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SEPTEMBER 1974
KDN 7562 Vol. 50, No. 582

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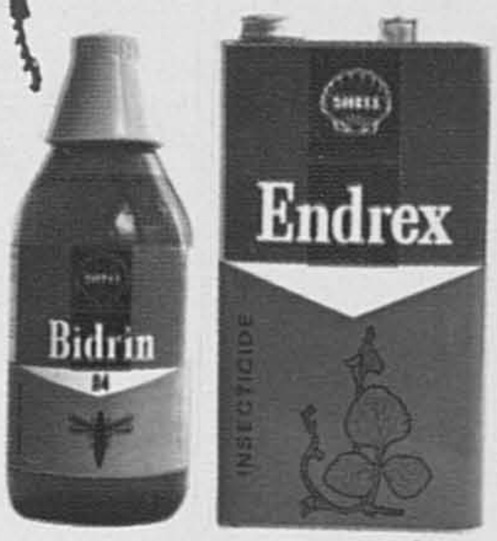

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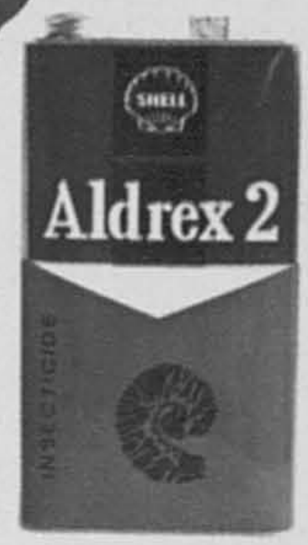

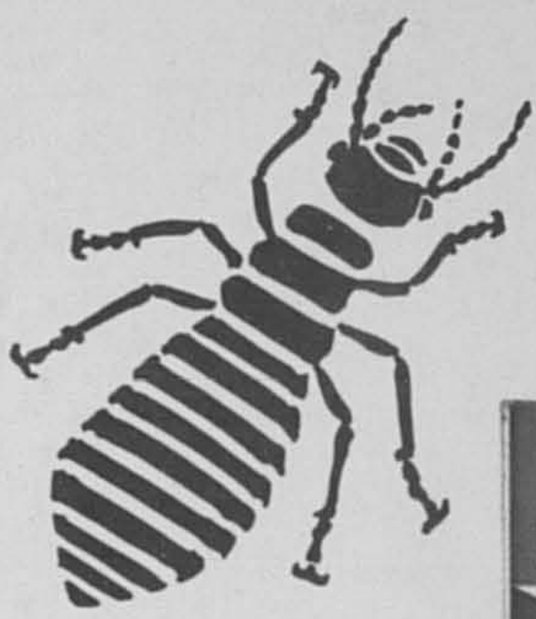

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The Planter

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MAGAZINE OF THE INCORPORATED SOCIETY OF PLANTERS

- *The Planter* is published monthly at 1, Pesiaran Lidcol, Kuala Lumpur 04-06, Malaysia

- It features original technical articles for the practical planter in tropical agriculture, papers relating to the Society's Technical Education Scheme, and other material of wider and more general interest

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Contents

September 1974

OUR NEW COVER

shows a Piper Pawnee of Malaysian Air Charter spraying pesticide against grasshopper attacks in young oil palm. The photograph appears by courtesy of Mr Brian J Wood FISP

Contents

Editorial:

Inflation and information

Inflation must surely be the most frequently used word in the world at the present time. Everyone is talking inflation and citizens and governments everywhere are trying to cope with the problems arising from it.

Most western governments have declared inflation to be their number one problem and Britain has gone to the polls with this bogey as the main issue. It is generally acknowledged that the chief cause of the affliction, certainly during the past 12 months, is the price of crude mineral oil.

The British electorate is often said to be the best-informed in the world and, on the information available to them, they have had the task of electing a government which they hope is the most capable of solving what is admittedly the major problem facing that nation—and a good many other nations—the adverse balance of trade largely attributable to the quadrupling of the crude oil price a year ago.

At the time this happened, we were belaboured with figures related to the cost per barrel, yet few told us how much 'a barrel' contained. The price of fuel oil and spirit rose, but not to the extent which crude had been raised; we had to presume that the difference had been 'absorbed' by the petroleum companies, but some of the profits declared since that time might indicate that the whole of the crude increase could have been absorbed.

The trouble with this oil business is that the public cannot obtain the information to form any kind of judgement, and included in that public are the servants of the media. It is easy to gain the impression that the information which would enable the average citizen to work out the profitability of an average barrel of crude oil is deliberately denied him.

At the time when the oil price was swingeingly increased, a Malaysian reporter made a tentative effort to open the door of enlightenment by asking some appropriate official if Malaysian-produced oil could not in due course replace the imported commodity. The door was not quite slammed in his face, but he was effectively put off with a mild 'blinding with science' about sulphur content.

Most of us know some, and some of us know most of the products which can be made from crude mineral oil; the average man who knows all the products must surely be of a very small minority. Let us try to set down some of the questions to which the answers are essential in order to express responsible opinion on the economics of crude mineral oil and the reasonableness or otherwise of the present price, in a world context.

How do the various grades of crude emanating from different countries vary in composition and how is the extraction ratio of the various products affected? If the primary product required is, say, 100 octane spirit, how much of this comes from

one barrel, and what can be produced from the residue? Using all the contents of a barrel to maximum profitable advantage, what would be the selling price of all the produce? On the other hand, what would the answer to this question be if the primary requirement was synthetic rubber, nitrogenous fertiliser or detergents?

The encyclopaedias give us all sorts of technical information such as that there are three main types of crude petroleum: paraffins, naphthenes and aromatics, and a wealth of technical information with which the politician can fend off the reporter trying to sort out the economics. As far as we can see, the reader is doomed to disappointment and ignorance.

How is the ordinary man in the street (the voter) to formulate reasoned answers to such questions as 'Is it immoral in this day and age to make synthetic rubber from oil which might be more beneficially turned into herbicides, insecticides or more important still, fertilisers?' The crisis in fertiliser supply and cost derives from current shortages and high prices of raw materials, including petroleum, plus greatly increased freight rates and "under-investment in fertiliser production capacity caused by several years of disastrously low returns to the industry", according to a report by the FAO/Fertiliser Industry Advisory Committee of Experts; an FAO spokesman has said that fertiliser prices have doubled and in some cases trebled since the end of 1972.

Is it immoral to use the diminishing oil supplies to make synthetic rubber when the natural rubber industry has the capacity to supply the world's needs, and with considerably less, if any, pollution?

If the organisation of petroleum exporting countries (OPEC) can put a fixed price per barrel upon their varying commodity, why cannot be organisation of natural rubber countries (ANRPC) do the same with theirs? Why, in view of all this, is the rubber price so much lower now than six months ago, and why does it, fluctuate so much?

OPEC spokesmen, including the Shah of Iran, have said that the sudden and massive increase in the oil price was a long overdue measure to bring it into line with that of other raw materials, thereby narrowing the gap between living standards in the oil-producing countries and those which are mainly consumers. An odd point here to the uninformed layman is that the most vociferous complainer about the oil price is, from the statistics available to us, the world's largest producer—the United States.

China's representative at the United Nations has just supported the increase in oil price by saying that it redressed years of exploitation of the under-developed countries by the international oil giants. This is the kind of assertion which it is difficult to counter unless one has a mass of statistics available. If the oil companies paid above-average wages and sold their products at a price compatible with other items in the COL index, which they did, it is hard to make the charge stick. However, one must have the figures at hand to counter such vague, emotional statements.

In a recent letter to the editor of *The Economist*, the writer, although in another context, says something very pertinent to our topic—'Unfortunately, the average layman cannot lay his hands on enough information about what is happening behind the scenes of international politics……". The oil and inflation problems are not only bound up with international politics—they are the products thereof.

Who will start the ball rolling by sending us a paper on 'The economics of fractionation of mineral crude oil'? Although we are primarily an agricultural publication, the subject is one so affecting all mankind that we would be happy to publish it.

Democracy flourishes on informed public opinion; informed public opinion relies on information. If governments, press and public are to unite in the fight against inflation, enlightened opinion must be forthcoming from all sectors; this cannot be achieved without wide dissemination of the economic facts, particularly those concerning petroleum.

The news reporters of the world are forever defending themselves against charges of invasion of privacy (or *vide* Nixon, 'confidentiality') by saying that their duty to inform the public is paramount, if not sacred. In this context we would paraphrase Alistair Cooke by replying that the realities of the oil/inflation situation are infinitely more important than the lurid and properly private details of Mrs Ford's mastectomy.

Let the servants of the media and therefore the public get their priorities right and, if privacy needs to be invaded in the public interest, give priority to that of corporate bodies rather than individuals.

We apologise for the late appearance of this issue of "*The Planter*", it was the fault of power failure at our printers.

Planter, Kuala Lumpur **50**: 258–262 (1974)

Aerial application of herbicides by helicopter for weed control in sugarcane

BRIAN H. WEBB*

SUMMARY

Helicopters have been tested on sugarcane, oil palm and rubber in Malaysia: this trial showed that the aircraft's application to sugarcane for weed control is as effective as that of ground-rigs.

The treatments resulted in a reduction of weed cover to not more than 36% compared with 89% for the untreated control.

Adequate ground support equipment and efficient staff is an important requirement for commercial application.

Provided that work-rates are maintained above 120 acres per hour, the cost of application by helicopter would be approximately M$4.00 per acre. The helicopter is capable of covering 600–900 acres per day if efficiently utilised.

INTRODUCTION

Over the past 10 years there have been many attempts to introduce agricultural aviation to the Malaysian agricultural industry, but with mixed results. The helicopter appeared on the scene only recently, the first trials being conducted in 1971. It is essential, if aerial application of chemicals for any of the uses such as fertilizing, weed control, pest control, disease control or crop management (*e.g.* defoliation) is to be successful, that the operations are well planned and efficiently carried out.

The object of a trial (of weed control in sugarcane) carried out in Perak was to study the speed of operations, particularly with the poor ground conditions of monsoon periods. It was also hoped to demonstrate that the production rate of the helicopter resulted in costs of application lower than those for ground-rigs. The productivity of a helicopter is only economic when the application rate is below 6.0 gal (US), or 50 lb per acre, and when the hourly production is more than 120 acres.

