Effect of age of seedling on bolting and yield of rabi onion Cv. NHRDF Red-3

Abstract: Onion is one of the most important bulb crop of Nalanda district.The trial is conducted to reduce the bolting percentage and improve the yield by transplanting of onion seedlings at proper age.Farmers are usullay transplanting 75 to 80 days old seedlings in Nalanda district. In this trail farmers are transplanted 60 days and 55 days old seedlings for conscecutive two financial year 2018-2019 and 2019-2020. The best result was obtained in case of transplanting of 55 days old seedlings.The maximum bulb weight 58.86 gm, minimum bolting percentage 1.98%, maximum yield 324.63 q/ha with highest B:C ratio 02.08 was recorded in Year 2018-2019 in case of 55 days of seedlings.The similar result was obtained in year 2019-2020 as highest bulb weight 61.01 gm, least bolting percentage 1.98%,maximum yield 325.25q/ha with highest B:C ratio 2.10 as compared to transplanting of 60 days old seedlings and farmers practice. In case of farmers practice the average bulb weight was 57.45gm with bolting percentage of 6.74%,yield is 297.28 q/ha with B:C ratio of 1.77 in Year 2018-19 and 57.66 gm of bulb weight, 6.53% of bolting,296.56 q/ha of yield with B:C ratio of 1.76.

Key words: Onion,Bolting,Percentage,Yield,Seedling age,transplanting.

Introduction: India is the second largest producer of onion in the world. It is one of the most important bulb and spice crop with botanical name of Allium cepa L. and belongs to family Alliaceae. It is herbaceous, monocotyledonous and cross pollinated crop belongs to geneus Allium[1]. It has production of 2311.14 thousand metric tonnes in year 2018-2019 and 2379.66 thousand metric tonnes in Year 2019-2020(Source:Horticulture Statistics Division,Department of Agriculture,cooperation and farmers welfare,GOI,New Delhi). The quality of Indian onions are appreciable for its pungency and its avilability around the year. It has hollow, narrow leaves and base portion of it enlarges to form a bulb.It requires 80 to 150 days to harvest. It is tempreate crop but can grow in diverse climatic conditions such as tropical,subtropical and temprate climate. The most suitable climate is mild weather without extrems of cold and hot. The optimum temprature required for vegetative growth is 13 to 24 degree celsius and for bulb devlopment around 16 to 25 degree celsius. It can be grown in all types of soil but best soil for its cultivation is friable loam and alluvial soils with good drainage, moisture holding capacity and sufficient organic matter.It can be grow well in heavy soil with proper field prepration such as application of FYM or orgenic manure in sufficient quantity. The optimum pH range for its cultivation is 6 to 7.5. Onion is cultivated from transplants,seed,sets for use as green onions as well as dry onions[2]. It gives pungent order while crushing[3].

Nursery raising in onion and its management is one of the very important operation for getting quality bulb and higher yield. For transplanting of one hectare area about 0.05 hectare area is

used for nursery bed. The raised brds are prepared for good growth of seedling.Apply around half tons of well decomposed FYM in soil before preparing bed. The raised bed of 12-15 cm height with 1 to 1.2 meter weidth is prepared. The length of the bed can be increased or decreased as per requirement. The distance between two beds should be maintained properly for removal of excess water. For controlling the weeds in nursery spraying of 0.2% pendimethalin as pre emergence herbicide. The seed rate is 5 to 7 kg for one hectare. Before sowing of seed it must be treated with fungicide or Trichoderma for controlling damping off disease and raising healthy seedlings.

Onion is very good for health. It is rich source of vitamins, minerals and have different medicinal values. Its bulbs are widly used in vegetables, raw consumption, used as spices for culinary purpose etc. Since ancient times it were widely used to treat health ailments like mouth sores, heart diseases and headaches. It is also called as nutrient dense it means it is high in vitamins and minerals and low in calories. It is rich in vitamin C. It helps in iron absorption ,tissue repair and immune health. It is also strong antioxidant. It protects our cells from free radicals. It is good source of potassium, vitamin B9 and B6. It plays major role in metabolism, nerve function,etc.

