

A Lightning Strike of Coconuts in New Guinea*

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ABSTRACT.

The effects are recorded of a lightning strike on coconuts in a plantation on an island off the New Guinea coast. There was a delayed expression of symptoms (mainly frond break and frond droop), the most severe damage being apparent on 19 palms (including the struck palm) four months after the strike. Six palms died within 100 ft. of the struck palm but others within this radius were either apparently unaffected or showed only mild to severe symptoms. The recovery period of the 12 affected palms which did not die coincided in the main with a four-month drought which may have prevented the development of secondary rots. The site was under observation for 31 months.

INTRODUCTION.

In response to an appeal to planters to advise the Department of the occurrence of lightning strikes in coconut plantations or in cacao, one planter reported that a strike had occurred on his plantation and kindly agreed to keep the area under observation and to report regularly on the onset of symptoms. The following notes and diagrams have been prepared from the data made available by him.

The strike was reported by indigenous eye witnesses to have occurred during a very severe electrical storm on 20th April, 1965, on a coconut plantation on an island off the north coast of New Guinea. The struck palm was one of a pair growing close together side by side, both of approximately the same height as far as could be remembered and part of a planting of palms at 30 ft. by 32 ft. spacing, although a little out of alignment near the seashore.

Notes on the symptoms during the subsequent four months and at seven, eleven, 23 and 31 months, are as follows:—

24th April, 1965.

Very little aerial damage was apparent, but the struck palm (marked S in *Figure 1, A*) had two large pieces torn out of its rather exposed root system. Three palms in its vicinity showed slight frond droop.

A few days later there was little change and local New Guineans living close to the

strike reported to the planter that visible damage¹ was not observed until well into the second week.

26th May, 1965.

At this inspection the struck palm was scored as dead, with another dead palm next but one away, and a third palm (the right hand lower corner palm in *Figure 1, B*) showing very heavy damage. Eight palms including the 'twin' of the struck palm were severely affected and three were mildly affected, as shown in *Figure 1, B*.

19th June, 1965.

Only a little further change had occurred at the time of this inspection. It appeared to the planter, therefore, as if the greatest visible change occurred during the first two to four weeks after the strike. A few trees showed serious deterioration and a few more showed mild effects (*Figure 1, C*). At this stage the planter was convinced that quite a number of palms would eventually die.

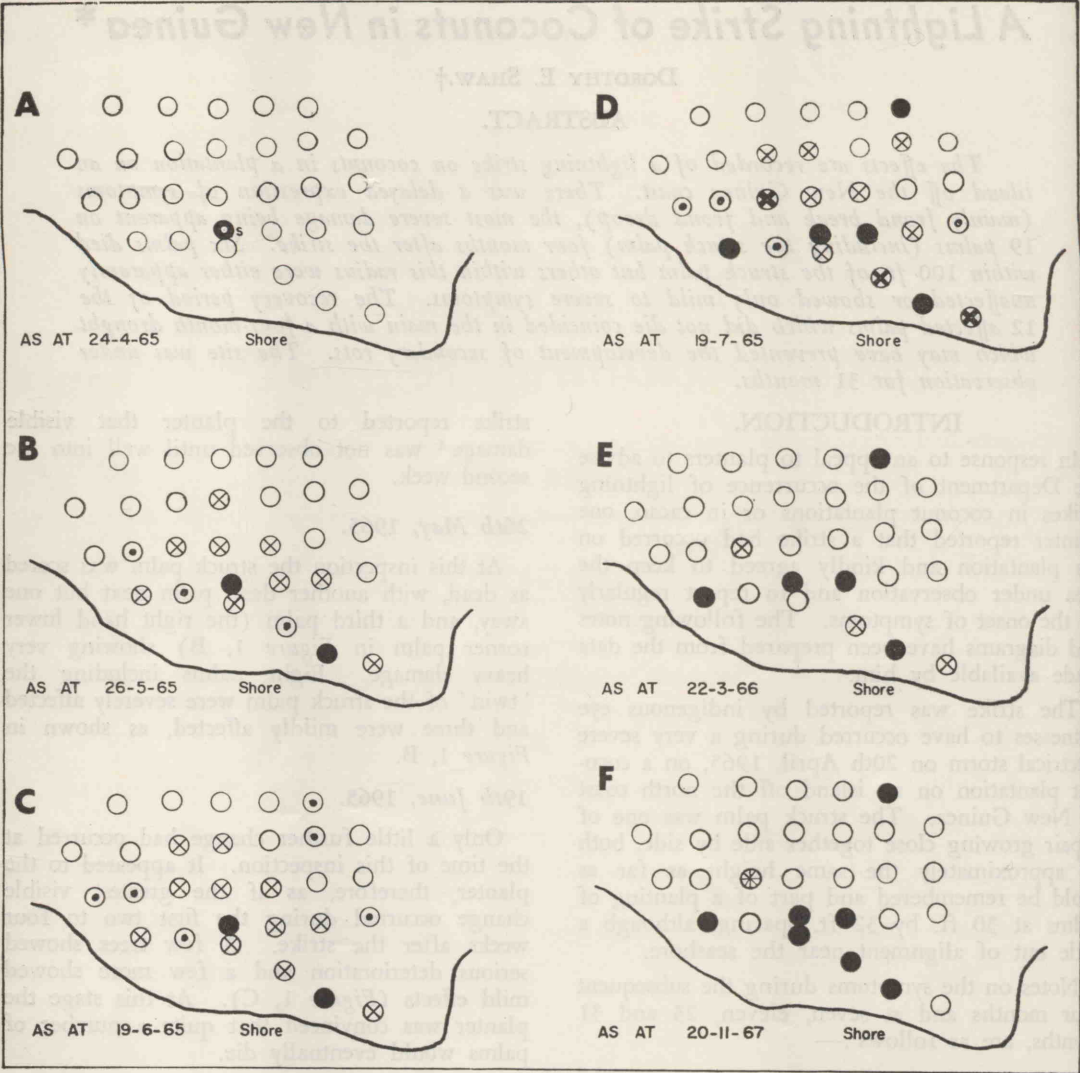
19th July, 1965.

