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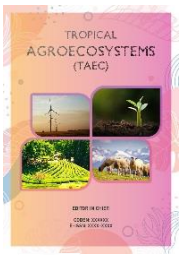

RESEARCH ARTICLE

PERFORMANCE OF CUCUMBER VARIETIES UNDER DIFFERENT NUTRIENT SOURCES IN THE RIVERBED OF KANCHANPUR DISTRICT

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ABSTRACT

A field experiment was carried out in riverbed of Kanchanpur district to know the performance of cucumber varieties under different nutrients sources. The research site was facing the problem of low productivity of cucumber due to the use of indigenous variety and traditional cultivation practices. So the research was conducted to know the best variety of cucumber with different nutrients source under riverbed condition. The research was carried out from 13th December 2016 to 15th May 2017. The soil of experimental field was sandy loam with pH 6.2. The crop geometry was 75 cm×75cm and the size of each plot was 14.0625 m^2. The research was carried out in RCBD design with 8 treatments and 3 replications. The treatment combination used for the field experiment were FYM + Ninja-179, FYM + Malini, Poultry manure + Ninja-179, Poultry manure + Malini, Oilseed cake + Ninja-179, Oilseed cake + Malini, NPK + Ninja-179 and NPK + Malini. Data were collected on the following parameters such as vine length, number of leaves, leaf length, leaf breadth, days to first flowering, days to first fruiting, days to first fruit maturity, male and female flower ratio fruit weight, fruit length, fruit diameter and fruit yield. It is revealed that the performance of different combination of treatments, NPK + Ninja-179 was found to be the best high yielding variety for this locality with yield of 68.79 ton/ha. Besides fruit yield, the treatment combination of NPK + Ninja-179 was superior to other treatment combination in others parameters like vine length(64.67 cm), number of leaves(17.93), fruit length(21.8 cm), fruit weight (535.31g) and fruit diameter(6.00 cm). The study reveals that the treatments combination of inorganic fertilizer with Ninja variety was found to be best under riverbed condition.

KEYWORDS

Ninja-179, Malini, Statistically and Treatment

1. INTRODUCTION

Cucumber (Cucumis sativus L.) is a monoecious annual crop and belongs to Cucurbitaceous family that has been cultivated by man over 3000 years ago (Adetula and Denton, 2003; Okonmah, 2011). Cucumber is fourth most important vegetable after tomato followed by cabbage and followed by onion in Asia and second most important vegetable crop after tomato in Western Europe (Talioghu, 1997; Phu, 1997). Cucumber consists of approximately 125 genera and 960 species, mainly in tropical and subtropical region (Asian Vegetable Research and Development Council, 1990). The cultivated area of cucumber in Nepal was 10812 ha with production of 172566 Mt. and productivity of 15.96 Mt/ha (SINA 2018/19).

Cucumber is a warm weather crop which is sown, grown and harvested over dry and rainy season (Hector et al., 2005). Cucumber needs temperature between 25^{0}C to 29^{0}C and plenty of sunlight (Hochmuth, 2001). Cucumber is a creeping vine that roots in the ground and grows up trellises or other supporting frames wrapping around the supports with thin spiraling tendril (Maynard et al., 2001). The plants have large leaves that forms a canopy over the fruits that is roughly cylindrical, elongated and tapered end and may be as large as 60 cm long and 10 cm in diameter (Robinson et al., 1997). Cucumber is conventionally placed into three main varieties "Slicing", "Pickling", and "Burpless" and within these varieties different cultivars have been emerged (Clark et al., 1991). Cucumber bears edible fruits when ripe and much like to tomato and squash. They are often perceived, prepared and eaten as vegetables (Jacques et al., 2002; Binder et al., 1989).

Riverbed cultivation or diara land farming is very old practices, possibly started from the Mughal period with various cucurbits of growing vegetables on the bank or basin of the rivers after the flood level is receded. As defined in the local riverbed farming policy, riverbed farming includes all the activities such as farming works, agribusiness, agroforestry business and microenterprises that are based on riverbed (Gurung et al., 2102). Due to the use of traditional cultivars and indigenous cultivation practices, cucumbers in this area are imported from neighboring country. So, to ensure optimum production by modern high yielding cultivars and to increase the socio-economic status of farmers with improved practices in this area, we had carried out this research.

