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A High Yielding Ash-gourd Strain - CO

by

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Introduction: Ash-gourd or wax-gourd or white pumpkin (*Benincasa hispida* Cogn.) is being commercially grown in Tamil Nadu and other States of India for its fleshy fruits. In spite of the importance of the fruit for use as vegetables and in preparation of sweet-meats, there is no improved strain and only non-descript types are under cultivation in Tamil Nadu. These types give low and irregular yields for want of balanced production of staminate and pistillate flowers, resulting in wide sex ratio and low yields. According to Choudhury (1967) an ideal variety is one which has a narrow sex ratio of staminate to pistillate flowers. Towards this goal, breeding work was undertaken at Coimbatore for evolving a high yielding and better quality strain in ash-gourd combining desirable qualities.

Materials and Methods: Ten Types of ash-gourd were collected from different parts of the country and studied in an initial evaluation trial for their yield, quality and plant characters exercising selection in variable varieties. Six types adjudged to be high yielding with desirable plant characters were isolated from yield trials conducted at Coimbatore for three seasons. Yield of fruits (in terms of number and weight), number of days taken from sowing to opening of staminate and pistillate flowers and their respective node numbers and sex ratio of staminate to pistillate flowers and crop duration were recorded. The data were subjected to statistical analysis. Based on the results, three types were selected and tested for yield in comparison with local

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types in co-ordinated varietal trial in the various Agricultural Research Stations of the State and in district trials. The quality of fruits were adjudged by organo-leptic tests.

Results: The flowering pattern, yield and duration of the ash-gourd types tested in yield trials are furnished in Table 1. The performance of promising types of ash-gourd tested in the various Agricultural Research Stations and in cultivators' holdings are summarised in Tables 2(a) and 2(b) respectively. The results of the organo-leptic tests are given in Table-3.

TABLE 1. *Flowering pattern, yield and duration of Ash-gourd types (Mean of 3 seasons)*

Particulars	B.H. 1	B.H. 2-6 (CO. 1)	B.H. 3	B.H. 6	B.H. 8 (local)	B.H. 10	Signifi- cancy by 'F' test	S.E.	C.D. (P=0.05)
Yield (kg/ha)	11,153	19,067	11,436	18,911	8,535	12,611	Yes	790	2,260
As % on control	131	224	134	222	100	148			
As % on general mean	81.9	140.0	83.9	138.8	62.7	91.9			
Number of fruits/vine	5.6	7.6	5.8	6.8	4.4	6.1	Yes	0.31	0.92
Mean weight of fruit	5.7	6.80	5.4	6.2	5.2	5.9	Yes	0.41	1.11
Number of days from sowing to first staminate flower	62.7	60.2	63.6	61.4	65.2	63.1	No	0.29	0.86
to first pistillate flower	68.2	65.3	71.2	68.1	73.6	70.1	Yes	0.28	0.83
Node number of first staminate flower	16.4	13.2	15.9	14.6	18.6	15.2	Yes	0.62	1.62
pistillate flower	22.5	19.6	22.1	20.1	23.7	21.4	Yes	0.58	1.56
Sex ratio (S:P)	24:1	18:1	23:1	20:1	26:1	22:1	—	—	—
Total duration (days)	158	140	156	151	160	152	—	—	—

TABLE 2(a). *Yield of Ash-gourd types in kg/ha at Agricultural Research Stations (Mean of three seasons)*

Name of Agricultural Research Station	B.H. 2-6 (Co. 1)	B.H. 6	B.H. 10	Local
Aduthurai	21,316	20,326	16,420	14,229
Kovilpatti	22,420	21,595	15,216	13,532
Tindivanam	22,387	22,130	15,137	14,416
Palur	20,336	19,536	14,229	12,326
Bhavanisagar	19,326	18,427	12,316	11,210
Aliyarnagar	20,615	19,512	12,430	10,420
Tirurkuppam	20,326	19,412	10,686	9,310
Srivilliputtur	19,528	19,126	10,926	9,425
Mean of 8 centres	20,782	20,004	13,444	11,659
As % on control	176	168	113	100

Whether significant by 'F' test: Yes
S.E. = 869 C.D. (P=0.05) = 2,395

TABLE 2(b). Yield of Ash-gourd types in kg/ha in Scattered Block Trials (Mean of three seasons)

