

# Performance of four varieties of guava, (*Psidium guajava*, L.) in the intermediate zone of Ceylon

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## SUMMARY

Varieties Safaeda, Seedless, Wickramasekara and Allahabad were grown at Kundasale to study their performance under the soil and climatic conditions of the intermediate zone of Ceylon. This region receives an annual rainfall of approximately 55 inches.

Variety Safaeda was the highest yielding, both in total weight and in the number of fruits. The average fruit weight of this variety was also the highest.

The productive life span of guava under these experimental conditions was 8 years. Seedlings of the variety Allahabad died earlier than the other varieties.

## INTRODUCTION

A large number of varieties of guava has been cultivated in this country for a long period. These are either hybrids that have evolved naturally or varieties introduced from abroad. However, the yield potential of these varieties and their performance under local conditions have not been investigated. The commercial exploitation of this crop for the fresh fruit market and for the processing industry has been as a result of its value as a rich source of vitamin C.

Guava, is seen to grow satisfactorily in the wind swept and semi-dry areas below the Beragala—Belihuloya road, Walapane area and the Monaragala district. In the utilization of these poor soils for cropping, guava could be used profitably. Recent developments in Ceylon and abroad show that markets for guava jelly, jam and juice are very extensive.

This trial was conducted in the Horticultural Research Section of the Government Farm, Kundasale. Kundasale is situated in the Intermediate zone of Ceylon and receives an annual rainfall of approximately 55 inches.

The soil in the land used for this trial was an immature brown loamy soil (Panabokke—1967), with a depth of not more than  $2\frac{1}{2}$  ft. Below this layer of soil is the immature, partly weathered crumbly parent material. This soil is typical of the poor soil on which guava grows in the wild state.

#### MATERIALS AND METHODS

Four varieties of guava were tested in this trial. These varieties were Safaeda, Seedless, Wickramasekera and Allahabad.

This trial was laid down in October, 1956, using the randomized block design with 6 replicates. Each block had 4 single tree plots which were planted with a single variety. Plants were spaced 20 feet  $\times$  20 ft. making the block size 80 feet  $\times$  20 feet. Planting holes were prepared by cutting pits 18 inches  $\times$  18 inches  $\times$  18 inches, and they were filled with a mixture of top soil and compost well in advance of planting. The plants were carefully tended and manured with 1:2:1: NPK fertilizer mixture, in January 1957, at the rate of 3 lbs. per plant. The same quantity of fertilizers per plant having the same proportions of NPK was given in April, 1958. The entire experimental area was planted with *Stylosanthes gracilis*, H.B & K. to keep the weeds under control and to improve the organic matter and nitrogen status of the soil. After the *Stylosanthes* cover was established clean weeding was confined to the areas immediately around the bases of the plants and the remaining areas were selective weeded.

As the guava trees showed signs of yellowing during the Yala season of 1960, a supplementary application of cattle manure, at the rate of 30 lbs. per tree, was given in July that year. This application was followed by the regular annual application of the NPK mixture at the rate of 3 lbs. per tree.

Harvest data were collected continuously from Yala 1958, up to the end of Maha 1964-65. As 50% of the plants died due to severe dry weather in 1965 the experiment was abandoned at this stage. The yield data collected from this trial were the net yields of harvest after heavy bird damage and other losses were discounted.

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### RESULTS

In May, 1957, some of the plants were observed to be in flower. Up to the end of December, 1957, only 4 trees yielded fruits but these yields were not used in the analysis.

The yield data and average weight of fruits per variety are given in tables I and III. Table III also shows the total number of plants that died during the period the experiment was conducted.

Yield data from replicate III, were not used and this block was left out in the analysis (Table II), as it gave unusually low yields. The losses caused by animals were assumed to be normal and distributed at random and the data were analysed ignoring this loss in yield.

### DISCUSSION

The data indicate that the variety Safaeda was superior to the other three varieties at the 1% level of significance (Tables I & II). The variety Allahabad was superior to the variety "Seedless" and the variety Wickramasekara was the lowest yielder. The poor performance of Allahabad could be attributed to the death of 4 plants and probable genetic variability of seedlings used in the experiment.

The death of Allahabad trees (highest out of the 4 varieties) was unexpected. This is probably due to the sensitivity of this variety to shallow soils, of the type found in Kundasale.

The variety Wickramasekara had the highest number of surviving plants at the conclusion of the experiment. Yet it yielded the smallest number of fruits and consequently the lowest yield per plot. Seedless variety which yielded a lower fruit number than Wickramasekara produced fruits with the lowest fruit weight (Table II.) However, under the soil and climatic conditions that prevailed at the Horticultural Section of the Kundasale Farm the variety Wickramasekara fared very poorly.