MATERIAL AND METHODS

For this evaluation a Bell 47-G5 helicopter fitted with a 21-ft boom Agmaster spray system was used to apply the herbicide. The boom was fitted with D46 nozzles with swirl plates and the system was calibrated to deliver 32 gal (US) per minute which was obtained at a pressure of 40 psi. Flying at 60 mph, 3–5 ft above ground level, a swathe-width of 50 ft and an application rate of 6.0 gal (US) was achieved. This calibration of the swathe-width was carried out using Rhodomin B die sprayed across a 4-in. wide strip of calculator print-out tape.

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* Agricultural Engineer, Faculty of Agriculture, University of Malaya.

Knapsack sprayers fitted with hollow cone-nozzles and calibrated to apply 60 gal per acre were used to spray the ground application treatments (see below *ii* and *iii*).

Ground support equipment and staff, a makeshift for this trial, were supplied by the plantation management and included men with marker flags to indicate each run by the helicopter.

Measurements of ambient temperatures and wind velocities were made by a hot-wire anemometer at the time of each treatment application. The results of these measurements are shown in *Table 1.*

Table 1. Meteorological data: wind and temperature

Time	*Wind speed (mph)*	*Wind direction*	*Temperature °F*
0820	1.0 — 1.4	SE	80
0915	0.7 — 1.7	SW	89
0925	1.0	SW	88
0950	00	—	92
1115	1.4 — 4.7	SW	94
1125	1.4 — 6.8	SE	88
1155	3.8	SE	92
1250	2.7 — 3.8	E	92
1315	3.0 — 3.4	ENE	93
1330	2.0 — 4.7	S	91
1350	2.4 — 3.4	NE	92

The chemicals used were proprietary herbicides supplied by Ciba Geigy and were broad-spectrum chemicals for control of both broadleaves and grasses. The treatments tested were: —

i. Control.

ii. "Cotoran 80" 2.0 lb ai/ac. ground application.

iii. "Gesaprim" 1.2 lb ai/ac. + "Gesopax" 1.2 lb ai/ac. ground application. cation.

iv. "Cotoran 80" 2.0 lb ai/ac. aerial application.

v. "Gesaprim" 1.2 lb ai/ac. + "Gesopax" 1.2 lb ai/ac. aerial application.

The plots were 150 ft wide, 1000 ft long, and each treatment was replicated three times.

Weed counts were taken from ten 3 ft × 3 ft squares in each plot at the time of spraying and at weekly intervals up to 8 weeks when the crop had sufficiently shaded the interrow space.

The rate of work was also measured by timing of loading, ferrying to the field, application and return to the loading site.

RESULTS

The effectiveness of each treatment is shown in *Fig. 1* which is a graph of the weed counts over the 8-week measurement period.

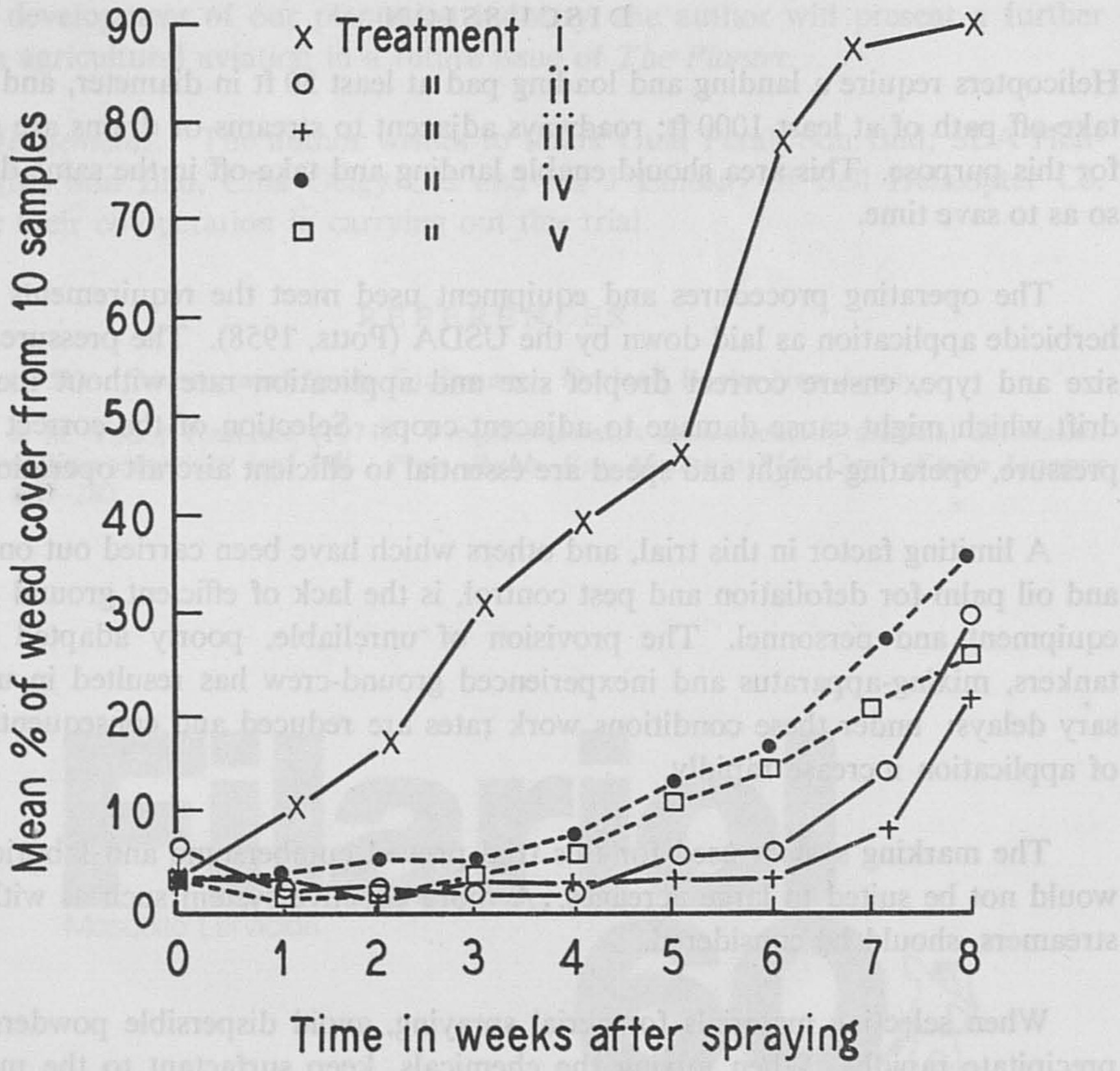

Figure 1. Effect of spraying technique on weed control in sugarcane

There is no significant difference between the results of ground and aerial systems of application. The aerial system is effective at maintaining the weeds under control. The "Gesaprim + Gesopax" chemical was more effective than Cotoran '80'.

One of the chemicals had a surfactant added to it which caused excessive foaming and led to difficulty in maintaining working pressure towards the end of each load.

Contamination in the supply-tanks of the ground-support equipment caused a serious blockage of the aircraft spray rig and resulted in failure to complete a further trial on brush control.

The measurement of work rate showed that turning time at the end of each run was only 12 seconds and a work rate of 2.65–3.5 ac/min was achieved inclusive of ferrying and loading. This is equivalent to 160–210 ac/hr. This high rate was made possible by the loading site's situation at the edge of the trial field.

The wind and temperatures were within tolerable limits for this operation. Potts (1958) recommends a maximum wind-speed of 6.00 mph to prevent excessive drift of spray material.

DISCUSSION

Helicopters require a landing and loading pad at least 50 ft in diameter, and a clear take-off path of at least 1000 ft; roadways adjacent to streams or drains are suitable for this purpose. This area should enable landing and take-off in the same direction so as to save time.

The operating procedures and equipment used meet the requirements of safe herbicide application as laid down by the USDA (Potts, 1958). The pressure, nozzle size and type, ensure correct droplet size and application rate without the undue drift which might cause damage to adjacent crops. Selection of the correct nozzle-pressure, operating-height and speed are essential to efficient aircraft operation.

A limiting factor in this trial, and others which have been carried out on rubber and oil palm for defoliation and pest control, is the lack of efficient ground support equipment and personnel. The provision of unreliable, poorly adapted pumps, tankers, mixing-apparatus and inexperienced ground-crew has resulted in unnecessary delays: under these conditions work rates are reduced and consequently costs of application increase rapidly.

The marking system used for this trial proved cumbersome and laborious and would not be suited to large acreages. A more effective system such as with paper streamers, should be considered.

When selecting materials for aerial spraying, avoid dispersible powders which precipitate rapidly. When mixing the chemicals, keep surfactant to the minimum effective quantity so as to avoid foaming; for the same reason, chemicals with 'built-in' surfactant should be tested beforehand and, given a choice, the least foamy selected.

At the work rate achieved and considering ferry-time to and from the plantation, the cost per acre should be not more than M$4.00. However, if the work-rate drops to 100–120 ac/hr this cost could rise to $6.00–$7.00. Allowing for the occurrence of thunderstorms, and at times high wind-speeds in the mid-afternoon, an average day's work should be 4–6 hr which should make possible a coverage of 600–900 acres. Team work is the essential ingredient in achieving the most economic application cost.

There is no doubt that spraying by helicopter can achieve efficient weed control in sugarcane and, especially when ground conditions do not permit the use of ground-rigs and time is an important factor, this technique of weed-control deserves serious consideration.

This is only one application of agricultural aviation, but there are many others which should be considered for Malaysian agriculture; defoliation in rubber (Rao & Azaldin, 1973), pest control in oil palm and fertiliser application in oil-palm, just to mention a few. As this is a very timely subject to consider at the present stage of development of our plantation industry, the author will present a further paper on agricultural aviation in a future issue of *The Planter*.

Acknowledgements. The author wishes to thank Gula Perak Sdn Bhd; SEA Helicopters (M) Sdn Bhd, Ciba Geigy Ltd and Mr J Lindsay of Bell Helicopter Co. USA for their co-operation in carrying out this trial.

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Planter, Kuala Lumpur **50**: 263–272 (1974)

A review of the Malaysian canned pineapple trade

Y. C. WEE* AND T. H. TAY†

THE EARLY DEVELOPMENTS

The Malaysian pineapple industry had its beginnings in the late 19th century in Singapore. The pineapple plants were then grown in the interrows of coconuts, areca nuts and other fruit trees. With the widespread cultivation of rubber, pineapple became its popular intercrop. However, the rubber industry suffered a setback in 1931; there was a reduction in rubber acreage and this in turn resulted in a decline in pineapple areas (Wee, 1970a). The pineapple industry was then of some importance to the economy of the country and efforts were made to maintain its productivity. Sole cropping was encouraged and by 1933 there were 19,739 acres in the three major growing areas of Singapore, Johore and Selangor (Johnson, 1937).

