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Seed set and seed yield of aggregatum onion (*Allium cepa* L. var. *aggregatum* Don.)

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Abstract : Seed production and its dependent characters were studied in five different ecotypes of aggregatum onion (*Allium cepa* L. var. *aggregatum* Don.). All the ecotypes recorded cent per cent sprouting. The mean days for sprouting ranged between 3.13 and 6.10 days. Among the ecotypes studied, E₅ recorded the highest number of umbels per plant (4.06), highest number of flowers per umbel (317.13), lowest number of leaves per plant (14.83) and least number of days taken for flowering (43.90). Regarding seed set and seed yield also E₅ yielded 7.02 g of seeds per plant, with a set percentage of 52.05 while E₁ recorded 92.16 per cent fruit set per umbel. The highest 1000 seed weight of 3.30 g was registered by E₅. Seeds of all ecotypes retained 40-50 per cent viability upto 6 months of storage. (**Key words :** *Aggregatum onion, Flowering, Seed setting, Seed yield, Seed viability*).

Onion seed production is a specialized job and it requires proper selection of mother bulb. Aggregatum onion is mainly propagated through previous season bulbs limiting the availability of such bulbs for further cultivation. Relative storage life of these bulbs is also less as compared to common onion. So, seed production in this crop gains importance. Though this crop is exclusively propagated by vegetative means, seed production is also encountered in certain parts of South Arcot district of Tamil Nadu. The aggregatum onion bulbs grown in this particular tract have more demand in foreign trade due to their low pungency and attractive colour. Therefore an initial attempt was made to study seed setting and seed viability in order to augment seed production in this crop.

Materials and Methods

Experimental material consisted of bulbs of five ecotypes collected from Gnanamedu (E₁), Utchimedu (E₂), Kandakadu (E₃), Devanamapattanam (E₄) and Subbavuppalavadi (E₅). They were raised in pots following the principles of completely randomized design, with 3 replications. The diameter of the bulbs ranged from 1.80-2.60 cm. The studies were carried out at Faculty of Agriculture, Annamalai University, Annamalainagar during 1995 and 1996.

Results and Discussion

Among the ecotypes studied, E₅ performed well in all aspects under Annamalainagar conditions. It is evident from the Table 1 that, E₅ sprouted earlier and it flowered in 43.90 days while E₃ took 48.10 days. All the ecotypes sprouted early and recorded cent per cent sprouting because they were stored for 3 months after harvest, since storage of bulbs for

ample time is required to overcome dormancy. The results obtained are in accordance with Corrales (1957) who stated that the bulbs of common onion stored for 100 days sprouted better. On an average the ecotypes flowered in 47.10 days which has taken comparatively lesser number of days than the stipulated period to flower. Number of leaves per plant at the time of flowering was very less in E₅ (14.83) but it produced 4.06 umbels per plant. The other ecotypes produced comparatively lesser number of umbels per plant. The number of flowers per umbel ranged from 142.00 to 317.13, the highest being in E₅ and the lowest was in E₂. Similar trend was also observed in case of number of flowers per plant. The total number of matured leaves per plant was low in E₅ because of its smaller bulb size of 1.80-2.00 cm diameter. Though E₁ produced more leaves per plant with a bulb size of 2.10 to 2.30 cm diameter, the scape production was low and ultimately resulted in less seed yield. This is contrary to the results of Ahlawat and Singh (1957), who reported that, with the increase in bulb size, the number of leaves and seed heads produced are more. In the present study E₅ with relatively smaller bulb size produced less number of leaves at the time of flowering and highest number of seed heads with greatest number of flowers per umbel. This is attributed to the innate genetic potential of the ecotype. Number of flowers per umbel produced by all the ecotypes are in agreement with the earlier findings of Gloperson *et al.* (1981) and Brewster (1994).

Seed yield per plant was highest (7.02 g) in E₅ and the lowest (2.90 g) in E₂. Though E₁ recorded 92.16 per cent fruit set, the yield was lesser (3.92 g per plant) than E₅ in which the fruit set was only

Table 1. Mean performance of ecotypes for vegetative and floral characters

Ecotype	Days taken for sprouting	Sprouting percentage	Days taken for flowering	Number of leaves/plant (at the time of flowering)	Number of umbels/plant	Number of flowers/umbel	Number of flowers/plant
E ₁	4.63	100	47.03	22.56	2.83	142.86	439.53
E ₂	4.26	100	46.46	21.16	2.70	142.00	385.80
E ₃	6.20	100	48.10	16.20	3.10	224.93	781.33
E ₄	5.30	100	45.13	18.27	3.17	224.00	728.53
E ₅	3.13	100	43.90	14.83	4.06	317.13	1113.13
Mean	4.706	100	46.12	18.60	3.17	210.18	689.66
F - test	*	NS	*	*	*	*	*
S.E.	0.3828	0	0.3065	2.1247	0.1264	14.6395	70.5873
C.D.	0.3114	-	0.2494	1.7285	0.1029	11.9099	57.4264
P(=0.05)							

