nursery beds was 27 m^2. Each bed received 250 g of neem cake, 0.5 kg of vermicompost, 3.5 kg of FYM and nearly 25 kg of red soil. After wards, all the beds were thoroughly drenched with copper oxy chloride (COC) @ (3 g L^{-1}). A day after nursery sowing was done after treating the seeds with acephate @ 1 g per 10 g seed. In each bed, width wise, ten rows were maintained. Eighty grams of seed was used. Approximately, 1300 seed were present in each ten grams seed pack. After sowing, all beds were covered with dried rice straw for a period of five days till germination was obtained.

Main field preparation and manures application:

After collection of the initial soil samples, the main field was thoroughly ploughed thrice and leveled. The field received powdered neem cake @ 460 kg ha^{-1} mixed with *Trichoderma viridi* @ 3 kg ha^{-1} which was mixed in the field and leveling of the individual treatment plots was done. The drip lines were arranged for all the treatment plots and the drip system was checked for its flow rate. Every plot had five drip line laterals. The lateral spacing was 1.2 m. The flow rate was 2 lps (liters per second). A day before planting entire field was thoroughly wetted by using the drip irrigation system.

Transplanting

After pulling the 35 days old seedlings from nursery, they were dipped in a slurry prepared by mixing 0.5 kg *Trichoderma viridi* and 0.5 kg *Azospirillum* for one hour. Then they were transplanted on 6th September, 2014, adopting a spacing of 80 cm between the rows and 40 cm between plants (paired row). The plot size was 6 m x 7.2 m. In each plot, ten rows were made. Every row had 16 plants. Thus in total 160 plants per each treatment plot were maintained. Gap filling was done one week after transplanting with the reserved nursery.

Results and discussion

Fresh fruit yield (kg ha^{-1})

The data on green fruit yield (sum of five pickings), red fruit yield (6^{th} picking) and total fresh fruit yield (green + red fruits) are presented in Table 1. The green, red and total fresh fruit yield of paprika was found to be significantly influenced by different N and K fertigation levels imposed.each picking of chilli tield given Appendix L.

Green fruit yield

The total green fruit yield ranged from 7371 to 20663 kg ha^{-1}. Among different combinations of N and K fertigation levels, the highest green fruit yield was recorded by fertigation at 125% N + 75% K level (T_9) (20,663 kg ha^{-1}) which was on par with 125% N + 125% K (19,495 kg ha^{-1}) and significantly higher over all other treatments. It was noticed that even at lower N levels i.e. at 75% and 100% N also, K level at 75% K was found to be better than 100% or 125% K levels. Increase in K level beyond 75% resulted in decrease in green fruit yield. It was further noticed that 1.67% increase in green fruit yield was observed when fertilizers were applied through Fertigation (T_7) (14,354 kg ha^{-1}) compared to soil application T_1 (14,117 kg ha^{-1}). The advantage of drip irrigation (T_1) was reflected in recording twice the yield of surface irrigation (T_2). The corresponding yields were 14,117 and 7,371 kg ha^{-1} respectively.

Red fruit yield

The red fruit yield ranged from 889 to 6547 kg ha^{-1}. The highest red fruit yield was noticed at 125% N + 100% K (T_{10}) fertigation which was on par with 100% N + 125% K (T_8) and significantly higher over other treatments. Drip fertigation 100% N with different doses of K ranging from 75% to 125% recorded on par red fruit yield. Soil application of fertilizers with drip irrigation (T_1) recorded the significantly lowest red fruits yield. Soil application of 100% N and K under furrow irrigation (T_2) recorded nearly 2.5 times more red fruits yield compared to drip irrigation. Application of 100% N and K by

fertigation (T_7) recorded nearly 3.68 times more red fruit yield compared to application of same dose of N and K through soil application (T_1).