The early pack was known to the overseas buyers as Singapore pineapple. As cultivation shifted to Johore and more canners became established there, the pack gradually became known as Malayan pineapple. This term will be used throughout to indicate pineapple grown mainly in West Malaysia and canned both in West Malaysia and Singapore.

THE PRE SECOND WORLD WAR PERIOD

The pineapple industry took its rise somewhere about 1904. The export for that year was about 11,200 ton valued at M$2.47 million (Teo, 1963). This volume increased gradually until it reached a peak of 65,800 ton with a value of M$9.93 million just before the Second World War in 1939 (*Table 1*). British Malaya as West Malaysia was then known, was the second largest producer after Hawaii. The main market for the Malayan pineapple was then the United Kingdom. The product dominated the scene as it was the cheapest in the market and therefore became accessible to a large portion of the public which could not afford the more expensive Hawaiian and South African product.

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Table 1. Yearly exports of Malayan canned pineapple: 1904–1941

Year	*'000 long ton*	*M$ million*
1904	11.2	2.47
1905	13.7	2.79
1906	17.7	3.25
1907	21.2	3.27
1908	17.9	2.65
1909	16.1	2.15
1910	12.2	1.80
1911	13.0	2.48
1912	14.6	3.14
1913	18.8	3.13
1914	17.4	2.62
1915	20.3	3.14
1916	19.6	4.42
1917	6.2	1.57
1918	2.7	0.84
1919	6.4	3.29
1920	8.0	7.18
1921	16.6	6.21
1922	17.8	6.70
1923	22.2	5.88
1924	30.5	8.87
1925	33.6	8.24
1926	31.6	7.67
1927	31.2	8.30
1928	36.1	8.42
1929	45.7	9.23
1930	45.1	7.86
1931	46.3	7.08
1932	51.6	7.91
1933	46.3	6.29
1934	51.8	7.03
1935	57.5	8.33
1936	59.4	8.69
1937	62.6	8.83
1938	56.9	7.26
1939	65.8	9.93
1940	40.2	8.44
1941	15.1	3.01

After Barnett, 1949

In 1925, 29.5% of the total imports of canned fruits into the United Kingdom was pineapple (Anon., 1931). The Malayan pack formed 81% of the canned pineapple imported into the country in that year. The other 19% was mainly from the United States, Hawaii and South Africa (*Table 2*). The dependence of the Malayan pineapple on the United Kingdom is seen in the yearly export figures to the various countries (*Table 3*). About three-quarters of the pack were exported to that country. The remaining portion was distributed widely, the more important markets were Canada, New Zealand, the United States, Europe and India.

Table 2. Imports of canned pineapple into the United Kingdom: 1925–1933
('000 cwt)

Year	Malaysia		South Africa		USA inc. Hawaii		Others		Total	
	Cwt	%	Cwt	%	Cwt	%	Cwt	%	Cwt	%
1925	604	80.9	20	2.6	119	16.0	3	0.5	746	100
1926	502	82.5	22	3.6	83	13.6	1	0.3	608	100
1927	473	79.3	16	2.7	104	17.4	3	0.6	596	100
1928	515	81.7	12	1.8	97	15.4	6	1.1	630	100
1929	647	84.4	13	1.7	102	13.3	4	0.6	766	100
1930	608	87.1	4	0.6	78	11.2	8	1.1	698	100
1931	676	87.9	5	0.6	82	10.7	6	0.8	769	100
1932	891	92.2	4	0.4	51	5.3	20	2.1	966	100
1933	711	89.7	4	0.5	47	5.9	31	3.9	793	100

Table 3. Exports of Malayan canned pineapple: 1932–1936
('000 long ton)

Country	1932		1933		1934		1935		1936	
	ton	%	ton	%	ton	%	ton	%	ton	%
UK	55.7	84.3	45.8	77.1	51.1	76.7	54.5	73.7	54.6	71.5
Canada	2.9	4.4	6.2	10.4	7.9	11.9	8.9	12.0	11.5	15.1
New Zealand	1.5	2.3	1.5	2.5	2.1	3.2	2.2	3.0	2.7	3.5
USA	0.8	1.2	0.6	1.0	0.6	0.9	1.0	1.4	1.7	2.2
Br. India	0.5	0.7	0.7	1.0	1.0	1.5	0.8	1.1	1.0	1.3
France	0.9	1.4	0.6	1.0	0.5	0.7	0.4	0.5	0.9	1.2
Netherlands	1.3	2.0	1.4	2.5	0.4	0.6	2.3	3.1	0.8	1.1
Germany	0.4	0.6	0.5	0.8	0.4	0.6	0.5	0.7	0.4	0.5
Egypt	0.1	0.1	0.2	0.3	0.2	0.3	0.2	0.3	0.4	0.5
Others	2.0	3.0	2.0	3.4	2.4	3.6	3.1	4.2	2.4	3.1
Total	66.1	100.0	59.5	100.0	66.6	100.0	73.9	100.0	76.4	100.0

After Johnson, 1937

The industry experienced a difficult and unstable period during the late twenties. Cost of production fluctuated violently due to the day-to-day competition for the fresh fruits. This made it almost impossible for an orderly disposal of the pack at fixed prices. Prices were erratic. The speculative selling and unregulated competition among the packers often forced prices down to unrealistic levels. In spite of these troubles the industry enjoyed a period of prosperity until the early 1930's when rapidly increasing fruit production coincided with depressed conditions in the world's canned fruit markets. It was then that the dependence on low price rather than sound quality, and the failure to evolve any efficient organization to control production and regulate marketing had their effects.

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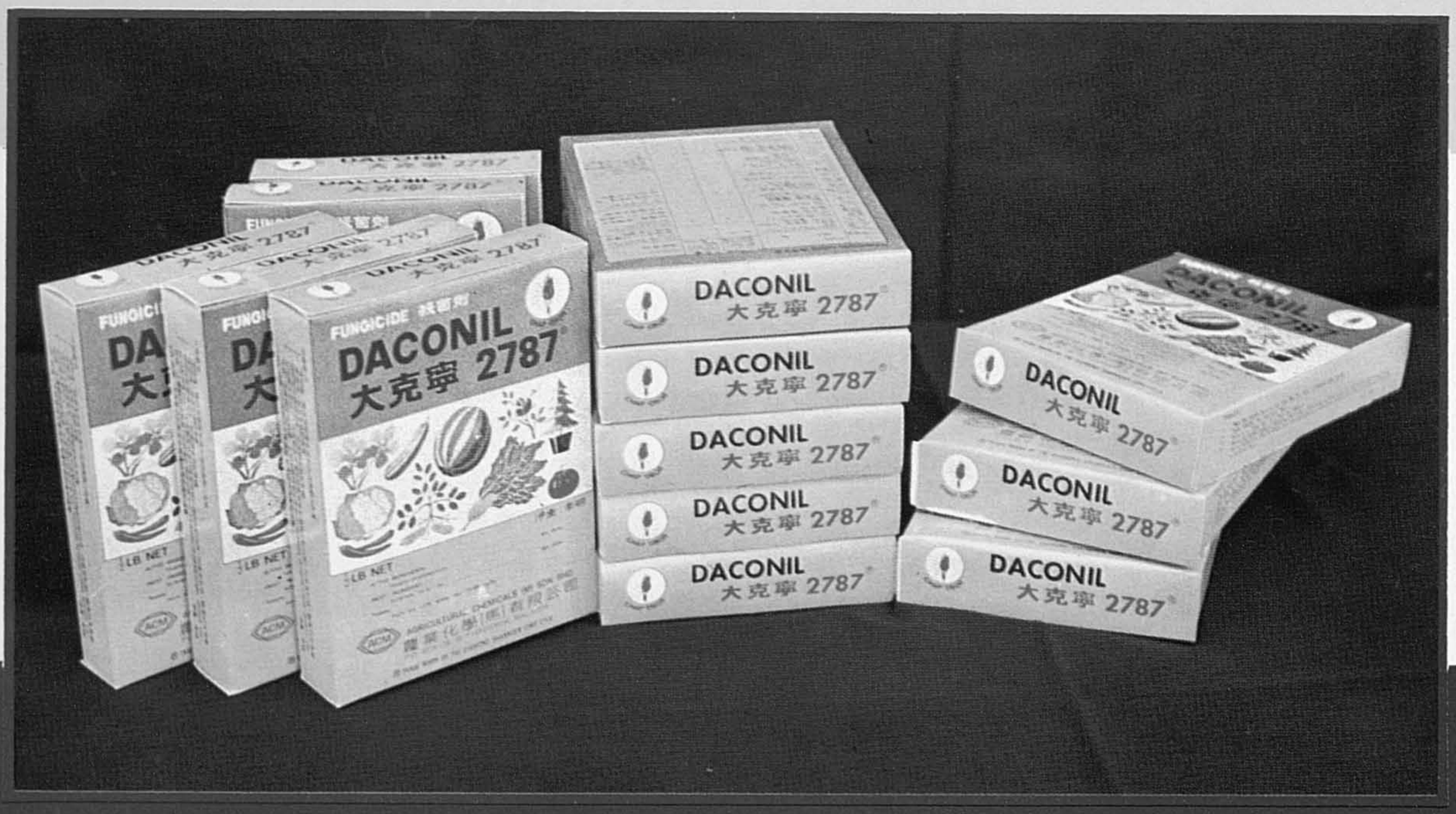

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In 1934 the Pineapple Industry Ordinance was enacted giving the Government wide powers to regulate the industry. Canneries were henceforth required to comply with certain regulations before they were registered. Sanitary measures and processing methods were subsequently improved and equipment modernized. A packers association emerged in 1938 in the form of "The Central Board of Pineapple Packers of Malaya" following a sharp price decline that year. The first concern of the Central Board was to establish a higher price level for the pack by controlling production on a quota basis and by centralising the sales of canned pineapple in the hands of its trade committee. With these measures prices increased by about 30% within nine months. Thus when the Second World War broke out in 1939 the industry was in the process of evolving a more satisfactory organization.

