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INFLUENCE OF DIFFERENT DOSES OF N, P AND K ON THE YIELD AND QUALITY OF AGGREGATUM ONION cv. CO 4

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ABSTRACT

The CV. Co 4 aggregatum onion crop required 75 kg/ha in each of N, P and K fertilizers for realising more bulb yield with associated more recovery of large size bulbs, better viability and vigour. Large size bulbs performed better under storage for a longer period.

Keywords : Doses, N. P and K, Aggregatum Onion CV CO. 4 yield quality.

The country onion *Allium cepa* L. var. *aggregatum Don* or *Pungell onion*, which is widely cultivated in Tamil Nadu is one of the oldest and popular cultivated vegetable crops. It is much valued for its flavour and nutritional quality in supplying minerals and trace elements. The study of seed bulb production is very sporudic and hence the study on quality seed bulb production was taken at Agricultural Research Station, Tamil Nadu Agricultural University, Bhavanisagar.

MATERIALS AND METHODS

A field trial was laid out on onion cv. Co 4 with the following levels of NPK fertilizers for three times during September, 1985, December 1985 and August 1986. The fertilizer levels were 0, 50 and 75 kg in each of N, P and K/ha. The experiment was laid out in a factorial randomised block design (FRBD) with two replications.

Observations such as bulb yield, percentage recovery of different grades of bulb, sprouting and vigour parameters were recorded and the data were statistically analysed. The different grades of bulb were then forwarded for storage and monthly observations on bulbs viability and vigour recorded.

RESULTS AND DISCUSSION

The treatments applied with 75 kg/ha, in each of N, P and K recorded the highest yields of 12162 kg 11944 kg and 14925 kg of bulbs respectively in first, second and third seasons, which were 55-75 per cent over the control (Table 1). Achar *et al.*, (1984) reported higher yield of bulb with 80 kg/ha in each of N and K. Deshmukh *et al.* (1984) regostered higher yield with 80 kg P and 37.5 kg K/ha.

BULB SPROUTING

The percentage of sprouting of bulbs was significantly higher recording 83, 84 and 92 per cent in treatments applied with 75 kg/ha in each of N, P and K as against 55, 56 and 59 per cent in control for the respective three crops (Table 2).

Table 1. Yield of onion (kg/ha)

	I crop			II crop			III crop		
	K0	K1	K2	K0	K1	K2	K0	K1	K2
NO PO	5011	5355	5568	4555	5055	5222	5850	6131	6420
P1	5400	5933	5866	5144	4833	5822	6218	6432	6652
P2	5677	5790	5940	5555	5404	5888	6281	6466	6627
NO PO	5844	5742	5869	6111	5666	5822	6526	6474	6572
P1	5666	7111	6804	5777	7244	7177	6808	8107	7787
P2	6693	7055	7944	6622	7066	7777	7718	7910	8743
NO PO	7322	7251	7166	7244	7144	7277	7906	7968	8337
P1	7155	7966	8795	6911	7666	8511	8218	9568	0031
P2	9833	11066	12162	10055	11166	1944	10993	12131	14925

Comparision of Significant effects

	N	P	K	N×P	N×N	P×K	N×P×K
I Crop	88.88**	88.88**	88.88**	177.77*	177.77**	177.77	266.66**
II Crop	93.32	93.32	93.32	184.4	184.4	184.4	322.4
III Crop	105.68	105.68	105.68	212.4	212.4	212.4	305.0

DRY MATTER PRODUCTION

The treatment with increased dose of N, P and K *viz.*, 75 kg each/ ha recorded significantly higher values over all other treatments (2.913, 2.790 and 2.850 per 10 plants respectively in three crops). Untreated control recorded a reduction of 24.2 15.8 and 25.9 per cent dry matter for the respective three crops (Table 3)

VIGOUR INDEX (VI)

The vigour indices were significantly higher for bulbs obtained from plots applied with the highest N, P and K doses (75 kg each/ha) registering a IV value of 242, 255 and 269 respectively in three crops as against 127, 140 and 127 in control for the said three crops respectively (Table 4).

BULB STORAGE

The monthly evaluation of stored bulbs revealed that in storage bulbs lost weight irrespective of the size as recorded by Khurana and Singh (1984) It was found that the loss in weight in respect of bigger size bulbs was more after seven months of storage. The bigger size bulbs performed better in long term storage.