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2. Material and Methods

2.1 Description of experimental site

2.1.1 Site selection

The research was conducted in Bheemdatt Municipality ward No. 03 of Kanchanpur district from 13th December 2016 to 15th May 2017 which is located at the altitude of 300 meter above the sea level with Latitude of 28°38' N and Longitude of 80°33' E. Geographically the experimental location was situated in Terai region of Sudur Paschim Province.

2.1.2 Physiochemical study of the soil

Composite soil samples were randomly take from different spot of the research plot up to 30 cm depth using soil Auger to test the physiochemical properties of the soil. The soil samples then dried, grounded and sieved through 2 mm sieve and finally tested in Regional Soil Testing laboratory, Sundarpur, Kanchanpur. The physiochemical properties of soil of research field were shown below:

Table 1: Physiochemical properties of experimental site

Properties	Average content	Scale
Physical properties		
Sand (%)	50	
Silt (%)	30	
Clay (%)	20	
Chemical properties		
Soil pH	6.2	Slightly acidic
Soil organic matter (%)	0.2	Medium
Total Nitrogen (%)	0.08	Low
Available phosphorus (kg/ha.)	2	Medium
Available potassium (kg/ha)	2.50	Medium
Texture	Sandy	

2.1.3 Sowing of seed and transplanting of seedlings

Seeds were sown in polybags of two different colors namely black and white, having compost mixed sandy loam soil on 15th December 2016 for germination and seedling raising. Total 700 poly bags were filled out of which 350 were of black color for Malini variety of cucumber and 350 were of white colors for Ninja-179 variety of cucumber. There were two holes at the lower side of the polybag for drainage of excessive water in the polybag. One seed was sown in each polybag. After sowing of seed two separate plastic houses were made for each variety to provide favorable environment for germination and polybags were kept inside them. They were regularly watered during seed raising period. Complete germination of the seeds took place within 7 days after seed sowing. Intensive care was taken for raising the seedling. When seedlings were 30 days old and attain three leaves and hard enough, they were transplanted in the main field.

2.2 Experimental details

2.2.1 Experimental treatments

The experiment was undertaken to study the effect of four levels of the nutrients source and two levels of cucumber varieties. The study comprises of with dose of nutrients like Farm yard manure (30 t/ha), Poultry Manure (10 t/ha), Oilseed cake (2.6 t/ha) and Inorganic fertilizer (137.6: 39.32: 98.3 NPK kg/ha) and varieties Ninja-179 and Malini. The major aim of the study is to find out the best variety with nutrient dose. There were eight treatment combinations of fertilizers and variety used in the experiment as follows:

Table 2: Treatment combinations

S.N.	Treatment combination	Treatment detail
1	$F_0 V_0$ (T_1)	FYM + Ninja-179
2	$F_0 V_1$ (T_2)	FYM + Malini
3	$F_1 V_0$ (T_3)	Poultry Manure + Ninja-179
4	$F_1 V_1$ (T_4)	Poultry Manure + Malini
5	$F_2 V_0$(T_5)	Oilseed cake + Ninja-179
6	$F_2 V_1$ (T_6)	Oilseed cake + Malini
7	$F_3 V_0$(T_7)	Inorganic fertilizer + Ninja-179
8	$F_3 V_1$(T_8)	Inorganic fertilizer + Malini

2.2.2 Design and layout of experimental plot

The experiment was laid out with randomized completely block design (RCBD) with three replications. The experimental plot was divided into three blocks. Each block consists of 8 units of plots. Different combination of fertilizers and varieties were used to randomly to each block as per design of the experiment. There were 24 number of plots with individual plot size of 3.75*3.75m. Spacing was maintained at 0.75*0.75m and one-meter distance was maintained between replication and 50 cm between plots, having total area of experimental site was 526.125 m^2 and individual plot was 14.0625 m^2.