THE JAPANESE OCCUPATION

The Japanese occupation of British Malaya and Singapore (February 1942 to August 1945) saw the pineapple industry coming to a standstill. The pineapple areas were abandoned and consequently reverted to secondary jungle. Pineapple packing was discontinued and the canneries, except for one which was used for other products, were abandoned.

THE POST-SECOND WORLD WAR PERIOD

The canning of pineapple resumed in November 1946 after a 5-year interruption. Only one cannery was in operation and its total pack of 19,000 cases was sold almost entirely to the United Kingdom. The favourable price obtained attracted other canners to recondition their factories. By 1948 four more canneries were in operation. The United Kingdom still remained the most important outlet for the Malayan pack. The product was still popular—its sweet and golden flesh was more liked than that of the Hawaiian. The yearly exports of canned pineapple to this, the traditional market, did not however reach pre-war levels.

Efforts were made to put the industry under strict controls. To discourage those packers interested only in exploiting the favourable prices for the product and not prepared to make long-term investments, the Johore Committee, entrusted with the resuscitation of the industry, recommended that planting by packers should be compulsory. Each cannery was required to be supported by a minimum of 1,500 acres. Following pre-war regulations, the canneries were also required to modernize their methods of canning and their machinery.

During the post-war years canned pineapple was in demand due to a world-wide shortage. Ambitious planting programmes were started in Malaya and towards the end of 1956 similar programmes were coming to fruition in South Africa, Formosa, Kenya and elsewhere (Fed. of Malaya, 1960). The world market for pineapple became over-supplied and prices fell. Exporters adopted their old practice of price undercutting to dispose of their packs and this resulted in a further decline in prices which reached an uneconomical level. To aggravate the situation the industry experienced labour difficulties.

The trouble faced by the industry as outlined above led first to the establishment of the Malayan Pineapple Industry Board in 1957 with powers to control and regulate the industry and subsequently to the setting up of a Commission of Enquiry in 1959. The Commission was to examine all aspects of the industry and to make recommendations for their improvement. One result of the Commission was the stabilization of the industry. Legislation was subsequently passed to prevent destructive internal competition between the canners and the elimination of speculation by exporters. After the period of depressed conditions in the overseas markets in 1959–60, trading improved. In 1961 the total shipment rose to 44,170 ton. This trend continued and a peak of 70,555 ton was reached in 1968. However, the record export value of canned pineapple is seen in the year 1970 when it touched M$1.8 million. Details of exports for the years 1950–1972 are given in *Table 4.*

Table 4. Yearly exports of Malayan canned pineapple: 1950–1972

Year	*'000 long ton*	*M$ million*
1950	14.7	12.2
1951	16.9	16.9
1952	11.8	12.6
1953	17.4	19.0
1954	21.6	25.3
1955	27.8	19.1
1956	30.4	31.2
1957	37.7	33.7
1958	41.5	33.3
1959	38.6	27.9
1960	37.6	26.4
1961	44.2	32.4
1962	47.3	35.6
1963	50.5	36.9
1964	52.7	38.8
1965	65.1	48.0
1966	68.7	50.0
1967	64.1	46.4
1968	70.6	48.5
1969	69.4	49.6
1970	69.1	51.8
1971	62.3	46.4
1972	65.1	49.3

The United Kingdom still provides the main outlet for the Malayan pack, although her importance has declined somewhat since the pre-war years. Before the war the UK took in 80–90% of our exports (*Table 2*). This had decreased to around 35–40% during the post-war period (*Table 5*). However, Malaysia still retains her position as the top exporter to the UK, with South Africa as the main competitor. With this decline there was a corresponding increase in efforts to find new markets. Today the Malayan canned pineapple has gained a substantial foothold in the United States. Entry into this market came only in 1957 when 13 ton with a value of M$10,850 were exported. By 1969 the United States had become the second largest market after the UK, taking 25% of our exports or 16,841 ton (Wee, 1970b). For

the years 1964 through 1968, Malayan pineapple averaged 15.5% of the US imports of the product (Low, 1969). The major country exporting to the US is the Philippines, followed closely by Taiwan. It should be noted that the Hawaiian pineapple naturally dominates the American market. The gradually increasing importance of the Philippines' product is due to American packers having interests there. Besides the UK and the US, Canada and the Federal Republic of Germany are the next important markets. The other markets with potential are New Zealand, Spain, Japan and the Middle East countries.

Table 5. Imports of canned pineapple into the United Kingdom: 1955–1969 ('000 long ton)

Year	*Malaysia*		*South Africa*		*USA and Philippines*		*Others*		*Total*	
	ton	*%*	*ton*	*%*	*ton*	*%*	*ton*	*%*	*ton*	*%*
1955	20.5	35.0	10.6	18.0	—	—	27.6	47.0	58.7	100
1956	23.3	37.9	13.4	21.8	—	—	24.9	40.3	61.6	100
1957	28.0	49.7	17.3	30.8	0.1	0.1	11.0	19.4	56.4	100
1958	31.4	44.5	26.4	37.5	0.8	1.2	12.0	16.8	70.6	100
1959	26.0	41.7	16.7	26.8	0.5	0.8	19.2	20.7	62.4	100
1960	21.3	36.2	23.5	40.0	0.4	0.7	13.5	23.1	58.7	100
1961	23.6	41.4	22.4	39.3	1.6	2.7	9.4	16.6	57.0	100
1962	24.3	36.5	22.1	33.0	8.2	12.3	12.1	18.2	66.7	100
1963	19.7	37.5	19.4	37.0	5.3	10.1	8.1	15.4	52.5	100
1964	18.6	33.0	20.6	36.4	7.8	13.8	9.5	16.8	56.5	100
1965	21.5	39.5	15.3	28.2	7.8	14.3	9.8	18.0	54.4	100
1966	26.2	41.3	17.0	26.9	9.4	14.7	10.8	17.1	63.4	100
1967	21.2	35.3	17.1	27.1	9.5	15.1	14.2	22.5	63.0	100
1968	22.8	40.1	17.6	31.0	6.9	12.1	9.5	16.8	56.8	100
1969	22.0	40.6	16.9	31.3	5.8	10.7	9.4	17.4	54.1	100
1970	24.6	38.4	18.8	29.3	*8.1	12.5	† 9.6	14.9	64.2	100
1971	20.7	39.2	17.8	33.7	*6.0	11.3	† 5.2	9.8	52.8	100
1972	20.2	37.6	19.1	35.5	*5.2	9.7	† 6.3	11.6	53.8	100

* Philippines only

† Including the USA

THE PRESENT SITUATION

The pineapple industry up to now has seen good as well as bad times. The present situation is not at all discouraging, although trade has not been as good as the boom years of 1969–1970. Various factors contribute to this, among which are competition from other countries, the US dollar and sterling devaluations, as well as trade restrictions by the buyer countries and their general economic problems. However, we have been able to maintain our position in the traditional markets—the United Kingdom, United States and Canada, which together take up 70% of our 1972 production (*Table 6*). Of the total imports of the product into these countries, the Malayan pack makes up 38%, 10% and 41% respectively.

Table 6. Exports of Malayan canned pineapple: 1972

Country	*M$ million*	*'000 ton*	*%*
United Kingdom	19.9	23.5	36
USA	9.7	14.0	21
Canada	5.8	8.0	12
European Economic Community	3.4	5.0	8
New Zealand	3.3	4.5	7
Japan	2.0	2.7	4
Middle East	2.8	4.0	6
Others	2.3	3.4	5
Total	49.2	65.1	99

The entry of the United Kingdom into the European Economic Community in January 1973 will see the Malayan pineapple being gradually priced out of its traditional market. A common external tariff of 4.8% has been imposed in 1974 on our exports to the United Kingdom. This will increase by the same amount each year until 1978 when it will be 24.4 percent. In addition, there is a sugar tax and a price stabilization levy to be encountered (Tay, 1974). The ultimate retail price of the Malayan pack once the full impact of the EEC's import restrictions is felt would be about 40% higher than in the pre-EEC days.

The European Economic Community has become the most important market for Malayan pineapple now that the United Kingdom is a member. The total intake by the enlarged EEC of our product in 1972 was around 44%, followed by the United States with 21% and Canada with 12 percent. The major suppliers to the EEC market (including the UK) and the 1971 volume in thousands of ton (given in parentheses) are South Africa (31.5), Taiwan (31.6), Ivory Coast (30.5), Malaysia (26.9), the Philippines (23.9), the United States (21.4) and Martinique (10.6). The Ivory Coast is the third largest exporter to the EEC after South Africa and Taiwan. It is significant that the Ivory Coast is an associate member of the EEC, and as such is exempted from the Common External Tariff which Malaysia is facing. Competition in the EEC will thus come from the Ivory Coast, which has been reported to increase production by about 30% annually. At this rate of production it would be possible for the Ivory Coast to supply the entire requirements of canned pineapple of the EEC within the next few years. This would not be impossible, as the Ivory Coast has the assistance of French capital and technical know-how, and the French are very advanced in pineapple culture and research, if they are not the foremost world authority today.

The next important market is the US, which in 1972 took 22% of our total exports (*Table 6*). There is great potential in this market in spite of the fact that American interests are in the Philippine and Thailand industries, as well as that of Hawaii. A stumbling block is the restriction against our cubes and spiral cuts entering the country. These cuts have proved popular in other countries and could be equally popular in the US if the present restriction is lifted. Unfortunately our representations thus far have been in vain.

