

A Note on 'Single-vine' Selection in Cucumber. (*Cucumis sativus*)

By

M. B. V. NARASINGA RAO and K. RAJAGOPALAN,
(Agricultural Research Station, Pattambi)

On analogy with the large scale improvements that were possible by selection, from natural and hybrid populations in self-fertilised crop plants, it would appear that such a method may also be fruitful in cross-fertilised crops. The results obtained in some of the cross-fertilised crops, like maize and lucerne have showed the value of selection methods in improving them. A standard method for these cross-fertilised crops does not however appear to be feasible as it is found that the effects of continuous self and cross fertilisations are sometimes good and sometimes bad. Hence the methods of improvement in cross-fertilised crops will depend upon the crop in question. On the West Coast gourds are one of the vegetables extensively grown as summer crops and sometimes as monsoon crops. At the Agricultural Research Station, Pattambi, studies are in progress on these vegetables and the present note deals with the studies of 'Vine—to—Vine' selection made on cucumber at the Station.

The cucumber is strictly monoecious and a certain amount of cross fertilisation should therefore be expected. Gabaev (1932) is of the opinion that all the three lines of work, viz., mass selection, single-plant selection and hybridisation could be used for the improvement of this crop. Preliminary observations at Pattambi indicate that there is no loss of vigour by continuous selfing for two generations. While Whitaker and Jagger (1937) concluded that hybrid vigour did not occur in any of the cucurbits, Hutchinson (1938) in cucumber and Curtis (1939) in squash have observed marked hybrid vigour. Studies on heterosis are also being continued at the Agricultural Research Station, Pattambi.

From samples of cucumber seeds collected in the locality 250 pits consisting of about 1000 vines were sown in February 1945 at the Agricultural Research Station, Pattambi. From the shape of fruits it is seen that two distinct types of cucumber are present in this collection. One variety is long and another more or less round giving an appearance of a triangular prism with three edges. The fruits have the following average dimensions.

	Average length.	Average width.	L/B
Long	32.1 \pm 0.53 cm.	11.4 \pm 0.11 cm.	2.8
Round	17.0 \pm 0.51 cm.	16.5 \pm 0.67 cm.	1.1

These shapes are found to breed true and the hybrids between them usually have an intermediate shape. A 'vine to vine' study was made for

the total number and weight of fruits per vine. Seed from those vines which gave high weight of fruit per vine and which were pure for the shape of fruit, was gathered and in February, 1946 seed of the individual cultures was sown separately, each culture having about 30 vines. As some natural crossing is inevitable between round and long shapes growing together one or two fruits with hybrid shapes were found occasionally. All the vines in that row which showed variations in fruit shapes were rejected for seed purposes and fruits were selected for seed purposes only from vines in rows which were uniform in fruit shape. A similar study for the total number and weight of fruits of each culture was made that season also and on the basis of these studies 16 cultures were carried forward. In February, 1947 these cultures were repeated thrice with 25 vines for each replication. They were harvested separately and the weights recorded.

The correlation of parent and progeny with regard to total weight of fruit per vine was calculated for the two years and the results are given below:—

Year	No. of pairs	Mean Wt. of progeny Oz	Mean Wt. of progeny Oz	Total correlation 'r' between parent and progeny	Significant 'r' P = 0.05
1946	22	92	161.5	0.77	0.423
1946	16	151.0	259.0	0.53	0.497

It is seen that the correlation in each year is positive and significant. It may therefore be concluded that pure line selection in cucumber is effective in evolving high yielding strains. The results of the yield trials also showed that the selection improves the yield as it was found that six cultures are well above the general mean in yield.

References.

1939. Curtis, L. C. } Quoted by Hayes and Immer 'Methods of plant breeding'. McGraw—Hill Book Co, N. Y.
1932. Gabaev, S. G. } Cucumbers. (In Russian). Imperial Bureau of plant Genetics 635.63. (Translation Summary.)
1938. Hutchinson, A. E } Quoted by Hayes and Immer 'Methods of plant breeding'.
1937. Whitaker and Jagger }

Summary.

A vine to vine selection was made in cucumber (*Cucumis sativus*) at the Agricultural Research Station Pattambi and the yield trials with these cultures disclosed the superiority of some of them for yield of fruit.