Total fresh fruit yield (green + red fruits) (kg ha^{-1})

The total fresh fruit yield ranged from 9611 to 22,076 kg ha^{-1}. The highest total fresh fruit yield was recorded with drip fertigation of 125% N + 75% K (T_9) which was on par with 125% N + 125% K (T_{11}) (20,822 kg ha^{-1}) and 125% N + 100% K (T_{10}) (20,721 kg ha^{-1}). The lowest yield was recorded with soil application of 100% N and K and furrow irrigation (T_2) (9611) which was on par with fertigation with 75% N + 125% K (T_5) (12584 kg ha^{-1}). At same level of N, increase in K level from 75% to 100 or 125% decrease in total yield was observed indicating 75% K level was sufficient for the paprika crop under the present experimental soil conditions. However, among N levels, the response was positive up to 125% N. Application of 100% N and K applied through fertigation (T_7) resulted in 17% increase in yield compared to same level of N and K applied to soil conventionally and irrigation by drip (T_1). The same level of 100% N and K soil application with drip irrigation treatment (T_1) has recorded 56% higher total fresh paprika fruit yield (15,005 kg ha^{-1}) compared to soil application of same dose of N and K with furrow method (T_2) irrigation (9611 kg ha^{-1}).

In any crop, the yield could be the result of various growth and yield attributing traits. The aim of any applied research is to maximize the yield. In the present investigation, the important yield traits namely, number of fruits per plant, fruit weight and fruit length and width at different growth stages were significantly increased by fertigation with 125% N along with different levels of K, indicating normal 100% recommended level may not be sufficient to meet the requirement for yield potential of paprika. The 125% N has resulted in improved growth vigour of the plant through physiological modifications favourably. Higher amount of nitrogen availability results in promotion of better carbohydrates utilization to form more protoplasm and cells (Pandey *et al*., 2013) [9].

Moisture content of fresh green fruits

The moisture content of fresh green fruits at 57, 70 and 90 DAT is presented in Table 2. The moisture content of fresh green fruits was significantly influenced by different treatments at 70 DAT (Second picking) and 90 DAT (third picking) but not at 57 DAT (first picking) significantly influenced. Higher moisture content was noticed during first picking which was gradually decreased with subsequent pickings.

Moisture content of fresh fruits at 57 DAT (First picking)

It ranged from 25.32 to 40.26%. It was not significantly influenced by different treatments at this stage. In general the highest mean moisture content was noticed at 75% N and K (T_3) and the least at 75% N and 100% K (T_4) application. No consistent trend was noticed at this stage in reflect of moisture content

Moisture content of fresh fruits at 70 DAT (Second picking)

It ranged from 17.74 to 31.42%. The highest mean moisture content was noticed in 75% N + 75% K (T_3) application which was in general on par with 125% and 100% N applications at different K levels and significantly higher over the rest of the treatments. The lowest moisture content was noticed in 100% N and K applied to soil and furrow irrigated (T_2) which was on par with 100% N and K with drip irrigation (T_1), 75% N with 100% K (T_4) and 100% N with 75% K (T_6). Fertigation of 100% N and K (T_7) (25.92%) resulted in 5.25% increase in moisture content of fruits compared to soil application of same levels of N and K and drip irrigated (T_1) (20.64%). There was only 2.9% increase in moisture content of fresh green fruits by drip irrigation at 100% N and K applied to soil compared to furrow irrigation (T_2) at same N and K levels.

Moisture content of fresh fruits at 90 DAT (Third picking)

It ranged from 11.79 to 34.60%. The highest mean moisture content was noticed in 75% N + 100% K (T_4) application which was significantly higher over other treatments. It was followed by 125% N with 100% K (T_{10}) which was on par with 125% N with 75% K (T_9), 100% N with 100% K (T_7), 75% N with 125% K (T_5), 75% N with 75% K (T_3) and 100% N with 75% K (T_6). The lowest moisture content was noticed in 100% N and K applied to soil and furrow irrigated (T_2) which was on par with 75% N with 125% K (T_5), and was significantly lower than other treatments. Fertigation of 100% N and K (T_7) resulted (25.20%) in 6.43% increase in moisture content of fruits compared to soil application of same levels of N and K and drip irrigated (T_1) (18.77%). There was 6.98% increase in moisture content of fresh green fruits by 100% N and K applied to soil and drip irrigated (T_1) (18.77) compared to furrow irrigation (T_2) at same N and K levels (11.79%).

