

the pest. But considering the mammalian toxicity and cost of the chemical, Malathion 0.1% spray only can be advantageously recommended for the effective control of this scale insect.

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CO 1 Pumpkin - A High Yielding Improved Strain

by

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Introduction : Pumpkin (*Cucurbita moschata* Poir.) is one of the important vegetable crops of Tamil Nadu. It is valued mostly as a vegetable and is also used as a main ingredient in the preparation of sweet-meats, thus providing opportunities for processing and canning industries. Yet, there has been so far no improved strain in pumpkin for cultivation in Tamil Nadu. Breeding projects were, therefore, undertaken at Agricultural College and Research Institute, Coimbatore for evolving an improved strain of pumpkin combining high yield, better fruit quality and desirable agronomic characters and the results are presented.

Materials and Methods: Thirty one types of pumpkin were collected from all over the country and studied in detail, in an initial evaluation trial, for their yield potential, quality and morphological characters. Selections were exercised in varieties which showed variations. Sixteen types, which appeared to be better among them, were selected and further tested for three seasons at Coimbatore under yield trials, eliminating in each season the poor performers based on yield of fruits, both in terms of number and weight (per plant as well as per hectare), days required for first staminate and pistillate flowering and node numbers on which they appeared, sex ratio of staminate to pistillate flowers and the total crop period. Five varieties were finally selected and tested for three seasons in eight Agricultural Research Stations and 32

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cultivators' holdings in Tamil Nadu. The yields were statistically analysed. Fruits were subjected to organo-leptic tests.

Results : The yield and plant characters of economic value of the 16 pumpkin types tested under yield trial at Coimbatore are furnished in Table 1. The results of the trials conducted at Agricultural Research Stations and in cultivators' holdings are furnished in Tables 2(a) and (2) (b), respectively and the organo-leptic tests in Table 3.

Discussion : Among the 16 types tested in yield trials at Coimbatore, selections CM 27-2-6 significantly and consistently ranked first in all the three seasons, yielding 24,182 kg to 36,346 kg of fruits/ha with a significant mean yield of 29,675 kg/ha which is 17% more than the local. In the co-ordinated varietal trial, CM 27-2-6 gave significantly higher yields with a mean yield of 26,065 kg/ha showing an increase of 16% over local. The same trend was observed in the district trials also with a mean yield of 25,880 kg/ha and the increase was 10% over local types under cultivation. Thus, the selection CM 27-2-6 in pumpkin has recorded consistently higher yields at all centres in all seasons of the trial than the present cultivated non-descript types. According to Rao and Rao (1953) pumpkin bears normally four or five fruits per vine. Compared against this and 4.2 mean number of fruits per vine in the local controls, the mean number of fruits per vine in CM 27-2-6 was 6.75. In comparison to the local types and to the general yield levels of 13,750 kg/ha as reported for pumpkin by Chauhan (1965) and 14,000 kg to 20,000 kg/ha by Anon. (1966), the yield of CM 27-2-6 is spectacular indeed.

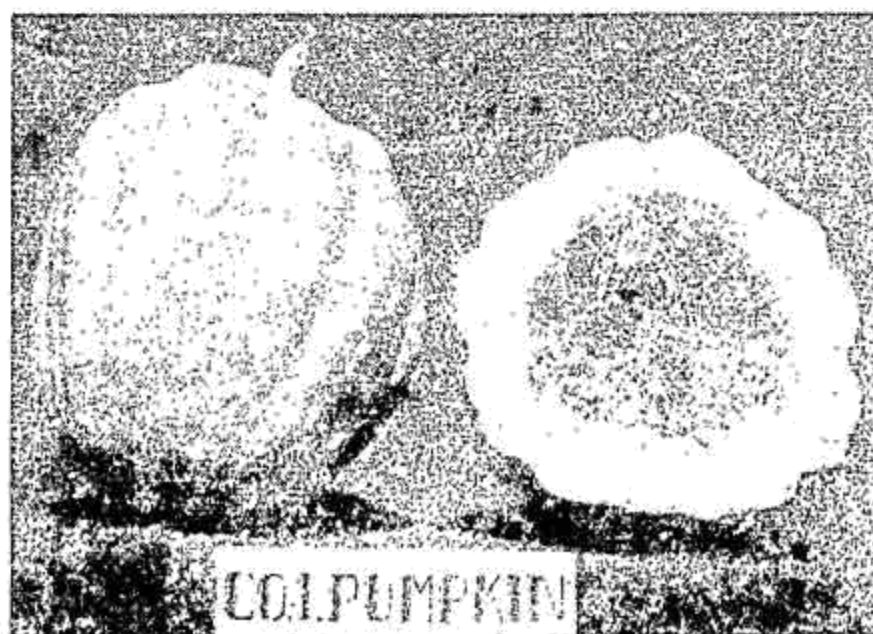


TABLE 1. Flowering pattern, Yield and Duration of Pumpkin varieties at Coimbatore (Mean of three seasons)