2.3 Field operations

2.3.1 Land preparation

The vegetation was cleared on 12th January 2017 with the help of manually operated hand tools. Chemical weedicide (2,4-D) was applied for killing the weeds present in the research field. The research field was not ploughed but a pit of 30cm^3 was duged with spade for transplanting the seedling.

2.3.2 Transplanting of cucumber seedlings

By removing polybag, one cucumber seedling per pit was transplanted as per design on the 15th January 2017. Five sample plant were taken and tagging of these sample plants was done during transplanting. Replication number and treatment combination tags were also kept there during transplanting.

2.4 Intercultural operations

2.4.1 Weeding

Manual weeding was performed at 30 days after transplanting and 60 days after transplanting. The major weed recorded were Cyanolon dactilon, Schharum sp. and Vicia sativa.

2.4.2 Irrigation

Irrigation was given at 5 days interval.

2.4.3 Protection of experimental site

Fencing was done with the help of jute rope; iron wire and cemented poles and one security guard was kept in the site for protection and care of the plants.

2.4.4 Harvesting

Total 6 times harvesting was done. Harvesting was done at 7 days interval from every randomly selected plants that were tagged for collecting data. First harvesting was done on 80 days after transplanting i.e. 15th April 2017.

2.5 Collection of Experimental data

2.5.1 Vine length

Vine length from base to tip of the randomly selected 5 plants per plot that were tagged was measured from days at transplanting and onwards at 10 days interval and average was calculated.

2.5.2 Number of leaves

Number of green photosynthetically active leaves excluding senescent and emerging leaves per plant were counted and recorded at 10 days interval from days after transplanting and average was calculated.

2.5.3 Days to first flower initiation

Number of days from transplanting to time required to first flowering from each selected plants from each plot was counted and average was taken.

2.5.4 Number of male and female flowers

Total numbers of male and female flowers were counted from five randomly selected plants per plot. It was done at 10 days interval after first flowering to ensure all flowers to be counted.

2.5.3 Ratio of male and female flowers

Ratios of male and female flowers were calculated by dividing male flowers by female flowers and average was calculated.

2.5.4 Days to first fruit set

Number of days from transplanting to time required to first fruit set was recorded from the selected plant and average was calculated.

2.5.5 Days to first fruit maturity

Number of days from transplanting to time required to first fruit maturity was recorded from the selected plants and average was calculated.

2.5.6 Number of fruits per plant

The numbers of fruits from each randomly selected plants were counted at each harvest and thus total number of fruits per plant was recorded and average numbers of fruits were calculated.

2.5.7 Length and diameter of fruits

Length of 5 randomly selected plants fruit per plot was measured per harvest and then average was taken. A total 6 times measurement was taken during the experiment period. Diameter was taken from the same fruits and average was calculated.

2.5.8 Weight of fruit

After each harvest, the weight of randomly selected five fruits per plot was recorded and then average weight per plot was calculated.

2.5.9 Weight of fruits per plant

After each harvest, the weight of randomly selected five fruits from the selected plants was recorded and then average fruit per plant was calculated.

2.5.10 Fruit yield

To estimate the yield per hectare (t/ha), five plants in each plot and the fruits in each harvest were considered. Thus, the average yield per plot was recorded. Yield per ha. were calculated to covert considering the area covered by 5 plants.

2.5.11 Statistical analysis

The data thus collected were statistically analyzed by using ANOVA. The test of significance of all the parameters was done. The Duncan's Multiple Range Test (DMRT) with least significant difference value was determined with appropriate level of significance and the means were tabulated. The significance of the difference among the treatment combination means was estimated by DMRT at 5% Level of probability.

3. Result and Discussion

The results of research entitled, "Performance of cucumber varieties under different nutrients sources in the riverbed ok Kanchanpur district" is presented in this chapter. The effort has been made to identify the best variety and fertilizer dose to enhance the productivity of cucumber. The data recorded were analyzed and presented in tables wherever necessary and an attempt has been made to evaluate the results so obtained to provide the explanation with the available evidences wherever possible for the observed variation in the mentioned traits.