Fruit Quality Parameters

Data on fruit quality parameters like ascorbic acid content in green fruits at 117 DAT and oleoresin, capsanthin and capsaicin contents of red fruits at final harvest (160 DAT) are presented in Table 3. The ascorbic acid content and capsanthin contents were observed to be significantly influenced by the treatments imposed where as the oleoresin and capsaicin contents were not affected by the treatments.

Ascorbic acid content in green fruits at 122 DAT (mg 100 g^{-1})

It ranged from 47.04 to 64.54 mg 100 g^{-1}. The highest ascorbic acid content in green fruits at 117 DAT was observed at 100% N and K (T_7) which was on par with 125% N and K (T_{11}), 75% N with 125% K (T_5), 100% N and K applied to soil and drip irrigation (T_1) and furrow irrigation (T_2) and significantly higher over other treatments. The lowest was found in 75% N and K (T_3). Fertigation of 100% N and K (T_7) (64.54 mg 100 g^{-1}) resulted in 9.7% increase in ascorbic acid content of fruits compared to soil application of same levels of N and K and drip irrigated (T_1) (58.83 mg 100 g^{-1}). There was only 2.1% increase in ascorbic acid content of fresh green fruits at 120 DAT by 100% N and K applied to soil and drip irrigated (T_1) (58.83 mg 100 g^{-1}) compared to furrow irrigation (T_2) at same N and K levels (57.62 mg 100 g^{-1}).

Close relationship exists between carbohydrate metabolism and formation of ascorbic acid (Majumdar *et al.*, 2000, Ananthi *et al.*, 2004 and Prabhavathi, 2008) [6, 1, 8]. Higher ascorbic acid content under fertigated treatments when compared to soil application of fertilizers was also reported by Ramachandrappa *et al*. (2010) [11] and Rana *et al*. (2005) [10]. Availability of nutrients for longer period of time at the root zone area with high frequency fertigation could be responsible for the improvement of ascorbic acid. Kaminwar and Rajagopal (1993) [5] reported positive correlation between K content of *Capsicum* fruits and ascorbic acid content and

Prabhavathi *et al*. (2008) [8] reported positive correlation between N and K content and ascorbic acid content. In the present experiment positive correlation (R= 0.269) was noticed between the fruit N content and the ascorbic acid content of fruits, which however was statistically not significant. Whereas negative correlation was noticed between P and K contents of both shoots and fruits. Increased activity of ascorbic acid oxidise enzyme in presence of micronutrients was reported by Malik *et al*. (2011) [7].

Oleoresin in red fruits at final harvest (160 DAT) (%)

It ranged from 5.43 to 7.80%. The oleoresin content was not significantly influenced by the treatments imposed. The highest oleoresin content in red fruits at final harvest was also observed at 100% N and K (T_7), followed by 125% N with 75% K (T_9) and the lowest was noticed in 100% N and 125% K.

Capsanthin content in red fruits at final harvest (160 DAT)

(EOA values – Essential oil Association of America)

It ranged from 11265 to 15880 EOA values. The highest capsanthin content in red fruits at final harvest was observed at 75% N with 125% K (T_5) which was on par with 125% N with 100% K (T_{10}) and was significantly higher over other treatments. The lowest was found in 75% N and K (T_3) which was significantly lower than other treatments. No significant difference was noticed between fertigation and soil application of fertilizers either with drip irrigation or furrow irrigation.