Materials and methodes:

This On-farm trial is conducted in different villages of Nalanda district. It is one among most important district of Bihar.This district is known as land of knowledge. The latitude of the district is 25.122265 and longitude is 85.456177.It is situated in the Magadh region of southern Bihar[4]. This district have total geographical of 2355 square kilometers[5].Out of this cutivable land occupies 181130 ha. Most of land in the district is fertile land of Indo Gangetic plane. Major soil type of the district is sandy loam to clay loam.The soil testing of experimental plots were done. We got the initial value as pH varies in range of 7.25 to 7.37,EC from 0.026 to 0.033dS/m,organic from 0.565 to 0.596 Avilable nitrogen from 242.6 to 248.5 kg/ha, Avilable P_2O_5 from 27.25 to 32.32 kg/ha and Avilable K_2O from 150.5 to 158.5 kg/ha. This trail is conducted on ten farmers field during year 2018-2019 and 2019-2020. The experiment is conducted in Randomised block design. The number of treatments were three including farmers practice.The farmers are doing transplanting of seventy five days old seedlings. In other treatments we used transplanting of sixty days and fiftyfive days old seedlings. We got best findings in transplanting of fifty five old seedlings as mentioned in table number one and two.We got the data of rainfall for year 2018,2019 and 2020. We found that there is deficit in rainfall in year 2018 and 2019 with 697.2 mm and 931.3mm. There is excess rainfall in year 2020 with 1100 mm. The optimum level of rainfall in the disrtict is 977.9 mm(Source:DAO Office,Bihar Sharif,Nalanda).

Table No:1 Average rainfall data of FY-2018,2019 and 2020.

Sr No.	Name of	Normal	2018	2019	2020

	month	rainfall (mm)			
1	January	14.5	0	8.98	10.72
2	February	13.6	1.96	16.65	17.46
3	March	8.7	0	3.09	56.30
4	April	8.7	12.99	3.66	31.39
5	May	22.6	14.29	30.03	62.16
6	June	127.7	73.50	38.54	205.37
7	July	252.8	299.32	232.54	215.11
8	August	282.7	173.36	149.92	189.03
9	September	188.6	102.2	409.32	287.36
10	October	47.4	14.6	11.2	24.32
11	November	8	0	0	0.91
12	December	2.6	4.98	27.37	0
Total		977.9	697.2	931.3	1100

Source:DAO Office Bihar Sharif,Nalanda.