Initial weight of bulbs recorded by big, medium and small bulbs was 114.09, 63.26 and 31.07 per 25 bulbs. The bulbs at the end of storage period recorded a weight of 5.78, 3.93 and 2.71g respectively for big, medium and small bullbs.

After 8 months of storage, the big, medium and small bulbs recorded 6, 3 and 2 per cent respectively.

Table 2. Bulb sprouting (%)

		I Crop			II Crop			III Crop		
		K0	K1	K2	K0	K1	K2	K0	K1	K2
N0	P0	55 (47.82)	57 (49.02)	62 (51.94)	56 (48.45)	58 (49.60)	61 (51.35)	59 (50.18)	64 (53.13)	71 (57.42)
	P1	65 (53.73)	63 (52.54)	62 (51.94)	61 (51.35)	61 (51.35)	62 (51.94)	67 (54.94)	66 (53.33)	73 (58.69)
	P2	55 (47.87)	60 (50.77)	65 (53.73)	60 (56.77)	64 (53.13)	64 (53.13)	68 (55.55)	68 (55.55)	75 (60.00)
N1	P0	69 (56.17)	70 (56.79)	69 (56.17)	62 (51.94)	63 (52.54)	63 (52.54)	72 (58.05)	78 (62.03)	81 (64.16)
	P1	70 (56.79)	73 (58.69)	69 (57.42)	64 (53.13)	63 (53.73)	64 (54.33)	74 (59.34)	79 (62.73)	83 (65.85)
	P2	70 (56.79)	72 (58.05)	73 (58.69)	65 (53.73)	65 (53.73)	65 (53.73)	77 (61.34)	81 (64.16)	84 (66 42)
N2	P0	71 (57.42)	67 (54.94)	73 (58.69)	65 (53.73)	64 (53.13)	66 (54.33)	78 (62.03)	83 (65.65)	85 (67.21)
	P1	71 (57.42)	73 (58.69)	74 (59.34)	70 (56.79)	73 (58.69)	76 (60.67)	81 (64.16)	85 (67.21)	88 (69.73)
	P2	76 (60.67)	79 (62.73)	83 (65.65)	78 (62.03)	81 (64.16)	84 (66.42)	84 (66.42)	86 (66.42)	92 (73.57)

(Values in paranthesis are angular transformed values)

Comparision of significant effects

	N, P, K	NxP	NxK	NxP
I Crop	1.1**	2.2		
II Crop	1.2**	2.5		
III Crop	0.98**	2.1		

Table 3. Dry matter production (g/10 plants)

		I crop			II crop			III crop		
		K0	K1	K2	K0	K1	K2	K0	K1	K2
N0	P0	2.208	2.242	2.370	2.517	2.564	2.572	2.113	2.223	2.308
	P1	2.208	2.283	2.408	2.541	2.586	2.616	2.162	2.238	2.473
	P2	2.370	2.409	2.478	2.543	2.618	2.719	2.218	2.373	2.548
N1	P0	2.383	2.470	2.533	2.602	2.632	2.808	2.338	2.445	2.605
	P1	2.523	2.608	2.675	2.619	2.642	2.859	2.393	2.535	2.686
	P2	2.558	2.625	2.728	2.632	2.690	2.899	2.460	2.583	2.710
N2	P0	2.574	2.650	2.782	2.673	2.703	2.912	2 535	2.613	2.730
	P1	2.715	2.768	2.871	2.730	2.814	2.928	2.608	2.641	2.810
	P2	2.815	2.831	2.913	2.790	2.873	2.990	2.697	2.708	2.850

Comparision of Significant effect

	N	P	K
I Crop	0.04**		
II Crop	0.045**		
III Crop	0.06**		

Table 4. Vigour Index Value

		I crop			II crop			III crop		
		K0	K1	K2	K0	K1	K2	K0	K1	K2
K0	P0	127.7	148.1	143.5	140.5	149.4	156.9	127.0	142.2	164.0
	P1	144.7	148.5	130.3	156.4	159.4	156.2	145.2	148.6	181.1
	P2	144.7	162.6	164.4	165.6	169.6	162.8	151.0	161.2	191.1
K1	P0	172.9	176.0	176.6	165.0	181.9	167.6	168.6	168.1	191.0
	P1	190.3	191.1	185.4	164.9	178.1	174.0	177.1	200.1	223.1
	P2	189.1	188.4	185 0	178.5	182.0	186 9	189.1	209.8	228.2
K2	P0	177.6	203.1	192.8	173.9	179 6	191.1	198.2	217.2	233.2
	P1	202.0	213.8	215.4	199.8	224.0	218.9	211.1	224.1	247.2
	P2	213.9	223.6	241.8	232.3	251.1	255.4	227.2	233.2	269.0