Capsaicin content in red fruits at final harvest (160 DAT) (%)

It ranged from 0.42 to 0.76%. The capsaicin content of red fruits was also not significantly influenced by the treatments imposed. The highest capsaicin content in red fruits at final harvest was observed at 75% N with 100% K (T_4) which was followed by 100% N with 75% K (T_6) and the lowest were observed in 100% N and K (T_7). Application of 100% N and K to soil by drip (T_1) (0.66%) irrigation has recorded relatively higher capsaicin content than furrow irrigation (T_2) (0.57). These two treatments recorded relatively higher capsaicin content than application of same level of N and K.

In general, non significant effect of different treatments on oleoresin content and capsaicin content of red fruits at harvest indicating that the fruit quality of paprika is more controlled by genetics than management practices. The capsanthin content was positively correlated with fruit N and K contents. Association of K nutrition with increased yields, fruit size, increased soluble solids and ascorbic acid concentrations, improved fruit color and increased shelf life was reported by several scientists. (Prabhavathi *et al*. 2008 and Bhuvaneswari, 2013) [8, 4]. Soil K plays a significant role in enhancing carotenoids syntheses in chillies, tomato and other vegetables. Plants should have adequate supply of N and K particularly at the time of fruit development and maturation. Sudden increase in the uptake of K by plants after 75 days after transplanting which closely correlated with red colour development and split application of K was highly beneficial to get attractive bright red coloured fruits. Partitioning of nutrients in to pericarp and seed components by them revealed except K, all other nutrients got partitioned significantly more in seed, while K got petitioned more in pericarp. This differential partitioning is attributed to their probable role in influencing quality attributes and also due to genetic factor (Bidari and Hebsur, 2011) [3]. Significant and positive influence of both ASTA - American Spice Trade Association levels and sources of potassium was observed on total extractable colour value of red chilli (Prabhavathi *et al*., 2008) [8]. They also found significantly positive correlation between colour value and oleoresin with N, K and S concentration of whole red chillie fruit. In deep black soils, rich in available potassium, colour development was good when compared to red soils, which was due to inadequate K supply and imbalance in sugar: acid ratio in fruits (Bidari *et al*. 2004) [2].

Table 1: Effect of N and K fertigation on paprika total fresh fruit yield (five pickings) red fruit yield (6th picking), total fresh fruit yield (green + red) (kg ha^{-1}) during *rabi* 2014-2015.

Treatments*		Green fruit yield	Red fruit yield	Total fruit yield
T1	Soil application of 100% N and K + drip irrigation	14117	889	15005
T2	Soil application of 100% N and K + furrow irrigation	7371	2240	9611
T3	Fertigation of 75% N + 75% K	16937	1313	18250
T4	Fertigation of 75% N+ 100% K	13251	3937	17188
T5	Fertigaion of 75% N + 125% K	10710	1873	12584
T6	Fertigation of 100% N + 75% K	14262	3866	18128
T7	Fertigation of 100% N+ 100% K	14354	3276	17630
T8	Fertigaion of 100% N + 125% K	12950	4239	17189
T9	Fertigation of 125% N + 75% K	20663	1413	22076
T10	Fertigation of 125% N+ 100% K	14174	6547	20721
T11	Fertigaion of 125% N + 125% K	19495	1326	20822
	SEm±	863	891	1279
	C.D (P=0.05)	2546	2630	3772

Table 2: Effect of N and K fertigation on mean moisture content (%) of paprika at 57, 70, 90, DAT during *rabi* 2014-2015.

Treatments*		Mean moisture content (%)		
		57DAT	70 DAT	90 DAT
T1	Soil application of 100% N and K + drip irrigation	13.07	20.64	19.10
T2	Soil application of 100% N and K + furrow irrigation	15.85	17.74	11.79
T3	Fertigation of 75% N + 75% K	17.87	31.42	22.67
T4	Fertigation of 75% N+ 100% K	16.57	23.06	34.60
T5	Fertigaion of 75% N + 125% K	16.42	27.67	15.03
T6	Fertigation of 100% N + 75% K	15.81	23.61	22.23
T7	Fertigation of 100% N+ 100% K	15.85	25.92	25.20

