

Palm Oil, Palm Kernels and *Elaeidobius* — Part 1

T.P. Pantzaris

Ever since I can remember I have thought in pictures. Given any three sets of numbers I immediately visualise them on a graph and try to find out whether they fall on a straight line or curve. It never occurred to me to worry about it until the other day when I read that psychologists believe people of low intelligence think in terms of pictures.

Pre-weevil Period, 1970 – 1981

Since both palm oil (PO) and palm kernels (PK) come from the same fruit and since the genetic basis of the Malaysian palm trees and the environmental factors are so obligingly uniform, there should be a good linear relationship between PO and PK production over the years. Indeed my learned colleagues at the PORIM biology division with degrees in botany and other mysterious subjects, tell me that the Tenera type of fruit consists of 80% pericarp containing 49% oil and 8% kernels. Assuming the same extraction efficiency for both, then if my calculator (on loan from PORIM) is correct, the ratio of PK/PO production should be about 20.4%. But this information was based on pre-1981 data when weevils were those one found in imported rice. So I asked one of our ever patient AROs to collect some figures from the Dept. of Statistics, KL and other sources and these are given in *Table 1*.

Now, I am sure my readers are much more intelligent than I am and can read a lot into 15 rows and 4 columns of figures, but to me a row of figures is . . . just a row of figures and being the kind of fellow I am, I proceeded promptly to put them on a graph so as to get a clear picture of what they meant (never mind the psychologists). See *Figure 1*.

Graph A shows that for the six years 1970 – 1975, there was an extremely high correlation between PK and PO production, all the points falling very precisely on a straight line. For the six subsequent years 1976 – 1981, the latter being the year of introduction of the weevil into Malaysian plantations, there are some slight deviations, but overall the fit is still very good. The average PK/PO production ratio (\bar{y}/\bar{x}) was 21.0%.

Those readers with a more mathematical frame of mind will no doubt wish to know the equation of the least square trend line. There is undeniably something very satisfying about an equation relating two natural phenomena. It amounts to discovering a law of nature and this is what science is all about. The equation is

$$\begin{aligned} \text{PK} &= 0.2135 \text{ PO} - 4\,983 && \text{Equation 1} \\ r &= 0.999 \quad (n = 12), \end{aligned}$$

