SEEDLESSNESS IN PAPAYAS.*

OBSERVATIONS made by the writers and by Mr. P. G. Joshi, Superintendent of the Ganeshkhind Botanical Gardens, Kirkee, show that perfectly formed papaya fruits containing no seeds are of not uncommon occurrence. During the months August 1923 to February 1924, these appeared in the Ganeshkhind Botanic Gardens orchard on eleven female trees in the following numbers :—

Month.	Number of fruits harvested.	Number seedless.
1923—		
August	14	0
September	40	0
October	26	4
November	21	8
December	9	7
1924—		
January	18	9
February	14	11

The question arose: "Is this lack of seeds due to lack of pollination, or has there been pollination but no fertilisation ?" To settle this point, flowers on pure female trees were bagged with paper envelopes or cloth bags. In every case of a bagged flower, a fruit was formed, containing no seeds and smaller in size than a fruit developing seeds in the usual way.

In the Montgomery District in the Punjab, there are no plants of papaya for a radius of 200 miles from the Government farm, and on this farm female papayas (there were no male ones retained) all developed fruits, and these were seedless.

It appears then that the fruit as apart from the seed of the papaya tree can develop without pollination. Davies confirms this, but Popenoe and Higgins state the contrary. It is just possible that as both these observers refer to conditions outside India, while Davies and ourselves refer to Indian conditions, that this may be the explanation of the disagreement.

We have also proved that partial pollination (*i.e.*, pollinating only certain branches of the stigma) results in partial fruit setting, the carpels corresponding to the pollinated stigma branches alone setting seed. The weight of fruit is, as one would expect, more or less proportionate to the number of seeds developed.

None of our observations bear out the contention of Higgins and Holt that a parthenocarpic tendency is inherited. Moreover, on one and the same tree are found fruits (*a*) fully seeded, (*b*) with seeds at the stigmate end, (*c*) without seeds.

We conclude therefore that for the trees which we have observed in India seedlessness is due to lack of pollination and to nothing else, and that the weight and size of the fruits is proportional to the number of seeds set. If it is desired to produce seedless papayas, all that it is necessary is to exclude pollen.

* By G. S. Cheema and P. G. Dani in *The Agricultural Journal of India*, Vol. XXIV, Part III, May 1929.