T8	Fertigaion of 100% N + 125% K	15.25	26.14	18.92
T9	Fertigation of 125% N + 75% K	20.53	26.53	25.88
T10	Fertigation of 125% N+ 100% K	16.28	24.47	26.76
T11	Fertigaion of 125% N + 125% K	16.21	28.36	24.05
	SEm±	1.01	3.49	3.67
	C.D (P=0.05)	2.96	NS	10.83
*****75% N = 187.5 kg N ha^{-1}, 100% N = 250 kg N ha^{-1}, 125% N = 312.5 kg N ha^{-1},				
75% K = 112.5 kg K_2O ha^{-1}, 100% K = 150 kg K_2O ha^{-1}, 125% K = 187.5 kg K_2O ha^{-1},				

Table 3: Effect of N and K fertigation on ascorbic acid content (mg 100^{-1}) of green fruits at 117 DAT of paprika during *rabi* 2014-2015.

Treatments*		Ascorbic acid content (mg 100^{-1})
T1	Soil application of 100% N and K + drip irrigation	58.83
T2	Soil application of 100% N and K + furrow irrigation	57.62
T3	Fertigation of 75% N + 75% K	47.04
T4	Fertigation of 75% N+ 100% K	53.11
T5	Fertigaion of 75% N + 125% K	60.21
T6	Fertigation of 100% N + 75% K	47.92
T7	Fertigation of 100% N+ 100% K	64.54
T8	Fertigaion of 100% N + 125% K	50.10
T9	Fertigation of 125% N + 75% K	52.17
T10	Fertigation of 125% N+ 100% K	50.10
T11	Fertigaion of 125% N + 125% K	63.39
	SEm±	2.57
	C.D (P=0.05)	7.59

*****75% N = 187.5 kg N ha^{-1}, 100% N = 250 kg N ha^{-1}, 125% N = 312.5 kg N ha^{-1},
75% K = 112.5 kg K_2O ha^{-1}, 100% K = 150 kg K_2O ha^{-1}, 125% K = 187.5 kg K_2O ha^{-1},

Table 4: Effect of N and K fertigation on Oleoresin (%), Capsanthin (EOA values), Capsaicin (%) contents of red fruits at 160 DAT(final harvest) of paprika during *rabi* 2014-2015.

Treatments*		Fruit quality parameters		
		Oleoresin (%)	Capsanthin (EOA values),	Capsaicin (%)
T1	Soil application of 100% N and K + drip irrigation	6.13	12098	0.66
T2	Soil application of 100% N and K + furrow irrigation	6.70	12220	0.57
T3	Fertigation of 75% N + 75% K	6.87	11265	0.53
T4	Fertigation of 75% N+ 100% K	6.02	14803	0.76
T5	Fertigaion of 75% N + 125% K	7.35	15880	0.58
T6	Fertigation of 100% N + 75% K	5.70	13867	0.67
T7	Fertigation of 100% N+ 100% K	7.80	11814	0.42
T8	Fertigaion of 100% N + 125% K	5.43	13135	0.66
T9	Fertigation of 125% N + 75% K	7.64	12302	0.65
T10	Fertigation of 125% N+ 100% K	7.57	15799	0.66
T11	Fertigaion of 125% N + 125% K	6.13	13827	0.64
	SEm±	0.80	475	0.07
	C.D (P=0.05)	NS	NS	NS
*****75% N = 187.5 kg N ha^{-1}, 100% N = 250 kg N ha^{-1}, 125% N = 312.5 kg N ha^{-1},				
75% K = 112.5 kg K_2O ha^{-1}, 100% K = 150 kg K_2O ha^{-1}, 125% K = 187.5 kg K_2O ha^{-1},				

Conclusions

In general, non significant effect of different treatments on oleoresin content and capsaicin content of red fruits at harvest indicating that the fruit quality of paprika is more controlled by genetics than management practices. The capsanthin content was positively correlated with fruit N and K contents. Association of K nutrition with increased yields, fruit size, increased soluble solids and ascorbic acid concentrations, improved fruit color.

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