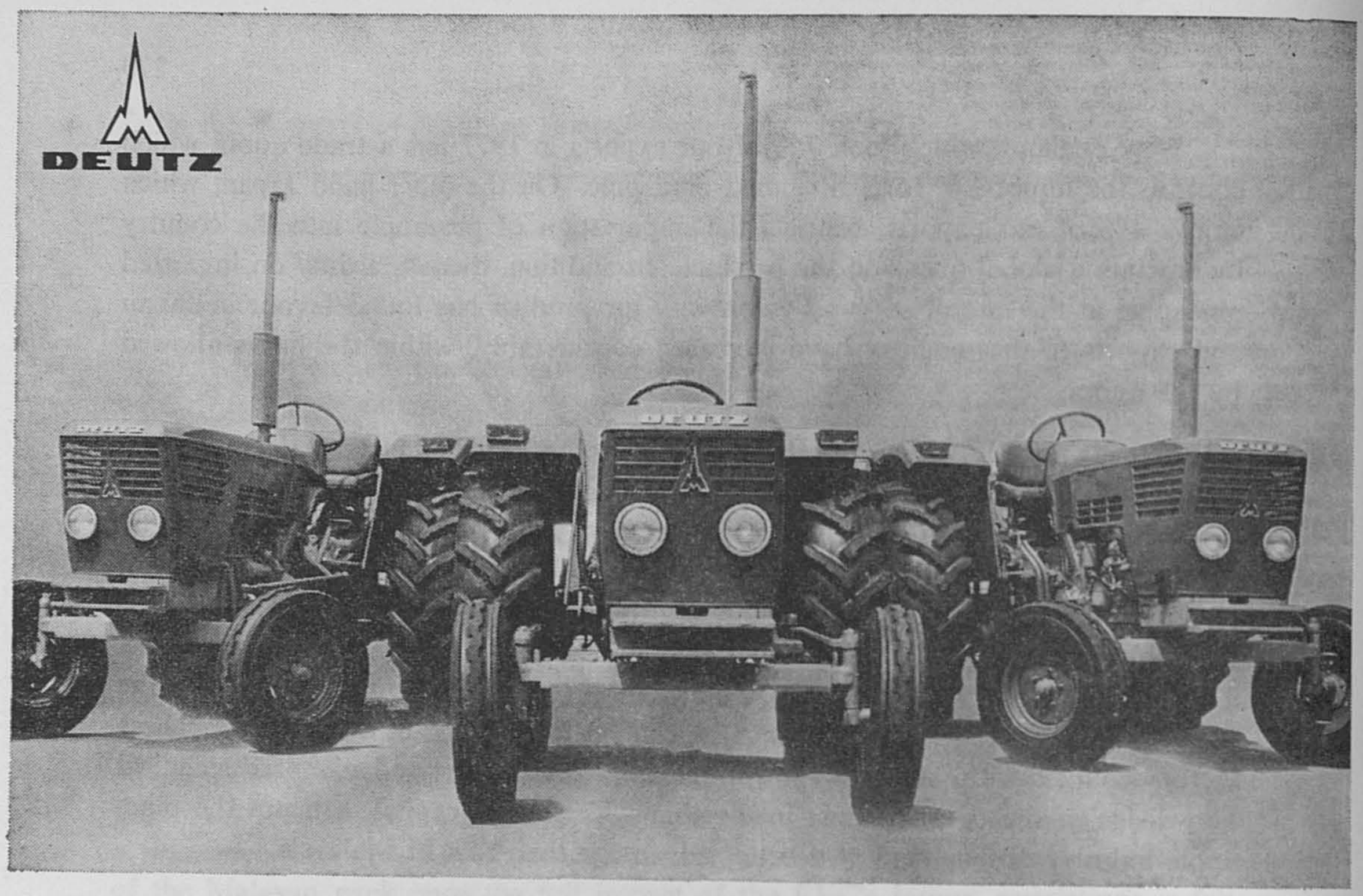
New Zealand, which took 7% of our exports in 1972 has a trade quota which controls the imports of foreign canned pineapple. On the other hand Japan, which enjoys 4% of our exports, restricts the importation of pineapple into the country by erecting a global quota on the product. In addition, there is a duty on imported pineapple at the rate of 35% *ad valorem*. Our product has found favour in Japan and exports to that country have increased considerably, within the limits allowed by the quota.

Outside the EEC's threat to the industry, another problem faced is the increasing competition from the newer pineapple-producing countries. One of the fast expanding industries is that of Thailand. Financed by foreign capital and managed by experienced personnel, it can expand to a size to be reckoned with. An important factor to be considered here is the cultivar grown. Unlike Malaysia, where Singapore Spanish and Masmerah are grown for canning, Thailand grows the Smooth Cayenne. This is highly advantageous since the fruit is two to three times the size of the Singapore Spanish. At the same time the cannery recovery is at least double. These factors, coupled with the equally low if not lower labour rates and advanced technical knowledge of the crop, brought in together with foreign capital, can put the pineapple industry of Thailand at a better advantage than that of Malaysia.

WHAT OF THE FUTURE?

From the beginning, Malaysia has been canning the smaller fruited Singapore Spanish pineapple. The fruit averages 2 lb, and has thick skin, resulting in a low cannery recovery of about 18 percent. The Smooth Cayenne of other producing countries, on the other hand, weighs two to three times as much and the cannery recovery is doubled. Malaysia has been able to compete effectively in the international market in spite of the cultivar mainly because of our low labour rates. This situation cannot last forever. What with the major producing countries moving from the high labour cost areas to the developing countries, where labour is still cheap, we are facing competition more and more on an equal footing, if not at a slight disadvantage because of our cultivar. An excellent example can be seen in the Hawaiian industry. The high cost of land, labour and operating expenses in Hawaii have been the cause of pineapple concerns moving out to the Philippines, Kenya, Thailand and possibly other Asian countries.

Why does Malaysia persist in growing and canning the Singapore Spanish in the face of the low yield and cannery recovery? The main reason is historical. Ever since the industry developed in the late nineteenth century in Singapore, this cultivar has been grown. Malayan pineapple has been sold overseas in three qualities; fancy, choice and standard. The golden-yellow pieces go to make up the fancy pack, the yellow to the choice pack and the pale yellow make up the standard. Fortunately or unfortunately, only the Singapore Spanish cultivar is capable of producing golden-yellow fruits under the Malaysian conditions of soil and climate. As we are dependent on fruit colour as a quality rating, we become more and more dependent on the Singapore Spanish cultivar.



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The question now arises as to whether we should not change the canning pineapple to Smooth Cayenne. We have been growing the Cayenne type of pineapple in the form of our Sarawak cultivar and have shown that it can be canned. The only disadvantage is the yellow to pale yellow colour of the flesh. As far as the fruit is concerned the size and quality are comparable to those of the Smooth Cayenne grown overseas. Plant selection activities to improve the Sarawak pineapple have been going on in the Pineapple Research Station since 1964 and results have been encouraging. What needs to be done further is to propagate vegetatively the promising clones to increase the plant population for clonal trials to be carried out. Also, agronomic trials on fertilizer, planting density, flower induction and pest and disease control need to be intensified. A well-planned research programme needs to be undertaken with emphasis on the Sarawak cultivar before we can embark on large-scale planting.

Parallel to the above programme should be one aimed at the consumers. We have all along believed that the buying public prefers the golden-yellow Malayan pineapple. Is this true? Tay (1974) reported that the sales of South African pineapple in the United Kingdom have increased considerably during the last few years while Malayan pineapple has seen a drop. As South Africa produces the Smooth Cayenne pineapple, can this mean that consumers prefer the Smooth Cayenne to the Singapore Spanish? Obviously a consumers' preference study is urgently required. Once this study is completed, Malaysia should seriously re-examine the question of the canning cultivar.

Alternatively we could retain the golden-yellow pineapple and improve on the size of the Singapore Spanish fruit. To this end an effort has been made in the form of the Masmerah pineapple (Wee, 1974). This was developed through selection and fruit size is comparable to that of the Smooth Cayenne. The flesh is intensely golden but as the cultivar is basically of the Spanish type the skin is thick and the cannery recovery only slightly better than that of the Singapore Spanish. The planting materials of the Masmerah pineapple are being distributed to the smallgrowers under the "Pineapple Replanting Scheme" launched in 1971, and this is a step in the right direction. However, the development of the Masmerah should be taken as a stop-gap measure. Further improvements need to be made. In this connection the plant improvement programme should not be relaxed, as the main work has yet to be initiated.

An important aspect to be studied is the reduction of field and cannery costs. This would reduce cost of production and put us on a better level of competitiveness in the international scene. Research into the improvement of agronomic and cannery practices would go a long way to achieve this.

On the quality scene, legislation is in existence to ensure the continued high standard of the canned product. The Malayan Pineapple Industry Board, which is a statutory body set up by both the Governments of Malaysia and Singapore, maintains a team of trained cannery inspectors to see to this. An inspector is stationed at each cannery to check on the quality of the daily pack as well as the maintenance of hygienic conditions. Samples are drawn from the previous day's output and examined to ensure that they conform to standard requirements.

An effective sales organisation has been evolved in the Pineapple Industry Marketing Corporation which was enacted under the Pineapple Industry (Marketing Corporation) Regulation 1966. The main object of this Corporation is to promote, manage and control the marketing of canned pineapple. All canners are required to sell their products through the Corporation, which fixes the minimum prices. This has gone a long way to eliminate price undercutting and can only result in the stability of the industry.

The future of the Malaysian canned pineapple trade is in our own hands. We can only hope that these guiding hands are highly capable and possess genuine dedication to the improvement of the industry. Research, in the authors' opinion, has a very important role to play, for on research will rest the responsibility of producing a yet better fruit and lowering cost of production, for only then can Malaysia hope to be competitive in the international trade in canned pineapple.