Another very important fact that emerged from this trial is that the guava plant is shortlived under the soil and climatic conditions in which this experiment was conducted. The productive life span of guava under these conditions appears to be not more than 8 years. Under the system of management practised in this trial at Kundasale, steps have to be taken to replant guava every 10 years.

The income from guava was very unattractive when a pound of fruits fetched only 10 cents in 1957. The current price of 20 cents per pound (1970), gives a better margin of profit. With higher levels of

management and better control of losses due to pests and other causes the varieties Safaeda and Allahabad could give much higher profits than at present.

It is concluded that the variety Safaeda grown in the shallow soils at Kundasale (in the intermediate zone of Ceylon) gave the highest yields in weight and number of fruits per acre (Table III). The varieties Seedless and Wickramasekara were poor in their performance and did not give economic returns under the conditions in which experiment was conducted.

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#### REFERENCES

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PERFORMANCE OF FOUR VARIETIES OF GUAVA

TABLE I.—Total Yield of Fruits (in pounds) from Yala 1958 to Maha 1965

| Variety        | Repli-<br>cate<br>I | Repli-<br>cate<br>II | Repli-<br>cate<br>IV | Repli-<br>cate<br>V | Repli-<br>cate<br>VI | Total      | Average<br>of five<br>Replicates |
|----------------|---------------------|----------------------|----------------------|---------------------|----------------------|------------|----------------------------------|
| Safaedad       | .. 496.06..         | 639.27..             | 723.52..             | 542.13..            | 574.14..             | 2975.11..  | 595.02                           |
| Allahaba       | .. 362.01..         | 90.33..              | 326.38..             | 327.69..            | 549.57..             | 1,655.98.. | 3315.20                          |
| Seedless       | .. 138.68..         | 89.51..              | 130.53..             | 105.42..            | 158.92..             | 623.06..   | 1243.61                          |
| Wickramasekara | .. 102.36..         | 67.22..              | 60.65..              | 108.11..            | 91.49..              | 429.83..   | 85.97                            |

L.S.D.=5% 132.88 lbs.

1% 187.84 lbs.

TABLE II.—Total number of Fruits Harvested per plot from Yala 1958 to Maha 1965

| Variety        | Repli-<br>cate<br>I | Repli-<br>cate<br>II | Repli-<br>cate<br>IV | Repli-<br>cate<br>V | Repli-<br>cate<br>VI | Total     | Mean   |
|----------------|---------------------|----------------------|----------------------|---------------------|----------------------|-----------|--------|
| Safaeda        | .. 2117 ..          | 2640 ..              | 2995 ..              | 2228 ..             | 2276 ..              | 12,256 .. | 2451.2 |
| Allahabad      | .. 1803 ..          | 423 ..               | 1746 ..              | 1500 ..             | 2316 ..              | 7,788 ..  | 1558.6 |
| Seedless       | .. 1094 ..          | 639 ..               | 942 ..               | 797 ..              | 1193 ..              | 4,665 ..  | 933.0  |
| Wickramasekara | .. 612 ..           | 480 ..               | 423 ..               | 764 ..              | 610 ..               | 2,889 ..  | 577.8  |

L.S.D. = 5% 581.2

1% 815.8

TABLE III.—Yield of Fruit Weight and Numbers of Fruits for 8 years, and Number of Plants that Died

| Variety        | Total Wt.<br>of fruits<br>from 5<br>plots (lb.) | Total No.<br>of fruits<br>from 5<br>plots | Av. Wt.<br>of fruits<br>(ozs.) | Yield<br>per acre<br>lb. for<br>8 yrs. | Average<br>yield<br>per<br>year (lb.) | Total No.<br>of plants<br>that<br>died |
|----------------|-------------------------------------------------|-------------------------------------------|--------------------------------|----------------------------------------|---------------------------------------|----------------------------------------|
| Safaeda        | .. 2975.11..                                    | 12,256..                                  | 3.88 ..                        | 64,798..                               | 8,100..                               | 3                                      |
| Allahabad      | .. 1655.98..                                    | 7,788..                                   | 3.40 ..                        | 36,068..                               | 4,508..                               | 4                                      |
| Seedless       | .. 623.06..                                     | 4,665..                                   | 2.14 ..                        | 13,571..                               | 1,697..                               | 3                                      |
| Wickramasekara | .. 429.23..                                     | 2,889..                                   | 2.38 ..                        | 9,362..                                | 1,170..                               | 2                                      |