

A SIMPLIFIED METHOD OF INDEXING ROOT (WILT) AFFECTED COCONUT PALMS*

P. T. N. NAMBIAR and N. G. PILLAI**

Central Plantation Crops Research Institute, Kasaragod 670 124, Kerala, India

ABSTRACT

The earlier method of indexing the severity of root (wilt) disease of coconut was based on flaccidity, yellowing and necrosis, the three major visual symptoms on all the leaves on the crown. An attempt has been made to simplify the method of the indexing by taking into account only the leaves present in any of the five spirals. It is possible to work out the disease index from the symptoms present in the leaves of the third spiral in about 10 minutes as against over 30 minutes required for indexing by the earlier method.

INTRODUCTION

Earlier studies on a large number of root (wilt) affected coconut palms (Radha and Lal, 1972) indicated the relative contribution of the three visual symptoms *viz.*, flaccidity, yellowing and necrosis to the intensity of the incidence of the disease. Based on these three major visual symptoms of root (wilt) disease on all the leaves on the crown of coconut palm, an indexing method was developed to assess the disease severity (George and Radha, 1973). Although this method helps to critically evaluate the disease intensity, it is time consuming and cumbersome. Necessity for developing a quicker method of indexing was felt and hence the present study was undertaken.

MATERIALS AND METHODS

Four hundred and ten disease affected adult coconut palms of the age group, 12 to 40 years in 8 locations

in different soil types were selected as the experimental materials for the present study. All the leaves of these palms were scored for the three visual symptoms of the root (wilt) disease *viz.*, flaccidity, yellowing and necrosis. The leaves on the crown of coconut palm are arranged in five spirals (Menon and Pandalai, 1958). The spirals may be left or right inclined, which will remain the same throughout the life of the palm and the number of leaves in a spiral depends on the total number of leaves. In each spiral, the leaves are arranged one above the other inclined by 15 to 35° from one another. The first spiral consists of leaves above the oldest functioning leaf. The second spiral consists of leaves above the second oldest functioning leaf and so on. The first spiral consists of oldest leaves compared to the corresponding leaves of any other spiral. So also the fifth spiral consists of younger leaves

* Contribution No. 423, Central Plantation Crops Research Institute, Kasaragod

** Central Plantation Crops Research Institute, Regional Station, Kayangulam, Kerala, India

compared to the corresponding leaves of other spirals. In each location all the selected palms were indexed based on the scores given to all the leaves on the crown (George and Radha, 1973) and then by considering only the leaves contained in the first, second, third, fourth and fifth spiral counted from the bottom of the crown. The index of palms worked out by the above six ways in each location were analysed separately. The analysis of variance technique was employed taking the six ways of indexing as treatments and the number of palms studied as replications. The relative net precision (RNP) was calculated using the formula $RNP = \frac{1 \times 100}{CV \times t}$ where, 't' is the time taken for indexing, and CV, the coefficient of variation in index values for each spiral.

RESULTS AND DISCUSSION

The results are presented in Table I and II. The older leaves manifest more symptoms of the disease as compared to the younger leaves. This is reflected from the slightly higher indices obtained from the older spirals and lower indices obtained from the younger spirals. However, it was observed that in a majority of cases the indices obtained from different spirals do not differ significantly from the index obtained from all the leaves. The RNP values for individual spirals are 4 times more than that for all the leaves taken into consideration. Also the differences in the RNP values among the individual spirals are negligible. This indicates that any spiral may be conveniently chosen for indexing the palms for the root (wilt) disease intensity without

loss of information and also with less time and efforts on the part of the investigators.

Table I. *Grade points given to all the leaves of a root (wilt) affected coconut palm*

Leaf number from below	Grade points		
	Flaccidity	Yellowing	Necrosis
1	3	1	1
2	3	2	1
3	3	1	1
4	3	1	1
5	3	1	1
6	3	1	1
7	3	0	1
8	3	1	1
9	3	1	0
10	3	1	1
11	3	0	0
12	2	1	0
13	3	0	0
14	2	0	0
15	2	0	0
16	2	0	0
17	2	0	0
18	2	0	0
19	1	0	0
20	2	0	0
21	1	0	0
22	1	0	0
23	1	0	0
Total	54	11	9

Table II. *Grade points on the leaves contained in the 3rd spiral*

Leaf number	Grade points		
	Flaccidity	Yellowing	Necrosis
3	3	1	1
8	3	1	1
13	3	0	0
18	2	0	0
23	1	0	0
Total	12	2	2

There were 23 leaves on the crown and the 3rd spiral had 5 leaves.

$$\text{Index based on all the leaves} \\ = \frac{(54+11+9)}{23} \times 10 = 32.1$$

$$\text{Index based on the 3rd spiral} \\ = \frac{(12+2+2)}{5} \times 10 = 32.0$$

ACKNOWLEDGEMENT

The authors are grateful to Dr. Robert Cecil, Scientist (Soil Science), CPCRI Regional Station, Kayangulam for the valuable suggestions and help rendered during this study.

REFERENCES

- GEORGE, M. V. and RADHA, K. 1973. Computation of disease index of root (wilt) disease of coconut. *Indian J. Agric. Sci.* 43 (4): 366-370.
- MENON, K. P. V. and PANDALAI, K. M. 1958. *The Coconut Palm—A Monograph.* Indian Central Coconut Committee, Ernakulam, India. pp. 384.
- RADHA, K. and LAL, S. B. 1972. Diagnostic symptoms of root (wilt) disease of coconut. *Indian J. Agric. Sci.* 42 (5): 410-413.