3.1 Vine length

Table 3: Effect of different nutrient sources on vine length of cucumber varieties under riverbed condition during 2017

Treatments	Vine length at transplanting	Vine length at 10 DAT	Vine length at 20 DAT	Vine length at 30 DAT	Vine length at 40 DAT	Vine length at 50 DAT	Vine length at 60 DAT
FYM + Ninja 179 (T_1)	5.13 ^{cd}	8.27 ^{a}	12.53 ^{ab}	19.27 ^{a}	26.13 ^{a}	37.60 ^{a}	49.33 ^{ab}
FYM + Malini (T_2)	4.47 ^{a}	7.47 ^{a}	11.27 ^{a}	19.60 ^{a}	28.50 ^{ab}	37.87 ^{a}	47.48 ^{a}
Poultry manure + Ninja 179 (T_3)	4.87 ^{bc}	7.73 ^{a}	11.13 ^{a}	21.53 ^{ab}	32.17 ^{bc}	42.57 ^{ab}	52.83 ^{bc}
Poultry manure + Malini (T_4)	5.20 ^{d}	7.93 ^{a}	11.27 ^{a}	22.67 ^{ab}	34.07 ^{c}	44.47 ^{b}	54.53 ^{c}
Oilseed cake + Ninja 179 (T_5)	4.60 ^{ab}	8.17 ^{a}	12.67 ^{ab}	23.47 ^{b}	33.73 ^{c}	43.93 ^{b}	53.60 ^{bc}
Oilseed cake + Malini (T_6)	5.20 ^{d}	10.27 ^{b}	14.87 ^{b}	24.0 ^{b}	33.57 ^{c}	43.47 ^{b}	54.90 ^{c}
NPK + Ninja 179 (T_7)	6.07 ^{f}	12.13 ^{c}	22.40 ^{d}	32.70 ^{c}	43.0 ^{d}	54.03 ^{c}	64.67 ^{d}
NPK + Malini (T_8)	5.73 ^{e}	11.27 ^{c}	19.87 ^{c}	30.63 ^{c}	39.13 ^{d}	51.40 ^{c}	61.33 ^{d}
Mean	5.16	9.15	14.50	24.23	33.79	44.42	54.88
LSD $_{0.05}$	0.28	0.94	2.32	3.30	4.76	5.11	3.92
CV (%)	3.10	5.90	9.10	7.80	8.0	6.60	4.10
SeM(±)	0.16	0.54	1.33	1.88	2.72	2.92	2.24

The statistical analysis for this parameter showed significant result ($P<0.05$). The highest vine length was observed from treatment combination of NPK + Ninja-179 (6.07) and lowest from treatment combination of FYM + Malini (4.47) at transplanting time. The treatments T_1, T_3 and T_5 were statistically similar and T_7 was different among Ninja-179 whereas in Malini T_4 and T_6 were similar but T_2 and T_8 were different. However, no treatment was applied at seedling raising time, this may be due to the nutrient content of soil that was filled in the poly bags.

Similarly, the treatment combination for vine length at 10 DAT also showed significant results. The highest vine length at 10 DAT was observed from treatment combination of NPK + Ninja-179 (12.13) and lowest from FYM + Malini (7.47). The treatments T_1, T_3 and T_5 were statistically at par but T_7 was different among Ninja-179 whereas in Malini T_2 and T_4 were statistically at par whereas T_6 and T_8 were different.

The treatment combination for vine length at 20 DAT showed significant result. The highest vine length was from NPK + Ninja-179 (22.40) and lowest from FYM + Malini (11.27). The treatments T_1, T_3 and T_5 were statistically similar and T_7 was different among Ninja-179 whereas in Malini T_2 and T_4 were statistically at par and T_6 and T_8 were different.

The treatment combination for vine length at 30 DAT showed significant result. The highest vine length was from NPK + Ninja-179 (32.70) and lowest from FYM + Ninja-179 (19.27). The treatments T_1, T_3 and T_5 were statistically similar and T_7 was different among Ninja-179 whereas in Malini T_2 and T_4 were statistically at par and T_6 and T_8 were different.