* - Significant at 5% level NS - Non Significant

Table 2. Mean performance of ecotypes for seed yield

Ecotype	Number of seedheads/plant	Seed set/fruit (%)	Fruit set/fruit (%)	Seed yield/umbel		Seed yield/plant		Seed size (mm)		Weight of 1000 seeds (g)
				Number	Weight(g)	Number	Weight(g)	Length	Breadth	
E ₁	2.83	47.77	92.16	451.66	1.29	1315.09	3.92	2.98	2.21	3.21
E ₂	2.70	47.77	80.85	395.86	1.14	915.83	2.90	2.78	2.11	3.12
E ₃	3.10	44.99	53.05	354.66	1.18	1141.91	3.68	2.93	2.211	3.16
E ₄	3.17	49.99	59.73	366.33	1.23	1261.46	4.11	2.94	2.22	3.18
E ₅	4.06	50.55	52.05	520.60	1.63	2253.19	7.02	2.99	2.23	3.30
Mean	3.17	48.21	67.56	417.66	1.29	1377.49	4.33	2.92	2.19	3.19
F - test	*	NS	*	*	NS	*	*	-	-	*
S.E.	0.1264	2.1323	3.4481	64.8780	0.1928	155.46	0.5296	-	-	0.0860
C.D.	0.1029	1.7347	2.8052	52.7815	0.1569	126.47	0.4308	-	-	0.0699
P(=0.05)										

* - Significant at 5% level NS - Non Significant

Table 3. Seed germination at monthly intervals

Ecotype	Germination percentage at monthly intervals								
	Fresh	1	2	3	4	5	6	7	8
E ₁	99.31	98.87	98.72	98.82	84.38	84.08	84.12	80.32	64.42
E ₂	98.23	97.32	96.83	90.31	72.03	50.81	48.03	-	-
E ₃	99.20	98.41	97.49	92.82	80.33	62.38	48.32	48.73	44.31
E ₄	98.13	92.62	89.31	87.71	76.43	49.93	40.51	48.63	24.72
E ₅	99.41	98.43	98.21	96.85	86.81	70.21	68.71	48.81	40.83
Mean	98.85	97.85	96.11	92.46	79.99	63.62	57.93	45.29	34.85
F - test	*	*	*	*	*	*	*	*	*
S.E.	0.1020	0.1102	0.1099	0.2001	0.3101	1.2301	1.9876	1.9539	1.9868
C.D.	1.8522	1.8672	1.8691	1.8993	1.9321	2.0321	2.9431	2.5431	2.7391
P(=0.05)									

* - Significant at 5% level

52.05 per cent. E_5 recorded the highest seed yield of 7.02 g per plant. The results obtained for seed set per fruit (i.e. number of seeds per fruit) was not significant. Seed set per fruit was in the range of 47.77 to 50.55 per cent. On an average all the ecotypes produced 2 to 4 seeds per plant. The reasons for low fruit set in E_1 may be due to the production of more number of flowers per umbel, resulting in the competition among the flowers for nutrients. Besides it produced less number of leaves per plant ultimately resulting in reduced photosynthetic area. The low seed yield of E_1 may be due to the lesser number of seed heads per plant. The results obtained for seed size was greatest in E_5 (2.99 x 2.33 mm, length and breadth wise) and the smallest was recorded in E_2 (2.78 x 2.11 mm). Weight of 1000 seeds was the highest in E_4 (3.30 g) and the lowest was in E_2 (3.12 g). The greatest seed size and 1000 seed weight in E_4 may be attributed to the low fruit set percentage (Table 2).

Initial seed germinability was 98.60 per cent and it decreased with the storage of seeds. Under ambient conditions of storage, all the ecotypes retained 50 per cent germinability up to 6 months. During 7th month of storage, seeds of E_2 completely lost their viability while other ecotypes could retain it (Table 3). The reason for reduction of viability in E_2 may be leakage of solutes from the seeds. Seeds of other ecotypes showed 30-40 per cent viability up to 8 months of storage due to their boldness.

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Management of brown spot disease of rice by *Drechslera oryzae*

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Abstract : Date of sowing has profound effect on the development of brown spot disease and yield of rice. Crop sown on 15th May recorded maximum yield 5050 kg ha⁻¹ with minimum build up of disease severity 4.5 per cent. Contrary to this, late sown crop yielded the least (2896 kg ha⁻¹) with maximum disease severity of 21.1 per cent. Out of 157 varieties/entries screened against brown spot disease of rice, only 2 entries IET 13818 (OR 165-97-15) and IET 13830 (Rewa 14-174) showed highly resistant reaction and others were categorised as resistant, moderately resistant, moderately susceptible, susceptible and highly susceptible. (Key words : Brown spot, Rice, *Drechslera oryzae*).

Brown spot caused by *Drechslera oryzae* is a devastating disease of rice especially in calcareous belt of North Bihar and generally called a disease of poor management. Padmanabhan (1973) accounted it for the Great Bengal famine of 1942-43 during

which 52-90 per cent yield losses was recorded. Keeping in view the economic importance of the crop, widespread occurrence and heavy losses inflicted by the disease, the present investigations aim at the manipulation of agronomical practices and