Particulars	CM. 1	CM. 10	CM. 12	CM. 14	CM. 16	CM. 20	CM. 21	CM. 22	CM. 24
Yield (kg/ha)	17,127	18,980	14,747	13,245	16,677	23,052	16,707	21,524	15,536
As % on local	69	75	59	53	66	92	66	86	62
Number of fruits/vine	4.3	6.3	4.0	3.8	4.0	5.5	5.0	5.3	3.8
Mean weight of fruit	4.1	3.0	3.6	4.4	2.9	6.0	2.5	6.3	3.8
Number of days from sowing to :									
first staminate flower	66.5	60.2	57.2	61.7	73.4	65.3	70.6	57.2	57.1
first pistillate flower	70.2	69.3	60.4	63.6	76.3	78.1	72.0	65.3	65.5
Node number of									
first staminate flower	13.1	12.2	12.6	12.4	15.1	13.0	13.4	12.5	12.3
first pistillate flower	30.2	28.1	21.6	29.2	31.4	24.3	29.2	24.3	22.2
Sex ratio (s : p)	22:1	16:1	19:1	22:1	21:1	16:1	19:1	16:1	22:1
Crop duration (days)	189	179	178	176	182	185	180	180	181

TABLE 1. Contd.

CM. 25	CM. 27-2-6 (CO.1)	CM. 28	CM. 29	CM. 30	CM. 31	Local	Sig. by F test	S.E.	(P=0.05) C.D.
15,555	29,675	22,915	21,754	15,139	22,220	25,116	Yes	1,108	3,625
62	117	91	86	61	88	100			
3.5	6.8	3.5	6.2	3.5	6.3	5.2	Yes	0.33	0.97
4.6	7.4	5.0	6.5	4.3	6.7	6.1	Yes	0.28	0.81
55.0	54.3	54.4	60.2	57.8	64.2	62.5	Yes	0.32	0.93
65.4	62.4	59.2	74.1	61.0	70.1	66.5			
12.1	11.6	12.4	18.5	12.4	13.3	16.2	Yes	1.02	3.02
21.0	20.1	22.5	25.1	18.5	22.0	24.5	Yes	0.69	1.76
26:1	13:1	20:1	15:1	20:1	16:1	20:1			
180	175	177	186	175	182	180			

TABLE 2. (a) *Yield of Pumpkin types in kg/ha at Agricultural Research Stations (Mean of two seasons)*

Name of the Agrl. Research Station	Local	CM. 20	CM. 27-2-6 (CO. 1)	CM. 28	CM. 29	CM. 31
Aduthurai	17,247	18,000	22,050	17,450	17,631	17,420
Kovilpatti	29,070	26,082	33,678	21,231	27,863	20,843
Tindivanam	20,130	21,422	24,670	22,163	20,213	21,454
Palur	16,814	15,694	19,110	16,604	15,580	15,962
Bhavanisagar	28,440	27,410	31,216	28,120	22,311	22,670
Aliyarnagar	23,450	21,910	25,924	19,561	18,436	18,626
Thirurkuppam	18,620	17,431	22,320	17,642	17,202	16,471
Srivilliputhur	25,150	24,440	29,420	26,340	26,202	24,122
Mean of 8 centres	22,388	21,549	26,065	21,139	20,679	19,651

Whether significant by 'F' test: Yes, S.E. 425 C.D. (P=0.05) = 1,218

TABLE 2. (b) *Yield of Pumpkin types in Scattered Block Trials (Mean of three seasons)*

District and no. of trials	Local	CM. 20	CM. 27-2-6 (CO. 1)	CM. 28	CM. 29	CM. 31
Coimbatore (8)	23,838	22,576	24,238	22,050	21,320	18,236
Tiruchirapalli (6)	22,840	22,626	23,320	20,152	19,432	19,564
Madurai (6)	23,262	24,320	26,420	22,120	20,150	23,410
Tirunelveli (4)	23,438	22,638	26,635	22,635	21,419	32,120
Ramanathapuram (3)	24,410	23,126	29,320	23,420	20,612	23,120
Kanyakumari (5)	24,212	20,125	25,346	18,632	20,326	22,758
Mean of 32 trials	23,667	22,602	25,880	23,185	20,543	22,368
% on local	100	96	110	98	87	97