The treatment combination for vine length at 40 DAT showed significant result. The highest vine length was from NPK + Ninja-179 (43.0) and lowest from FYM + Ninja-179 (26.13). The treatments T_1, T_3 and T_5 were statistically similar and T_7 was different among Ninja-179 whereas in Malini T_4 and T_6 were statistically similar and T_2 and T_8 were statistically different.

The treatment combination for vine length at 50 DAT showed significant result. The highest vine length was from NPK + Ninja-179 (53.03) and lowest from FYM + Ninja-179 (37.60). The treatments T_1, T_3 and T_5 were statistically similar and T_7 was different among Ninja-179 whereas in Malini T_4 and T_6 were statistically similar and T_2 and T_8 were statistically different.

The treatment combination for vine length at 60 DAT showed significant result. The highest vine length was from NPK + Ninja-179 (64.67) and

lowest from FYM + Malini (47.48). The treatments T_1, T_3 and T_5 were statistically similar and T_7 was different among Ninja-179 whereas in Malini T_4 and T_6 were statistically similar and T_2 and T_8 were statistically different.

The results obtained from this research were supported by the following authors who conducted similar researches. Our research findings were also in line with Naeem et. al. ,2002; who reported that the different doses of NPK were significantly different from days to flowering, days to maturity, number of branches/ plant, plant height (cm), number of fruit per plant, length of fruit (cm) and total yield (kg/ha). Further our research findings were also supported by who reported that increasing the level of NPK resulted in a positive response in vegetative growth and increased yield (Abdel-Mawgoud et al., 2005).

The research conducted was also in support with our research and he the reported that 100Kh/ha had significantly maximized the cucumber length, fruit weight and vine length, which are indirectly related to the yield but 80kg/ha was the most economical dose for minimizing the days to flowering, days to fruit sett and days to fruit sett and days to fruit maturity and getting higher number of fruits and ultimately yield (Waseem et al., 2008).

3.2 Number of leaves

Table 4: Effect of different nutrient sources on number of leaves of cucumber varieties under riverbed condition during 2017

Treatments	No. of leaves at transplanting	No. of leaves at 10 DAT	No. of leaves at 20 DAT	No. of leaves at 30 DAT	No. of leaves at 40 DAT	No. of leaves at 50 DAT	No. of leaves at 60 DAT
FYM + Ninja 179 (T_1)	2.93 ^{a}	4.86 ^{ab}	6.66 ^{a}	8.06 ^{a}	9.6 ^{a}	11.47 ^{ab}	13.67 ^{a}
FYM + Malini (T_2)	2.5 ^{a}	4.26 a	6.13 ^{a}	7.66 ^{a}	9.4 ^{a}	11.33 ^{ab}	14.07 ^{a}
Poultry manure + Ninja 179 (T_3)	2.8 ^{a}	4.53 ^{ab}	6.6 ^{a}	8.33 ^{a}	10 ^{a}	12 ^{abc}	14 ^{a}
Poultry manure + Malini (T_4)	2.73 ^{a}	4.6 ^{a}	6.46 ^{a}	8.4 ^{a}	10.2 ^{a}	12.33 ^{bc}	14.07 ^{a}
Oilseed cake + Ninja 179 (T_5)	2.6 ^{a}	4.46 ^{ab}	6.2 a	8 ^{a}	9.8 ^{a}	11.67 ^{abc}	13.6 ^{a}
Oilseed cake + Malini (T_6)	2.33 ^{a}	4.2 ^{a}	6.4 ^{a}	7.86 ^{a}	9.53 ^{a}	11.2 ^{a}	13 ^{a}
NPK + Ninja 179 (T_7)	2.4 ^{a}	5.13 ^{b}	9.46 ^{b}	12.53 ^{b}	14.8 ^{b}	16.47 ^{d}	17.93 ^{b}
NPK + Malini (T_8)	2.4 ^{a}	4.26 ^{a}	6 ^{a}	7.86 ^{a}	10 ^{a}	12.63 ^{c}	14.33 ^{a}
Mean	2.59	4.54	6.74	8.59	10.42	12.39	14.37
$LSD_{0.05}$	0.69	0.61	0.72	0.81	0.87	0.97	1.33
CV (%)	15.4	7.7	6.2	5.4	4.8	4.5	5.5
SeM(±)	0.39	0.35	0.41	0.46	0.49	0.55	0.78