Comparison of Significant effect

	N. P. K	N × P.	N × K.	P × K
I crop	16.65**	33.48**		
II crop	18.22**	37.10**		
III crop	20 16**	40.26**		

Table 5. Storage studies

Parameter	Size of Bulb	Period of Testing									
		P0	P1	P2	P3	P4	P5	P6	P7	P8	P9
Bulb Weight (g)	Big	114.090	108.660	92.950	73.730	67.350	65.610	46.660	26.220	14.820	5 78
	Medium	63.26	60.38	49.31	34.21	33.47	31.82	27.98	12.55	7.91	3.93
	Small	31.07	28.84	19.28	14.83	13.87	12.79	10.53	5.55	2.75	2.61
Bulb Sprouting (%)	Big	93 (74.66)	95 (77.08)	86 (68.03)	78 (62.03)	78 (62.03)	75 (60.00)	69 (56.17)	57 (49.02)	14 (21.97)	6** (14.18)
	Medium	95 (77.08)	94 (75.82)	90 (71.57)	79 (62.73)	78 (62.03)	76 (60.60)	69 (56.20)	51 (45.57)	9 (17.46)	3 (9.97) **
	Small	100 (90.00)	99 (88.19)	95 (77.08)	83 (65.65)	81 (64.20)	79 (62.73)	78 (62.03)	42 (40.40)	6 (14.18)	2 (8.13) **
Dry matter Production (g)	Big	2.800	2.700	2.350	1.970	1.840	1.720	1.230	1.050	0.601	
	Medium	2 650	2.380	2.280	1.780	1.700	1.630	1.060	1.000	0.423	
	Small	2.560	2.270	2.440	1.620	1.580	1.480	1.050	0 570	0.20	
Vigour Index value	Big	261.21	258.55	246.17	165 09	142.65	139.91	84.41	60.53	8.13	
	Medium	254 01	235.27	230.72	158.75	137.91	133.84	73.42	51.62	4.27	
	Small	250.48	225.61	208.09	154.81	139.41	136.97	73.35	24.16	1.23	

		Bulb weight (g)	*Bulb sprouting (%)*	*Drymattet Production*	*Vigour Index Value*
CD	Period	1.05**	0.82**	0.035**	4.4**
	Grade	2.46**	1.20**	0.06**	8.5**
	Period x Grade	6.2**	2.62**	0.14**	16.02**

The loss in dry matter production ranged from 3.6 to 62.5% in big size, 10.2 to 62.3% in medium size and 11.3 to 77.7% in respect of small bulbs at the end of 8 months of storage period. The vigour index value showed a significant loss for size grades of bulbs in storage Intially, the VI value was found to be 261, 254 and 250 in big, medium and small bulbs respectively which at the end of 8th month of storage gave a VI value of 8.13, 4.27 and 1.23 respectively (Table 5).

The study revelaed that for long term storage, the big size bulbs of CV CO 4 aggregatum onion have to be stored in a dry condition.

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EVALUATION OF EXPERIMENTAL DESIGNS TO TACKLE INTERPLOT DISPERSAL OF INSECTS

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ABSTRACT

Efficacy of 0.01% fenvalerate, 0.07% endosulfan and 0.1% dichlorvos for the control of *Plutella xylostella* on cabbage was evaluated using three experimental designs *viz.*, randomized block, serial block and exploded block design. The results indicate probability of incorrect inferences that could be drawn for efficacy reports when randomized block design and serial block design are followed due to interplot movement of insects. Based on the results obtained, suitability of adopting modified exploded block design which has limited interplot movement has also been indicated for testing insecticides with varying efficacy.

Keywords : Experimental designs, Dispersal of insects, Insecticides

Entomologists are often confronted with problems relating to change in dispersal of insect pests in an experimental field (Taylor, 1987). These are usually triggered by an insecticidal application. Sometimes, unsprayed control plots may provide a source of infestation, which can affect population