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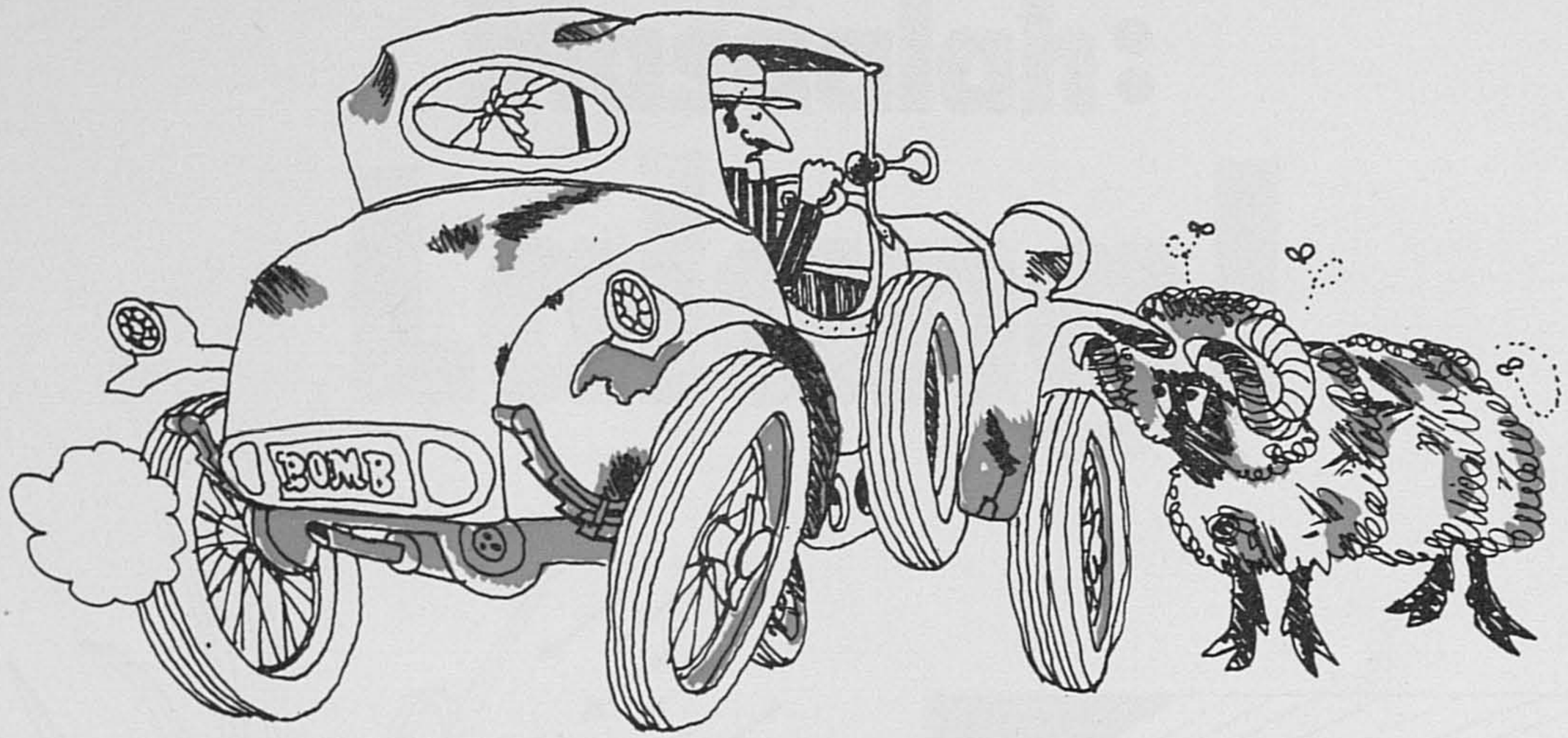

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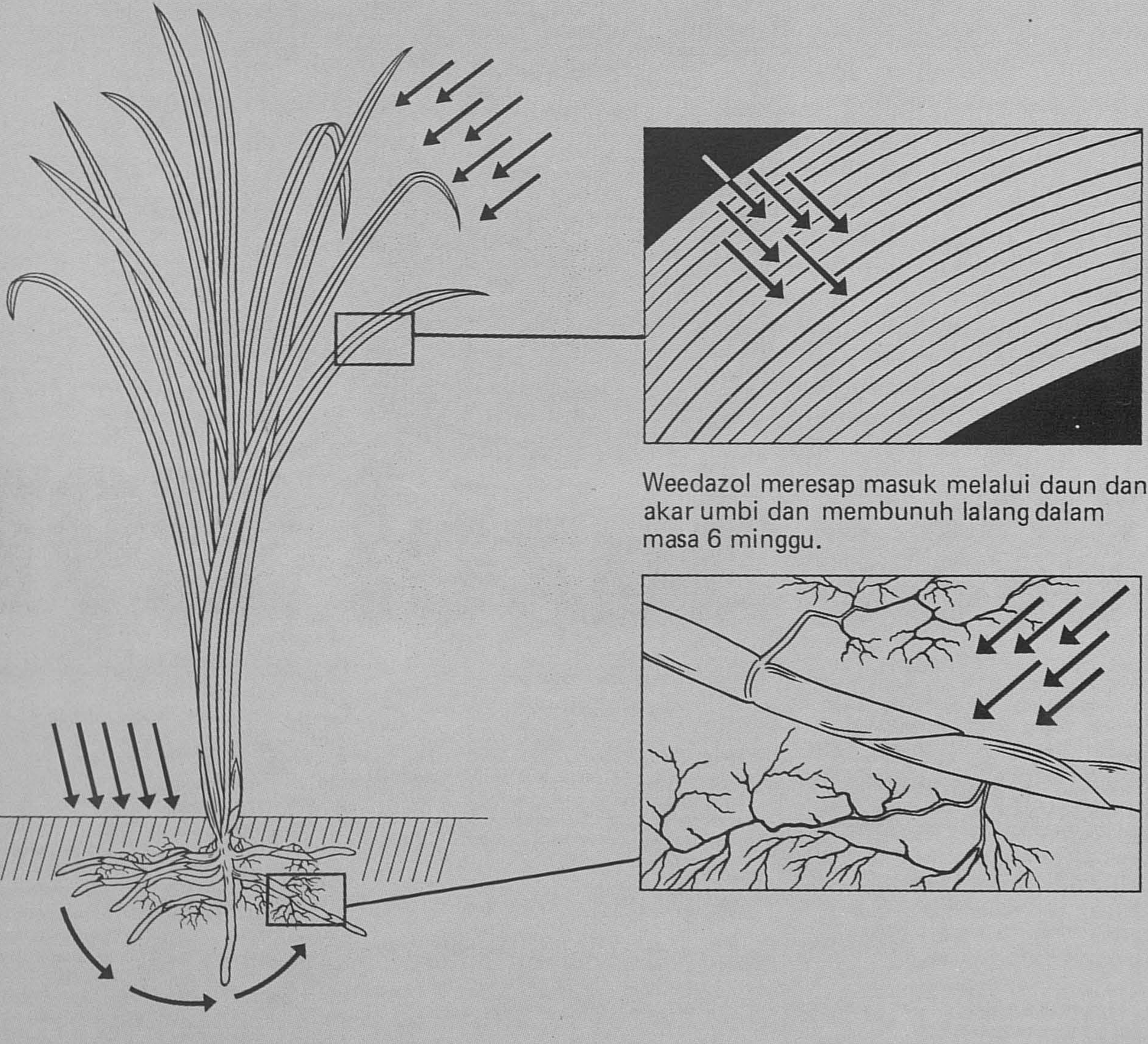

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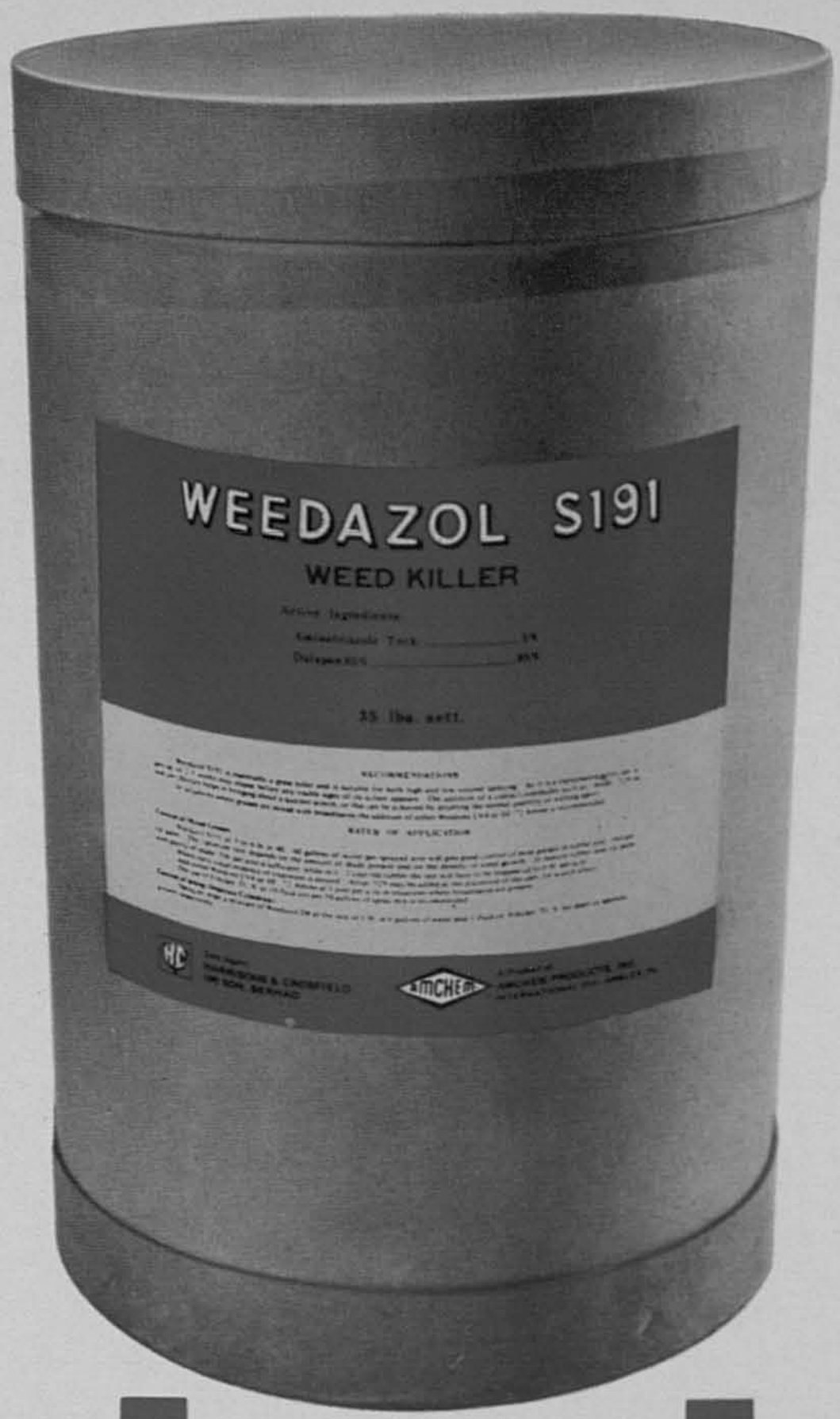

Weedazol S191

Weedazol S191 ialah jawapan kepada masaalah yang lama mengenai lalang di ladang-ladang getah dan kelapa sawit. Adunan dari dua jenis pembunuh lalang yang masyhur, Dalapon + A.T.A., Weedazol S191 adalah lebih jimat untuk digunakan olih kerana sedikit semburan sahaja yang diperlukan.

KADAR SUKATAN YANG DISYORKAN UNTUK MENGAWAL LALANG:

20 paun dicampur dengan 120 gelen air untuk semburan bagi tiap-tiap satu ekar.

MUDAH DIGUNAKAN:

Weedazol S191 segera sebati dalam air. Campurkan kedalam air dan gunakan alat penyembur yang biasa.