The statistical analysis for number of leaves at transplanting time showed significant result ($P<0.05$). The highest numbers of leaves at transplanting were observed from treatment combination of FYM + Ninja-179 (2.93) and lowest from treatment combination of Oilseed cake +Ninja-179 (2.33) at transplanting time. The treatments T_1, T_3, T_5 and T_7 were statistically similar Ninja-179 whereas in Malini T_2, T_4, T_6 and T_8 were statistically similar. Since no treatment was applied at seedling raising time, this may be due to the nutrient content of soil that was filled in the poly bags.

The treatment combination for number of leaves at 10 DAT showed significant result. The highest number of leaves was found from NPK + Ninja-179 (5.13) and lowest from Oilseed cake + Malini (4.12). The treatments T_1, T_3, T_5 and T_7 were statistically similar Ninja-179 whereas in Malini T_2, T_4, T_6 and T_8 were statistically similar.

The treatment combination for number of leaves at 20 DAT showed significant result. The highest number of leaves was found from NPK + Ninja-179 (9.46) and lowest from FYM + Malini (6.13). The treatments T_1, T_3 and T_5 were statistically similar but T_7 was different Ninja-179 whereas in Malini T_2, T_4, T_6 and T_8 were statistically similar.

The treatment combination for number of leaves at 30 DAT showed significant result. The highest number of leaves was found from NPK + Ninja-179 (12.53) and lowest from FYM+ Malini (7.66). The treatments T_1, T_3 and T_5 were statistically similar but T_7 was different Ninja-179 whereas in Malini T_2, T_4, T_6 and T_8 were statistically similar.

The treatment combination for number of leaves at 40 DAT showed significant result. The highest number of leaves was found from NPK + Ninja-179 (14.8) and lowest from FYM+ Malini (9.4). The treatments T_1, T_3 and T_5were statistically similar but T_7 was different Ninja-179 whereas in Malini T_2, T_4, T_6 and T_8 were statistically similar.

The treatment combination for number of leaves at 50 DAT showed significant result. The highest number of leaves was found from NPK + Ninja-179 (16.47) and lowest from FYM+ Malini (11.83). The treatments T_1, T_3 and T_5 were statistically similar but T_7 was different Ninja-179 whereas in Malini T_2, T_4, T_6 and T_8 were statistically similar.

The treatment combination for number of leaves at 60 DAT showed significant result. The highest number of leaves was found from NPK + Ninja-179 (17.93) and lowest from FYM+ Malini (13.0). The treatments T_1, T_3 and T_5were statistically similar but T_7 was different Ninja-179 whereas in Malini T_2, T_4, T_6 and T_8 were statistically similar.

FYM could not support the growth of cucumber, probably the nutrient of soil was below the critical level. Hence it gives poor performance. This means that higher nutrient applied in soil, the higher number of leaves per plant. Thus, our result agrees with some studies (Aduloju et al., 2010; Dada et al., 2010).

3.3 Days to first flowering, fruit set, fruit maturity and male female flower ratio

Table 5: Effect of different nutrient sources on reproductive parameters of cucumber varieties under riverbed condition during 2017

Treatment	Days to first flowering	Days to first fruit set	Days to first fruit maturity	Male and female flower ratio
FYM + Ninja 179 (T_1)	66.93^{a}	69.6 ^{a}	73.53 ^{a}	5.34 ^{c}
FYM + Malini (T_2)	67.67 ^{a}	70.67^{a}	74.67 ^{a}	4.70 ^{c}
Poultry manure + Ninja 179 (T_3)	75.87^{b}	79.4^{b}	83.4 ^{b}	4.37 ^{bc}
Poultry manure + Malini (T_4)	77^{b}	80.73 ^{b}	84.7 ^{b}	3.58 ^{abc}
Oilseed cake + Ninja 179 (T_5)	84^{c}	88 ^{c}	91.2 ^{c}	3.84 ^{abc}
Oilseed cake + Malini (T_6)	87.2^{d}	91.07^{d}	95.07^{d}	4.66^{c}
NPK + Ninja 179 (T_7)	95.77^{e}	101.1^{e}	106.37^{e}	2.43^{a}
NPK + Malini (T_8)	94.07^{e}	99.4^{e}	104.73^{e}	2.55^{ab}
Mean	81.06	85	89.21	3.39
$LSD_{0.05}$	2.80	2.87	2.79	1.71
CV (%)	2	1.9	1.80	24.9
SeM(±)	1.6	1.64	1.60	0.99