Whether significant by 'F' test: Yes, S.E. 626 C.D. (P=0.05) = 1,831

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

Particulars	Total marks	Marks obtained					
		Local	CM. 20	CM. 27-2-6 (CO. 1)	CM. 28	CM. 29	CM. 31
Colour of fruit	5	2.1	2.1	3.5	3.4	2.0	2.4
Shape	10	5.2	6.5	6.4	6.3	5.2	6.5
Thickness of skin	10	7.6	6.7	7.2	8.6	7.3	7.6
Thickness of flesh	10	5.2	4.0	8.0	6.3	5.4	6.0
Seediness	5	2.3	3.1	4.1	3.1	2.1	3.1
Cooking quality	10	5.0	6.2	7.2	4.2	5.2	6.2
Total	50	27.4	28.6	36.4	31.9	27.2	31.8

The fruits of CM 27-2-6 are moderately big, the mean length and girth being 34.2 cm and 26.5 cm, respectively. Each fruit weighs, on an average, 7.4 kg compared to 6.2 kg of the local. The seed content of the fruit is also less (1.2%) with thick flesh of attractive reddish yellow colour. The grooves on the fruit are less prominent with the result the flesh is of uniform thickness all around the fruit. The fruit has better consumers' appeal as evidenced by organo-leptic scoring.

The new selection is earlier than others, the first staminate and pistillate flowers appearing, respectively in 54.3 and 62.4 mean days after sowing (Table 1). Their respective nodal positions are also low with 11.6 and 20.1. The earlier production of flowers, especially pistillate flowers, at lower nodes is an asset to get an early crop with high yield as recorded in pumpkin by Choudhury (1967) and in cucumbers by Shifriss (1956 and 1961).

The selection CM. 27-2-6 produces more number of pistillate flowers leading to a narrow sex ratio of 13:1 (of staminate to pistillate flowers), whereas in other types the sex ratio ranges from 16:1 to 20:1. The narrow sex ratio observed in the new selection is a desirable character to get increased yield, since excessive production of staminate flowers and lesser number of pistillate flowers decreases the yield with resultant loss to the grower. According to Scot (1933), Shifriss and Gauln (1956), Singh (1958) and Choudhury (1967) an ideal variety is that which has a narrow sex ratio of staminate to pistillate flowers. The selection CM. 27-2-6 should, therefore, be considered as an ideal variety, for it combines balanced production of staminate and pistillate flowers initiating from lower nodes onwards and narrow sex ratio, in addition to high yield and better quality of fruits. Compared to other types, the crop duration is also less with 175 days, the first harvest of fruits coming in 115 days after sowing. Hence, the selection CM. 27-2-6 was approved as an improved strain by the State Seed Committee at its meeting held in February 1970, and was released as CO. 1 pumpkin for cultivation in Tamil Nadu. The morphological description of CO. 1 Pumpkin is given as an appendix.

Summary: A new strain CO. 1 pumpkin was isolated and released for cultivation. It yields 29,675 kg of fruits/ha in 175 days. The fruits are moderately big with thick flesh of reddish yellow colour and better consumers' preference. The new strain combines, in addition, balanced production of staminate and pistillate flowers commencing from lower nodes and narrow sex ratio which factors contribute to earliness and ultimate yield.

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APPENDIX

PLANT CHARACTERS OF CO 1 PUMPKIN

- Habit : Annual, long trailing vines upto 1,200 cm
- Stem : Rough, pubescent, often rooting at nodes with 8 to 10 branches
- Flowers : *Staminate* :- with longer pedicels ; calyx green and foliaceous ; petals bright yellow, 5 and united ; stamens 5 and connate
- Pistillate* :- with shorter pedicels ; calyx green and foliaceous ; petals bright yellow, 5 and united ; stigma normal
- Fruit : Peduncle angled, expanding at the point of attachment of fruit ; fruit globular, flattened at the base, length 34.23 cm, girth 26.23 cm, flesh 4 - 5 cm thick, less seeded (1.2%), 6.75 fruits/vine, each fruit weight 7.4 kg
- Duration : No. of days from sowing to
- (i) first harvest : 115
- (ii) completion of harvest : 175
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