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EFFECT OF MECHANICAL INJURY ON THE
PRECLIMACTERIC LIFE OF BANANA FRUITS

By B. C. PEACOCK, B.Sc.

SUMMARY

Mild injuries occasioned by dropping, scratching or cutting shortened the green-life of fruits, but such injuries would be of commercial significance only with bananas that just failed to reach a market.

I. INTRODUCTION

The Queensland banana trade periodically suffers loss from fruit arriving on southern Australian markets in a "mixed ripe" condition, i.e. with cartons containing both ripe and green fruit. Mechanical injury has recently been proposed as a factor contributing to decreased green-life in this fruit (Maxie *et al.* 1968). (Green-life of climacteric-type fruit is defined (Peacock and Blake 1970) as the time that elapses from harvest until the onset of the respiratory climacteric rise under any defined conditions). Maxie *et al.* demonstrated that mechanical injury results in an increase in the ethylene production rate of bananas and a subsequent shortening of green-life. However, the injuries they imposed were severe, being (a) $\frac{1}{2}$ in. of stem end crushed, (b) $\frac{1}{2}$ in. of flower end crushed, and (c) $\frac{1}{10}$ of the surface of one face of the stem or flower end scraped to a depth of $\frac{1}{16}$ in. with steel wire gauze. Of these treatments, (a) and (b) would make the fruit commercially unacceptable.

A small investigation has been conducted to verify the results of Maxie *et al.* and to determine whether milder injuries, such as are more likely to occur in normal shipments, could produce a result of possible commercial significance.

II. MATERIALS AND METHODS

Forty fruit from two adjacent hands off each of five bunches of bananas (cv. Giant Cavendish) were randomly divided over the following four treatments:

- A. Control.
- B. Each fruit bruised by dropping once from a height of 5 ft onto a wooden floor.
- C. Each fruit scratched to a depth of approximately 0.5 mm with a nylon pot scourer over approximately $\frac{1}{10}$ of its surface.
- D. Each fruit cut three times, each cut being 1 in. long and skin deep.

After being injured, all fruit were dipped in 400 p.p.m. of thiabendazole to prevent fungal infection and held at 20°C on trays in a special cabinet, in which they were ventilated with high-humidity, ethylene-free air at a rate in excess of 100 ml/min/fruit. The green-life of each fruit was estimated by determining the time that elapsed until the first visually detectable change in skin colour occurred. The time that elapses between the onset of the climacteric rise and this stage of skin colour is independent of the actual green-life of the fruit (Peacock 1966), and hence time to the latter can be used as an estimate of green-life.

III. RESULTS AND DISCUSSION

The results obtained are shown in Table 1. The three types of injury significantly shortened green-life, thus confirming the effect found by Maxie *et al.* (1968).

TABLE 1
EFFECT OF TREATMENT ON GREEN-LIFE

Treatment	A	B	C	D
Bunch 1. Mean greenlife (days)	17.5	16.4	15.4	16.4
S.D.	2.759	1.506	0.726	2.503
Bunch 2. Mean greenlife (days)	12.6	11.9	12.5	12.5
S.D.	1.713	3.408	1.354	2.224
Bunch 3. Mean greenlife (days)	9.6	7.5	6.0	6.6
S.D.	1.740	3.440	3.333	3.026
Bunch 4. Mean greenlife (days)	15.8	15.6	14.2	14.7
S.D.	1.398	2.591	1.317	1.225
Bunch 5. Mean greenlife (days)	12.2	11.7	10.8	12.0
S.D.	0.789	1.337	2.150	0.471
B, D < A	(<i>P</i> < 0.05)			
C < A	(<i>P</i> < 0.01)			

It would appear from the amount of shortening obtained, 11.5% in the worst case, that only with bananas that just fail to reach a market would the effect of mild injuries be of commercial significance.

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The author is an officer of Horticulture Branch, Queensland Department of Primary Industries, stationed at the Sandy Trout Food Preservation Laboratory, Brisbane.