3.3.1 Days to first flowering

The statistical analysis for days to first flowering showed significant result (P<0.05). The highest days to first flowering was observed from NPK + Ninja-179 (95.77) and lowest from FYM + Ninja-179 (66.93). The treatments T_1, T_3, T_5 and T_7 statistically different in ninja-179 and T_2, T_4, T_6 and T_8 were statistically different in Maini variety.

3.3.2 Days to first fruit set

The statistical analysis for days to first fruit set showed significant result (P<0.05). The highest days to first fruit set was observed from NPK + Ninja-179 (101.1) and lowest from FYM + Ninja-179 (69.6). The treatments T_1, T_3, T_5 and T_7 statistically different in ninja-179 and T_2, T_4, T_6 and T_8 were statistically different in Maini variety.

3.3.3 Days to first fruit maturity

The statistical analysis for days to first fruit maturity showed significant result (P<0.05). The highest days to first fruit set was observed from NPK + Ninja-179 (106.37) and lowest from FYM + Ninja-179 (73.53). The treatments T_1, T_3, T_5 and T_7 statistically different in ninja-179 and T_2, T_4, T_6 and T_8 were statistically different in Maini variety.

3.3.4 Male and female flower ratio

The statistical analysis for male and female flower ratio showed significant result (P<0.05). The male and female flower ratio was observed from FYM + Ninja-179 (5.34) and lowest from NPK + Ninja-179 (2.43). The treatments T_3 and T_5 were statistically at par but T_1 and T_7 were statistically different in Ninja-179 but in Malini T_2, T_4, T_6 and T_8 were statistically different in Maini variety.

Our research was in line with the research of who reported that effect of varying level of NPK on reproductive parameters and N level had significant effect on flower initiation, fruit set and male and female flower ratio during 2001 and 2002 (Umamaheswarappa et al., 2005). Similarly, research of Arora and Siyeg observed N and P increase the number of female flowers which coincide with our research (Arora and Siyeg, 1989).

3.4 Fruit weight, length and diameter

Table 6: Effect of different nutrient sources on yield attributing parameters of cucumber varieties under riverbed condition during 2017

Treatments	Fruit weight, g	Fruit length, cm	Fruit diameter, cm
FYM + Ninja 179 (T_1)	223.3 [a]	6.2[a]	2.47 [a]
FYM + Malini (T_2)	239.1 [a]	7.47[a]	2.85 [a]
Poultry manure + Ninja 179 (T_3)	291.3 [b]	10.93[b]	4.32 [b]
Poultry manure + Malini (T_4)	308.9 [b]	13.13[c]	4.51 [b]
Oilseed cake + Ninja 179 (T_5)	369 [c]	15.6[d]	4.79 [b]
Oilseed cake + Malini (T_6)	413.7 [d]	17.07[d]	4.92 [bc]
NPK + Ninja 179 (T_7)	535.3 [f]	21.8[e]	6.00[d]
NPK + Malini (T_8)	490.3 [e]	20.93[e]	5.61[cd]
Mean	358.9	14.14	4.43
$LSD_{0.05}$	27.6	2.07	0.74
CV (%)	4.4	8.4	9.50
SeM(±)	5.76	1.84	0.42

The statistical analysis for fruit weight showed significant result (P<0.05). The highest fruit weight was observed from NPK + Ninja-179 (535.3) and lowest from FYM + Ninja-179 (233.3). The treatments T_1, T_3, T_5 and T_7 statistically different in ninja-179 and T_2, T_4, T_6 and T_8 were statistically different in Maini variety.