At this inspection three more palms were dead, one of them (right hand top corner in *Figure 1, D*) being some distance from the struck palm and another being removed by one palm. Three

1 Affected palms showed either frond break and/or frond droop, although precise numbers of affected fronds were not recorded by the planter. Unfortunately, no detailed examination by a pathologist of the affected parts of the struck and surrounding palms was possible at any time during the recordings because of the relative inaccessibility of the plantation and the distance from Port Moresby.

* Compiled from notes submitted by a New Guinea planter.

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- HEALTHY PALM
- PALM STRUCK ON 20-4-65
- ⊗ PALM BLOWN OVER BY WIND
- ⊙ PALM MILDLY AFFECTED
- ⊗ PALM SEVERELY AFFECTED
- ⊗⊙ PALM APPARENTLY DEAD, LATER RECOVERED
- PALM DEAD

Figure 1.—The effect of lightning strike on coconut palms over a period of 31 months.

other palms considered dead at this stage later recovered, and these are distinguished in Figure 1, D. One other palm which had been only mildly affected previously showed more severe

damage. The 'twin' to the struck palm, however, appeared no worse than at the previous two readings, although damage was still severe. At this stage 19 palms were affected.

19th August, 1965.

No material change in the position was observed except that some of the affected palms did not appear to be quite as severely damaged as at previous inspections and the planter thought that some might even recover.

22nd November, 1965.

Observations were resumed in November, when the planter returned from leave. From previous experience of strikes, which are frequent in this area, the planter expected considerable deterioration to have occurred. He reported amazement, however, at the lack of deterioration in affected palms. The 'twin' of the struck tree appeared certain to survive, and the palm (right hand side lower corner *Figure 1*) which in July had appeared certain to die was developing a new shoot.

It should be mentioned that the four months prior to this reading constituted the worst recorded drought in the area, with the entire period practically rainless; usually at least four inches per month is recorded during that period. The drought reduced the total rainfall for 1965 to 112 in. whereas the average rainfall is said to be approximately 145 in. per annum. During the drought period, however, the sandy soil in which the plotted palms were growing had ample ground water draining to the sea from a nearby swamp.

The relatively dry period following the strike perhaps prevented or reduced secondary fungal and bacterial attacks which might, under conditions of higher rainfall, have administered the *coup de grace* to the affected palms.

22nd March, 1966.

It was evident at this inspection that deaths were confined to the struck palm plus four others, only one of which was within 30 ft. of the struck palm and the furthest was about 100 ft. away on the outskirts of the affected area. All the slightly damaged palms had recovered, while some which at earlier inspection appeared certain to die were producing new fronds. The three palms which had appeared dead in July, 1965, had recovered but were far from healthy-looking and were still devoid of nuts. One palm (unspecified) had what may have been 'stem bleeding' as described by Sharples (1933) —in the present case the 'stain' was stated to

"transfer easily enough to a damp handkerchief and if not applied too heavily was light brown in colour".

The planter was again amazed at the recovery of the palms, many of which he was sure would die when examined nine months previously.

31st March, 1967.

The palm in the right hand lower corner of *Figure 1* survived, and although its canopy was still in very poor shape it had started to bear nuts again. Two of the palms which had appeared dead in July, 1965, were now carrying a reasonable crop of young nuts, although the cabbages were less dense than those of the surrounding palms. The third palm which had appeared dead in July, 1965, had been blown over by the wind. The 'twin' to the struck palm appeared to be in reasonable condition (*Figure 1*, E).

20th November, 1967.

After an interval of eight months, the planter revisited the site and found that a further two palms had died and their tops had fallen off. They were the twin of the struck palm and the one to the right of it on the beach. The New Guineans living nearby stated that no further strikes had occurred. A third tree, the palm on the left of the struck tree, appeared healthy to the planter although the locals stated that it would die too. When pieces of the cabbage were collected and examined by the planter he found them badly attacked by *Hispid*.

DISCUSSION.

It should be noted from the above records and the *Figure* that—

there was an effect on surrounding palms as well as on the palm said to have been struck by lightning;

three months after the strike, symptoms were beginning to show upon hitherto apparently unaffected surrounding palms. This is similar to delayed effects of strikes as previously reported by Sharples (1933) for Estate A, by Dwyer (1936), and by Charles (1960);

six palms which ultimately died were growing from three to one hundred ft. away from the struck palm, which died first. Twelve other palms within that radius, however,

showed only mild to severe symptoms; the 'twin' to the struck palm was one of them, although it eventually died within two-and-a-half years; ten palms were apparently unaffected;

the recovery of some of the 12 affected palms which did not die was evident by the fourth month, and the recovery increased with time. Recovery of affected palms was not recorded by Sharples (1933) or by Charles (1960); and

the recovery period coincided with a drought which may have prevented secondary organisms from causing rots in some of the affected palms.

ACKNOWLEDGEMENTS.

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