Districts (and number of trials)	B H 2-6 (CO. 1)	B H. 6	B.H. 10	Local
Coimbatore (8)	21,528	19,968	16,530	9,217
Tiruchirapalli (6)	19,616	18,536	15,426	9,098
Madurai (4)	19,528	19,101	15,126	9,046
Tirunelveli (4)	20,120	19,572	16,116	12,528
Ramanathapuram (3)	18,310	18,008	14,327	9,328
Kanyakumari (5)	18,216	17,549	13,536	9,016
Mean of 30 trials	19,553	18,789	15,177	9,706
As % on local	201	193	156	100

Whether significant by 'F' test = Yes

S.E.=908 C.D. (P=0.05)=2,684

TABLE 3. Results of Organo leptic Tests (Mean of 30 subjects)

Particulars	Total marks	B.H. 2-6 (CO. 1)	B.H. 6	B.H. 10	Local
Colour of fruit	5	2.6	2.5	2.1	2.1
Shape	10	7.4	7.3	6.3	5.3
Thickness of skin	5	4.7	4.6	3.9	3.2
Thickness of flesh	10	8.2	7.9	7.5	6.5
Seediness	5	2.4	2.5	2.0	2.3
Cooking quality	15	13.2	13.0	9.9	9.6
Total	50	38.5	37.8	31.7	29.0

Discussion: Out of the six types of ash-gourd tested under yield trial, BH.2-6 gave in all the three seasons significant higher yields ranging from 16,560 kg to 21,252 kg of fruits/ha with a mean yield of 19,067 kg/ha and mean percentage of increase over local control was 125. In the co-ordinated varietal trial also, conducted in the various Agricultural Research Stations, it significantly led others with a mean yield of 20,782 kg/ha i.e. 76% increase over the local. The same trend was noticed in district trials also where BH.2-6 recorded significant high yields, ranging from 18,310 kg to 21,582 kg/ha, with a mean yield of 19,553 kg/ha, the increase being 101% over local type. Selection BH. 2-6 yielded, on an average, 7.6 fruits per vine as against 4.4 in the local. Thus, when compared to the local control and the per vine yield of four to five fruits as reported by Rao and Rao (1953) and the average yield of 7,500 kg to 13,000 kg/ha as reported by Chauhan (1965), the yield of BH.2-6 ash-gourd is highly commendable.

The fruits of BH.2-6 ash-gourd are medium in size with mean length of 31.21 cm, mean breadth of 22.35 cm and a mean weight of 6.8 kg. The fruits are of good quality with better consumer's preference.

Selection BH.2-6 exhibited favourable flowering pattern which is a desirable character in cucurbits. First staminate and pistillate flowers appeared earlier in 60.2 and 65.3 mean days after sowing. Their mean nodal positions were also less with 13.2 and 19.6 respectively. The early appearance of flowers especially pistillate flowers at lower nodes in BH.2-6 is an added advantage to get an early crop with increased yields as suggested by Shifriss (1956 and 1961) and Choudhury (1967).

BH.2-6 produced a large number of pistillate flowers leading to a narrow sex ratio of 20:1 of staminate to pistillate flowers, whereas in other types the ratio was wide, ranging from 26:1 to 40:1. The narrow sex ratio in BH.2-6 is again a desirable factor to get high yields as suggested by Choudhury (1967). In BH.2-6, early appearance of staminate and pistillate flowers in lower nodes onwards has contributed to earliness of the crop yielding first harvest in 100 days after sowing and the crop duration was also less with 140 days compared to 151 to 160 days in other types. On account of the phenomenal high yield, good quality of fruits and early habit, surpassing all the available cultivated varieties, the selection BH.2-6 was hailed as a superior strain at the meeting of the State Seed Committee held during 1970 and was released as CO-1 ash-goured for general cultivation in Tamil Nadu. The plant description of the new strain is given in appendix.

Summary: Intensive breeding work conducted at Vegetable Section, Agricultural College and Research Institute, Coimbatore has led to the isolation of a new strain, CO-1 ash-gourd combining (1) higher yield of 19,467 kg of fruits per hectare, (2) more number of fruits per vine with a mean weight of 6.8 kg, (3) early production of staminate and pistillate flowers at lower node numbers, (4) a narrow sex ratio of staminate to pistillate flowers and (5) a shorter crop period of 140 days. The new strain is suitable for cultivation as monsoon as well as summer crops.

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