The statistical analysis for fruit length showed significant result (P<0.05). The highest fruit length was observed from NPK + Ninja-179 (21.8) and lowest from FYM + Ninja-179 (6.2). The treatments T_1, T_3, T_5 and T_7 statistically different in ninja-179 and T_2, T_4, T_6 and T_8 were statistically different in Maini variety.

The statistical analysis for fruit diameter showed significant result (P<0.05). The highest fruit diameter was observed from NPK + Ninja-179 (6.0) and lowest from FYM + Ninja-179 (2.47). The treatments T_3 and T_5 were statistically at par but T_1 and T_7 were statistically different in Ninja-179 but in Malini T_2 was different from T_4, T_6 and T_8.

Our research finding was in line with Ahmed et. al.,2007 who conducted similar research and reported that an increase in nitrogen application resulted in the maximum application resulted in maximum fruit length, fruit weight, vine length and yield of cucumber. An increase in the quality of nitrogen sources applied equally led to a significant increase in fruit length per plant. These results agree with previous report (Ayoola and Adediran, 2006).

More quality of nutrients supplied in the treatment, the more increase in the size of fruit diameter per plant. However, the less quantity of nutrient supplied in a treatment, the less quantity of nutrient supplied in a treatment the less significant increase in the size of the fruit diameter per plant as observed which also coincide with our research (Ayoola and Adediran, 2006).

3.5 Yield

Table 7: Effect of different nutrient sources on yield of cucumber varieties under riverbed condition during 2017

Treatment	Yield per hectare, (t/ha.)
FYM + Ninja 179 (T_1)	20.740 [a]
FYM + Malini (T_2)	18.844 [a]
Poultry manure + Ninja 179 (T_3)	36.147 [b]
Poultry manure + Malini (T_4)	38.161[b]
Oilseed cake + Ninja 179 (T_5)	53.864[c]
Oilseed cake + Malini (T_6)	51.553[c]
NPK + Ninja 179 (T_7)	68.797[e]
NPK + Malini (T_8)	59.257[d]
Mean	43.420
$LSD_{0.05}$	41.01
CV (%)	5.4
SeM(±)	23.15

The statistical analysis for yield per ha. showed significant result (P<0.05). The highest fruit yield per ha. was observed from NPK + Ninja-179 (68.79) and lowest from FYM + Malini (18.84). The treatments T_1, T_3, T_5 and T_7 statistically different in ninja-179 and T_2, T_4, T_6 and T_8 were statistically different in Maini variety. Our research finding was in line with Zambrano et.al. (2002) who reported that there were negative effect of lower dose of fertilizer in growth and yield parameters. Further this findings was supported by who reported that the growth and yield attributes increases with increase in the inorganic fertilizer (Eifediyi and Samaon, 2009).

4. Conclusion

Out of the 8-treatment combination NPK + Ninja-179 gave the maximum yield (68.79 ton/ha.) and minimum from treatment combination of FYM + Ninja-179 (20.74 ton/ha.). Similarly, highest vine length was observed

from the treatment combination of NPK + Ninja-179 (64.67 cm) and lowest from FYM + Malini (47.48 cm). The highest numbers of leaves were observed from NPK + Ninja-179 (17.93 cm) and lowest from oilseed cake + Malini (13 cm). Similarly days to first flowering, days to first fruit set, days to first fruit maturity fruit weight, fruit length and fruit diameter were highest from treatment combination of NPK + Ninja-179 (95.77, 101.1, 106.37,535.3 g, 21.8 cm and 6.0 cm) and lowest from treatment combination of FYM + Ninja-179 (66.93, 69.6, 73.53, 223.3g, 6.2 cm and 2.47) respectively. Similarly, highest male and female flower ratio was obtained from treatment combination of FYM + Ninja-179 (5.34) and lowest from NPK + Ninja-179 (2.43). Thus, by observing all the parameter and the growth performance of a different combination of in river bed of Kanchanpur, it is concluded that the treatment combination of NPK + Ninja-179 showed the better performance with yield of 68.79 ton/ha than others under riverbed condition.

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