FRUIT-SET STUDIES IN SWEET LIME*

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Received July 24, 1964
(Communicated by Dr. L. D. Kapoor, F.A.Sc.)

INTRODUCTION

SWEET LIME (Citrus limettioides Tanaka) fruits are the earliest to come into the market amongst the sweet group of citrus fruits. Although the fruits are insipid, still they are in great demand during the period, viz., July–August, due to their refreshing juice. Besides, the Sweet lime has got anti-malarial and other therapeutic properties which enhance its economic importance (Anonymous, 1949; Chopra et al., 1956). However, Sweet lime has been reported to bear scantly crops, thus offering a great handicap for its extensive cultivation (Singh et al., 1957).

Thus with a view to improve fruit-set in this fruit crop, the present studies were undertaken at the Horticultural Research Institute, Saharanpur.

MATERIALS AND METHODS

The plants selected for these studies were 8 years of age, healthy and uniform in growth, and under similar cultural treatments. The following three sets of experiments were conducted:

A. Controlled pollination.
B. Cultural operations.
C. Spraying with various plant regulators.

RESULTS

(A) Controlled pollination.—Flower-buds were emasculated before the dehiscence of their anthers and different modes of pollination tried. During 1961, only five treatments, viz., stigma decapitated and no pollination, natural open pollination, hand-selfing, and spraying with 50 and 100 ppm GA, were undertaken, whereas in 1962 in addition to these five, six more modes of

* The studies are a part of the work approved for the award of Ph.D. degree, conducted as a Senior Research Fellow of Indian Council of Agricultural Research.
pollination with pollen of Karna Khatta (*C. karna*), Duncan grapefruit (*C. paradisi*), Hamlin sweet orange (*C. sinensis*), East India mandarin (*C. reticulata*) and Rangpur lime (*C. limonia*), were followed. The results are presented in Table I.

**Table I**

*Percentage of fruit-set in Sweet lime under different pollination treatments*

<table>
<thead>
<tr>
<th>Mode of pollination</th>
<th>No. of stigmas pollinated</th>
<th>1961</th>
<th>1962</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of fruits set after one month</td>
<td>% of fruit-set</td>
</tr>
<tr>
<td>Stigmas decapitated and not pollinated</td>
<td>5</td>
<td>4</td>
<td>80</td>
</tr>
<tr>
<td>Natural open pollination</td>
<td>5</td>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>Hand-selfed + 50 ppm GA</td>
<td>5</td>
<td>4</td>
<td>80</td>
</tr>
<tr>
<td>Hand-selfed + 100 ppm GA</td>
<td>5</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Stigmas decapitated and sprayed with 50 ppm GA</td>
<td>5</td>
<td>4</td>
<td>80</td>
</tr>
</tbody>
</table>

Crossed with pollen of:

1. Karna Khatta                              | 5                          | 4    | 80   |
2. Duncan grapefruit                          | 5                          | 3    | 60   |
3. Hamlin Sweet orange                       | 5                          | 2    | 40   |
4. East India mandarin                       | 5                          | 2    | 40   |
5. Rangpur lime                              | 5                          | 4    | 80   |

*N.B.—Only the first five treatments were given in 1961 as well as in 1962, whereas rest were only given in 1962.*