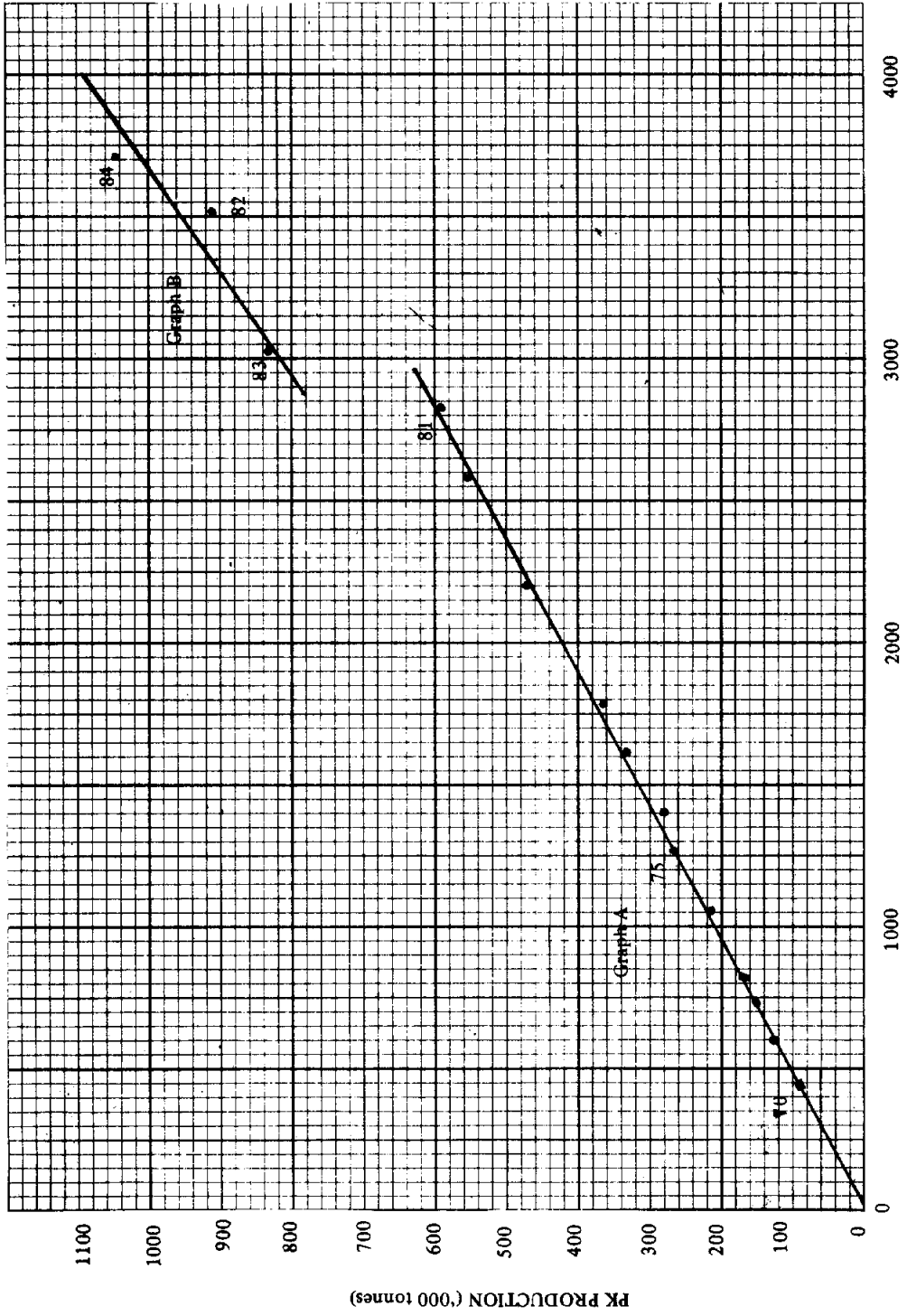
Post-weevil Period, 1982 – 1984

After the introduction of the weevil, i.e. for the three years 1982–1984, there is a sudden increase in the slope of the graph from 0.2135 to 0.2744 confirming the observations of the planters that kernel production became proportionally greater (see graph B).

The average PK/PO production ratio is now 27.2% and the least square trend line has the equation

$$\begin{aligned} \text{PK} &= 0.2744 \text{ PO} - 6\,736 && \text{Equation 2} \\ r &= 0.921 \quad (n = 3) \end{aligned}$$

With only three points on the curve this equation cannot be used with very much con-



PO PRODUCTION ('000 tonnes)

Figure 1. PK vs PO Production, East and West Malaysia, 1970 - 84

TABLE 1. PRODUCTION OF PO, PK AND PKO, EAST AND WEST MALAYSIA (tonnes)

Year	Palm Oil (PO)	Palm Kernels (PK)	Palm Kernel Oil (PKO)
1970	431 069	92 300	—
1971	589 090	126 500	—
1972	728 958	150 600	—
1973	812 614	167 100	—
1974	1 045 975	215 400	—
1975	1 257 573	265 000	—
1976	1 391 965	281 088	—
1977	1 612 747	334 791	142 496
1978	1 785 525	367 540	142 294
1979	2 188 699	475 007	195 581
1980	2 573 173	557 026	222 289
1981 (weevil introduction)	2 822 144	588 783	243 354
1982	3 510 920	909 918	336 978
1983	3 016 481	834 570	360 229
1984	3 714 795	1 045 603	423 390

Source: 1) PORLA
 2) Dept. of Statistic, Kuala Lumpur
 3) Oil World.

confidence but it is the best we can do for the present.

The *Elaeidobius* family has done some interesting things to palm kernel oil production

also, as our customers for this oil overseas will be pleased to know.

This will be the subject of Part 2, of this article.