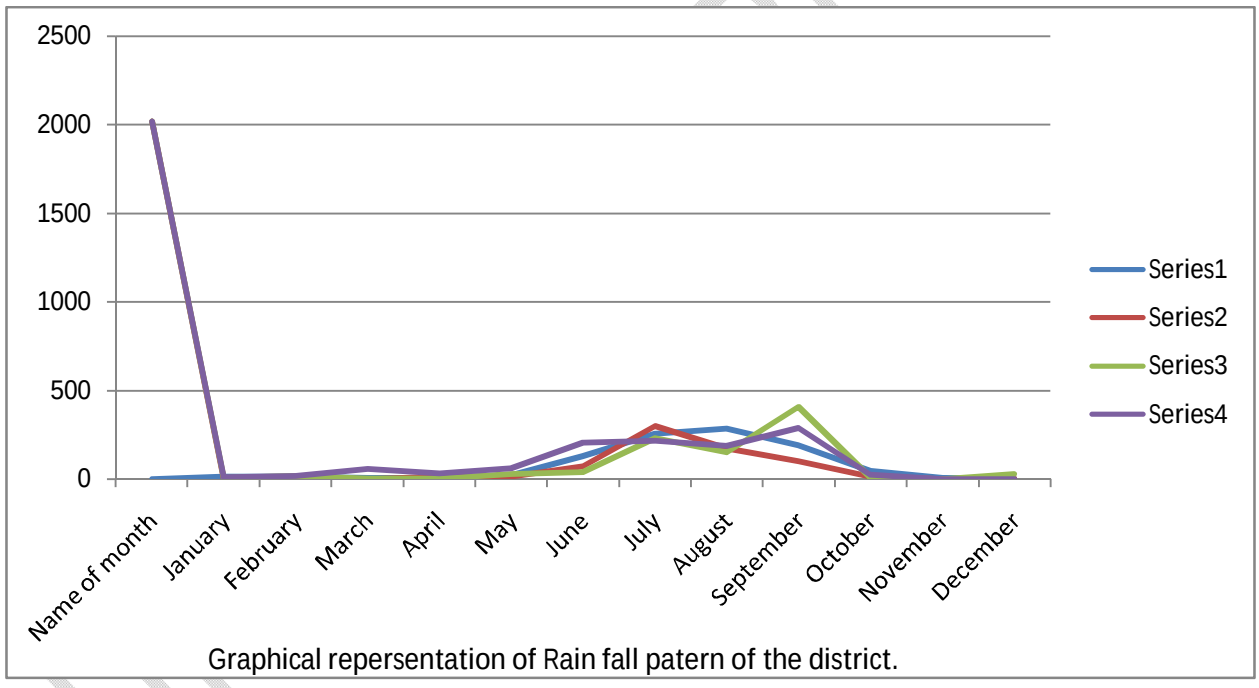

Fig 1: Graphical repersentation of Rain fall patern of the district

Results and discussions:

The maximum plant height 64.72 cm,neck thickness 1.47cm, Bulb weight 58.86 gm and yield 324.63 q/ha with minimum bolting percentage 1.98 is recorded in case of transplanting of 55 days old seedlings instead of 60 and 75 days old seedlings transplanted by farmers in financial year 2018-2019. In financial year 2019-2020 we got the similar findings as maximum plant height 63.85 cm,neck thicness 1.43 cm,bulb weight 61.01 gm,yield 325.55q/ha with minimum

bolting percentage as 1.98% is recorded in case of transplanting of 55 days old seedlings. The similar result was also recorded by [6] in case of transplanting of 8 weeks old seedlings. The similar findings was also reported by Bahadur and singh[7-8]. As per findings of [9] the maximum bulb yield was recorded in case of transplanting of eight weeks old seedlings.[10-11] also reported that the eight week old age seedlings matures at early stage as compared to other seedlings. The similar result was also reported by [12]. The maximum plant height 59.30 cm was recorded by [9] in case of transplanting of eight week old seedlings. [11] also reported maximum plant height in eight week old seedlings. The similar result was also recorded by [13]. As per findings of [14] recorded the maximum height and bulb yield in case of eight weeks transplanted seedlings.

Table- 2: Effect of age of seedlings on bolting and yield of Onion Cv.NHRDF Red-3 FY-2018-2019

Treatments	Plant height (cm)	Neck thickness(cm)	Bulb weight(gm)	Affected bolting plant percentage	Yield (q/ha)
Farmers practiceTransplanting of 75 days old seedlings	61.09	1.01	57.45	6.74	297.28
Transplanting of 60 days old seedlings	62.93	1.13	58.71	5.52	306.47
Transplanting of 55 days old seedlings	64.72	1.47	58.86	1.98	324.63
S.Em.+ C.D.@5%	0.65 1.365	0.026 0.055	0.260 0.546	0.037 0.079	0.933 1.961