RACUN RUMPUT-LALANG YANG BOLIH BERUBAH (TRANSLOCATED):

Weedazol S191 ialah sejenis racun rumput lalang yang bolih berubah (Translocated). Ianya mengambil masa selama 6–8 minggu untuk membunuh sama sekali.

KEGUNAAN BERULANG-KALI:

Untuk mendapatkan hasil yang baik, semburlah dengan menggunakan cara yang berulang-kali. Gunakan WEEDAZOL S191 sebagai semburan yang pertama. Diikuti pula dalam masa 3–4 minggu kemudian-nya dengan suatu racun rumput-lalang yang lebih kuasanya.

RACUN RUMPUT-LALANG YANG TUMBUH SEMULA:

WEEDAZOL S191 bolih juga digunakan sebagai RACUN RUMPUT-LALANG YANG TUMBUH SEMULA (POST EMERGENCE HERBICIDE).

ARAHAN UNTUK MENGGUNAKANNYA:

KAWALAN LALANG:

SEMBUR atau MENGESAT. Untuk menyembur lalang, campurkan sebanyak 20 paun WEEDAZOL S191 6 fl. ounce surfactant didalam 120 gelen air. Untuk mengesat pula, campurkan 1 paun WEEDAZOL S191 didalam 6 gelen air. Atau ½ paun dalam 3 gelen air.

KAWALAN RUMPUT-RUMPAI:

Olih kerana pembunuh rumput ini kuat kuasanya, WEEDAZOL S191 adalah sesuai untuk SEMBURAN YANG BANYAK dan SEMBURAN YANG SEDIKIT. Selepas 2–3 minggu baru nampak kesannya. Untuk kawalan rumput-rumput diladang-ladang getah dan kelapa sawit yang dewasa, gunakan sebanyak 3–6 paun WEEDAZOL S191 dicampur dalam 40–50 gelen air adalah cukup untuk menyembur seluas satu ekar. Kadar 3 paun seekar WEEDAZOL S191 adalah mencukupi bagi kawasan yang di-bawah naungan. Pokok-pokok getah yang umurnya diantara 1–2 tahun, kadar sukatannya hendaklah ditambah sehingga 60 paun bagi satu ekar.

Pembahagi tunggal:

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Cassava as animal feed

D. G. Coursey and D. Halliday*

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Although more than 90% of the world's cassava production is used for human food, interest in this crop as an energy source for inclusion in pig and poultry feeds was greatly stimulated by the artificial price situation in EEC countries created by implementation of the Common Agricultural Policy. Relative European and world market prices for both protein and energy sources have since changed radically. In this article the present position and future prospects are reviewed.

The cassava plant, which is now extremely widespread throughout the tropical world, is known by many names. In English-speaking Africa, the Caribbean and some other areas it is generally known as cassava, but the alternative term manioc is also sometimes used, particularly in American English: in Asia and the Pacific, however, it is more commonly known as tapioca, the name being applied to the plant, as well as to the well-known grocery product: in French it is almost universally *manioc;* in German, *Maniok;* in Brazilian Portuguese it is usually termed *mandioca* or occasionally *aipi;* while in the Spanish of Latin America it is *yuca,* a term which must not be confused with the name of the sisal-like plant, *Yucca.* Botanically the plant is correctly described as *Manihot esculenta* Crantz, although it is still quite often referred to by agronomists by the invalid name of *Manihot utilissima* Pohl, and in some of the older writings various other taxa such as *Manihot aipi, Manihot dulcis* and *Manihot palmata* are used to distinguish various cultivated forms that should correctly all be included within the taxon *Manihot esculenta.* The genus *Manihot* belongs to the Euphorbiaceae, which also includes the rubber tree (*Hevea*) and cator seed (*Ricinus*), as well as *Euphorbia* itself. Plants of the genus *Manihot* occur naturally only in tropical America, where about 100 different species are known (Rogers & Fleming, 1973). None of the other species are now of any economic value, although *Manihot glaziovii* Muell-Arg was at one time exploited as a latex-producing plant under the name of Ceara rubber.

The plant is a short-lived shrub, usually growing between 1 and 3 metres in height but sometimes attaining the stature of a small tree. There is a great deal of variation in habit amongst the different cultivars, some forms having only a single stem while others are more or less heavily branched. The leaves are palmate with anything from 3 to 9 lobes, and the rather inconspicuous white flowers are borne in racemes near the ends of the branches. If they are allowed to grow to maturity the flowers are followed by dry capsules containing 3 seeds each, although, in cultivation, the plants are usually harvested before flowers form.

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* both Tropical Products Institute, London.

The economically important part of the plant is the tuber. Tubers develop by a process of secondary thickening in a proportion of the roots and, although here again there is much variation according to variety, age and condition of growth, typically from 3 up to as many as 10 of the swollen root tubers develop per plant, each being anything from 150 mm to a metre in length and up to 150 mm in diameter, or occasionally even larger, of a tapering or cylindrical form. In cultivation, the plant is almost invariably propagated by means of stakes or hardwood cuttings cut from the older wood, anything up to 300 mm in length, or occasionally even longer. These may be planted either vertically, inclined at an angle or even laid horizontally just under the soil surface. Sprouting takes place rapidly, provided that water supplies are adequate, and tuberization of some of the roots usually commences after about 4 months. In contrast to grain crops, in which the grain is ready for harvesting at a particular time, there is in the case of cassava no very definite harvest time, although there is much varietal difference in the rate of development of the tubers. If, however, the roots are not harvested as soon as they are ready, they can be left in the ground and indeed enlarge somewhat for several months after, although in doing so, they may become somewhat lignified and so less useful as food or feeding-stuff. Some of the most precocious varieties give a useful yield after as little as 7 or 8 months, whereas others need as much as 18 months to produce a worthwhile crop: most varieties are intermediate in their growth rate, requiring 12 to 15 months for maturity. The seed is never used as a normal means of reproduction but, if the plant is allowed to mature, seeding occurs fairly readily and some experimental hybridization has been done with the crop in attempts to produce improved varieties.

PRODUCTION AND UTILIZATION

Like other *Manihot* species, cassava is of tropical American origin and was used as a food plant by the native Amerindians probably more than 4,000 years ago and certainly long before Columbus' discovery of the New World. Its use as a food was rapidly adopted by the earliest Spanish and Portuguese voyagers and the plant was taken to Africa by them as early as the 16th century. Later, by the 18th century, it was in cultivation in some of the countries surrounding the Indian Ocean (Jones, 1959). Its spread in Africa was initially comparatively slow but has accelerated greatly during the present century, with the result that cassava is now almost as wide-spread in Africa as in its native South America, while it is also cultivated very widely in south-east Asia and even Oceania. Today cassava is grown almost throughout the tropical world, being produced in more than 80 countries.

In terms of production, cassava is now the eighth most important food crop in the world, being surpassed only by wheat, rice, potatoes, maize, barley, millets and sorghums, and sugar. It has been estimated that world production in 1972 was around 105 million tonnes of fresh roots from a cultivated area of some 11 million hectares (*Table 1*). Cultivation is concentrated mainly in Africa, South America and Asia (mainly south-east). Brazil is by far the largest national producer followed by Indonesia, Zaire, Nigeria, Tanzania and India. It should be noted however that, as this crop is mostly produced by subsistence farmers, statistics for production are very unreliable and the figures given should be regarded as only very rough estimates.

Table 1. World area and production of cassava in 1972

	Area thousand hectares	*Production thousand tonnes fresh roots*
Africa	*5.996*	*46,220*
Zaire	810	10,500
Nigeria	960	9,570
Tanzania	800	6,000
South America	*2,549*	*36,168*
Brazil	2,100	31,000
Paraguay	125	1,850
Colombia	160	1,600
Asia	*2,331*	*22,188*
Indonesia	1,350	10,099
India	355	5,939
Thailand	225	3,867
Central America and Caribbean	*110*	*713*
Oceania	*11*	*128*
Total world production	*10,998*	*105,417*

Source: FAO Production Yearbook 1972

The spread of cassava through the tropical world in recent decades has been almost exclusively in connection with its use as a human food crop grown mainly by subsistence farmers, whether in South America, in Africa, in south-east Asia, or in Oceania. Although in some African countries during the colonial era the planting of cassava as a famine reserve was actively encouraged by the authorities, most of this spread of the use of cassava has been purely spontaneous; or, as expressed by Rogers & Appan (1971), "it did it on its own". Apart from its poor nutritional value, cassava is, for the subsistence farmer, a near perfect food crop and it has now become the staple food of more than 200 million people across the tropical world. The advantages of cassava to the subsistence agriculturalist derive not only from its capacity for extremely high yields under good conditions, where it can probably produce more calories of food per hectare than any other food crop; its extreme adaptability to varied and particularly to poor conditions, including a capacity to produce at least some yield on virtually exhausted soils; and its resistance to pests and diseases, which may reduce yield but hardly ever destroy a crop catastrophically; but also, perhaps most important of all to the subsistence farmer, from the fact that it yields more food energy per unit input of manual labour than any other known crop. This last factor has simultaneously made cassava extremely attractive to the farmer who uses manual cultivation techniques, but has tended to inhibit the development of a mechanized approach to its agronomy which in turn has inhibited the introduction of cassava into modern mechanized agriculture. Use as human food thus accounts for more than 90% of the cassava that is produced in the world, and uses as animal feed and industrial uses, such as starch manufacture (the starch being used mainly in the textile and adhesives industries) or the preparation of other industrial products, are comparatively minor when viewed in global terms.

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NUTRITIVE VALUE AND TOXICITY

Fresh peeled cassava roots normally contain 60–70% water, the dry matter being mainly starch, only very small percentages of fat and protein being present (*Table 2*). Cassava is, therefore, included in animal rations only as a source of carbohydrate-derived energy. The crude protein content is only one third to one quarter of that of cereals used for animal feeding.

Table 2. Proximate composition of peeled cassava roots and cereal grains

Commodity	*Average composition of dry matter (%)*				
	Nitrogen-free extract	*Crude protein (N × 6·25)*	*Oil (Ether extract)*	*Crude fibre*	*Mineral matter (ash)*
Dried peeled cassava roots	89·1	3·0	0·5	5·3	2·1
Barley	79·2	10·6	1·8	5·3	3·1
Maize	79·5	11·4	5·1	2·5	1·5
Wheat	79·6	14·0	2·2	2·2	2·0
Sorghum	80·0	12·1	3·1	2·6	2·2

The composition of cassava chips or pellets traded internationally for use in animal feeding is by no means constant: in general, the higher the crude fibre and ash contents the lower the quality. Excessively high moisture contents may result in damage due to moulding and will in any case reduce the dry matter content of the material. In general, cassava chips or pellets exported to EEC countries are expected to conform to the following specifications for quality (UNCTAD/GATT, 1968): starch, minimum 70%; crude fibre, maximum 5–6%; ash, maximum 3–5%; moisture, maximum 13–14%.