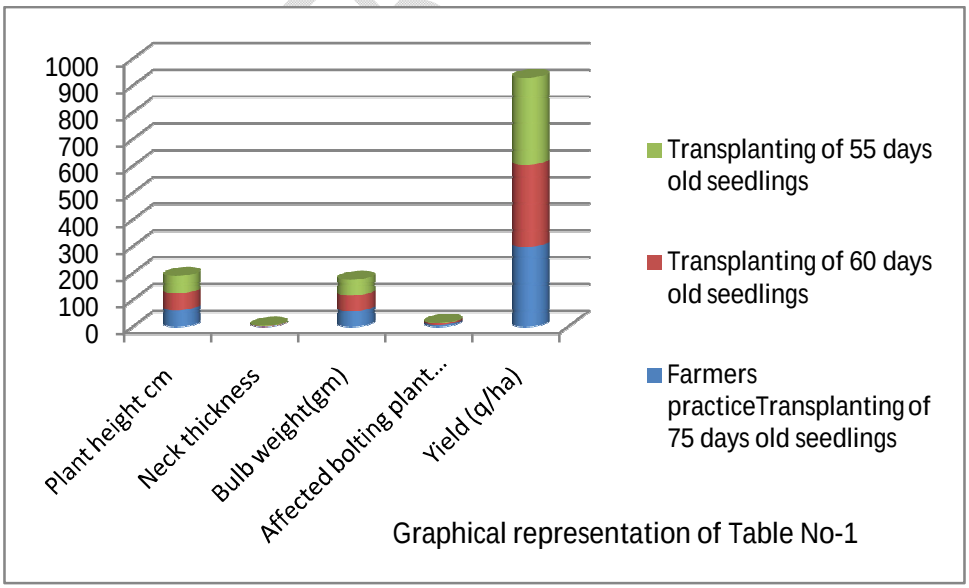

Fig 2 Graphical representation of Table No-1

Table- 3: Effect of age of seedlings on bolting and yield of Onion Cv.NHRDF Red-3 FY-2019-2020

Treatments	Plant height (cm)	Neck thickness (cm)	Bulb weight(gm)	Affected bolting plant percentage	Yield (q/ha)
Farmers practiceTransplanting of 75 days old seedlings	61.73	1.02	57.66	6.53	296.56
Transplanting of 60 days old seedlings	62.93	1.13	59.99	5.27	307.38
Transplanting of 55 days old seedlings	63.85	1.43	61.01	1.98	325.55
S.Em.+ C.D.@5%	0.65 1.365	0.025 0.053	0.338 0.711	0.096 0.202	1.010 2.122

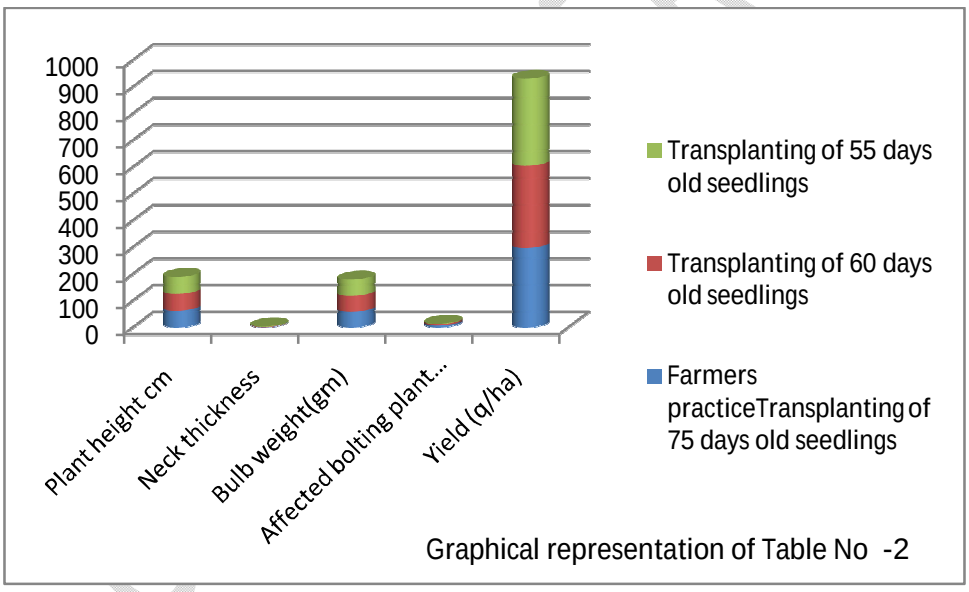

Fig 3: Graphical representation of Table No -2

Conclusion:On the findings of this trial we can conclud that the transplanting of 55 days old seedlings is best for getting quality onion bulb with optimum yield as compared to transplanting of 60 days and 75 days old seedlings.

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