On account of its low protein content, any substitution of dried cassava for cereals in mixed feeds must be compensated by an increased inclusion of protein concentrates such as oil-cakes or meals. In general, it has proved most attractive in economic terms to include cassava in rations for monogastric animals which do not require very high protein contents, *e.g.* those for the final stages of pig fattening and for reproductive sows. It is also used, however, as an ingredient of feeds for poultry, cattle and less mature pigs.

In addition to low protein content, the use of cassava in both human food and animal feed is constrained by the presence of cyanogenetic glycosides, which are readily split by enzymes naturally present in cassava roots to form free hydrogen cyanide (Coursey, 1973). The principal cyanogenetic glycoside found in cassava is linamarin, which is structurally 2-(β-D-glucopyranosyloxy) isobutyronitrile, and which liberates acetone and glucose as well as hydrogen cyanide when hydrolysed by acid or enzymes. A closely related compound, lotaustralin, which liberates hydrogen cyanide, methyl ethyl ketone and glucose, is also present in cassava in much smaller quantity than linamarin (2–8% of the total cyanogenetic glycosides present).

Hydrogen cyanide is of course a very toxic substance and, if present in sufficient quantity in a ration, will cause acute poisoning resulting in death. The ingestion of sublethal quantities by animals may have chronic effects which may have an adverse effect on production. It has been shown that the presence of sublethal quantities of hydrogen cyanide in both animal and human diets may have both a goitrogenic and a neuropathological effect. The goitrogenic effect which causes enlargement of the thyroid is more commonly observed, and results from the formation of thiocyanates when the ingested cyanide is detoxified by the body. Another consequence of the detoxification of cyanide within the body is the depletion of the essential sulphur-containing amino-acids methionine and cystine. These amino-acids are often limiting in vegetable proteins and loss in this way may have a serious effect on production. In fact, cassava protein is particularly deficient in sulphur-amino acids; but, in view of the very low protein content of cassava, it is the effect on other protein sources in mixed rations containing cassava which is of greater practical significance. It has been shown that the addition of synthetic methionine to rations containing cassava has a very beneficial effect in both improving the efficiency of cyanide detoxification and sparing loss in protein sulphur amino-acids (Maner & Gomez, 1973). Supplementation of cassava-containing mixed rations with iodine, in addition to methionine, largely eliminates goitrogenic activity due to thiocyanate production.

The concentration of cyanogenetic glycosides in cassava roots varies widely and is dependent on variety, climate and cultural conditions. The normal range is equivalent to 15–400 mg HCN per kg fresh roots (occasionally as low as 10 or as high as 2,000 mg per kg) but most samples are within the range 30–150 mg per kg. Normally the peel fraction has a concentration of cyanogenetic glycosides some 5 to 10 times greater than the flesh (Coursey, 1973) and good peeling greatly assists in reducing cyanide levels in dried roots used as ingredients of mixed feeds. Cassava roots also contain the enzyme linamarase which comes into contact with the cyanogenetic glycosides, when the tissues deteriorate or are mechanically damaged after harvesting, and hydrolyses them, thus liberating free hydrogen cyanide. The toxicity of cassava appears to be primarily associated with the ingestion of free hydrogen cyanide rather than of the unhydrolysed glycosides, and there is evidence to suggest that provided the linamarase has been inactivated, *e.g.* by heating, there is little danger of toxicity from this latter source. However, it should be mentioned that other vegetable materials may contain enzymes capable of liberating hydrogen cyanide from the cyanogenetic glycosides of cassava, particularly if they are fed fresh.

The effects of this toxicity in practical terms as far as the feed industry is concerned, are restrictions in inclusion rates of cassava in mixed feeds so as to avoid possible loss in animal production. A number of experiments have been reported in which it has been shown that high rates of inclusion of cassava meal in pig and poultry rations result in reduced growth rates, and practical recommendations for the use of cassava products in mixed feeds have been based on these. Maximum inclusion rates allowed in the Federal Republic of Germany, the largest user of cassava meal for animal feed, vary with the particular type of feed, being 10–40% for pigs, 20–25% for cattle and 10–20% for poultry. In practice, however, inclusion rates are much lower than this, being in the range of 6–20% for pigs and 3–6% for poultry, with very little at all being used for cattle rations. It has been reported that

co-operatives in the Netherlands are recommended to restrict maximum inclusion rates of cassava to 7·5% in poultry feeds, 15% in pig feeds, and 20% in cattle feeds, while in Belgium not more than 5% of cassava meal is normally included in mixed feeds (UNCTAD/GATT, 1968).

It should be mentioned that recent experiments which have been carried out on the feeding of fresh cassava to pigs have indicated that much higher inclusion rates than those indicated above can be used with very successful results when the ration is supplemented with synthetic methionine. Clearly much more work is required in this area to establish practical maximum inclusion rates for methionine-supplemented cassava meal in mixed feeds for cattle and poultry, as well as for pigs (Maner, 1972).

In addition to whole or peeled cassava roots, the residues remaining after factory-extraction of starch from cassava roots are also used as animal feed. This material has been reported to have a proximate composition, expressed on a dry basis, of 88·3% nitrogen-free extract (mainly residual starch), 1·9% crude protein, 8·3% crude fibre and 1·9% ash. Its nutritive value is, therefore, rather below that of dry whole cassava roots, in that it is rather poorer in protein and higher in crude fibre content (Mahendranathan, 1971).

USE AS ANIMAL FEED

Cassava was very little used as an animal feed in the developed countries until fairly recently. However, the implementation of the common agricultural policy (CAP) by the European Economic Community (EEC) in the early 1960s created a highly artificial situation in which cereals traditionally used as the main source of energy in mixed feeds were supported at prices, within the EEC, which were well in excess of world market prices for cereals at that time. This was coupled with a liberal policy with regard to the importation of protein concentrates at world market prices, reducing the normal differential between the cost of energy and protein ingredients of mixed feeds. At the same time import levies on dried cassava roots were fixed at levels substantially below those for feed grains. For example, the import levy on dried roots in 1967 was only around 25% of that on barley, and in any case could not exceed 6% *ad valorem* (UNCTAD/GATT, 1968). Since January 1972, cassava chips and pellets imported into the EEC have been subject only to a 3% *ad valorem* duty (Phillips, 1974).

The high cereal prices within the EEC made it economic to use other materials as sources of energy in mixed feeds, and this stimulated a demand for alternatives which was partially met by a massive increase in cassava imports, especially by those member countries—West Germany, the Netherlands and Belgium—which were traditionally importers of cereals (*Table 3*). Imports into France are limited by the large availability of home produced cereals, while the economic advantages of using cassava in Italy have been reduced by a special arrangement within the CAP allowing the importation of maize without imposition of the full import levy.

Table 3. Imports of cassava products into the European Economic Community, 1962–70 ('000 tonnes)

Year	*West Germany*	*France*	*Italy*	*Netherlands*	*Belgium*	*Total*
1962	366	23	0	1	23	413
1963	387	20	0	5	72	484
1964	462	18	0	17	105	602
1965	520	17	1	76	100	714
1966	702	16	0	96	70	884
1967	533	na	na	159	113	(805)
1968	481	na	na	237	127	(845)
1969	548	na	na	444	212	(1,204)
1970	591	na	na	502	268	1,410

Brackets indicate partial totals
na = not available
Source: Phillips (1974)

Dried cassava chips and pellets are low in protein compared with cereals, and substitution of cereals by cassava in mixed feeds inevitably increases the proportion of protein concentrates, such as soya meal, which must be included. If differences between prices of cereals and protein concentrates are small—as within the EEC during the first decade of the CAP—then the additional cost of making up this protein deficit is small enough not to detract to too great an extent from the economic advantage of the lower cost of cassava than of cereals as an energy source. Outside the EEC, however, protein was very much more expensive than energy during the period in question. For example, soya meal containing 50% protein was normally about twice the price of feed barley. The lower cost of cereals and the higher cost of protein in relation to energy have made it uneconomic to use cassava as an animal feed ingredient in developed countries outside the EEC. It should, therefore, be emphasized that the incentive to use cassava in this way has been due to purely artificial forces and is not related to overall market supply and demand for animal feed materials.

In general, cassava is comparatively little used as animal feed within the producing countries themselves. This is because it is largely grown as a food crop and also because animal production in these countries is usually only poorly developed. Brazil is reported to be a notable exception, in that very large quantities of fresh cassava and residues from starch production are used as animal feed. Estimates of the proportion of total Brazilian cassava production consumed by animals vary but one estimate suggests that this may have accounted for 47% of average annual production during the period 1964–66 (Phillips, 1974). There is now considerable interest in using cassava for animal feed to a greater extent in other Latin American countries such as Colombia, and in south-east Asian countries such as Malaysia. Much research experience is being accumulated by several organizations in these regions, particularly with regard to the use of fresh cassava as a major ingredient of pig rations (Maner, 1972). Dried cassava is very little used at present due to the poor development of animal feed compounding industries.

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FUTURE PROSPECTS

Market analysts have predicted a continuing increase in imports of cassava chips and pellets into the expanded EEC. For example, it was estimated in a recent detailed study (Phillips, 1974) that, by 1980, demand for dried cassava within the EEC would lie between a minimum of 3·4 and a maximum of 8·9 million tons (which corresponds to 8·7 to 22·4 million tons of fresh roots). This study assumed that relative prices of feed materials prevailing in 1971/72 would remain constant throughout the decade, and also that the adaptation of the new EEC members (the United Kingdom, Denmark and the Republic of Ireland) to the CAP would create additional demand for cassava. However, the position with regard to feed prices changed dramatically during 1972/73 and EEC prices for cereals are no longer greatly in excess of world feed grain prices. Also, the price of protein for animal feed is now about double what it was when the above projections were made, and at the time of writing the cost of both protein and energy are in line with world market prices. In the light of these changes these projections must now require revision; with the continuing uncertainty regarding future trends in world feed prices and the possibility of some changes in the CAP, the future demand for cassava at current price levels within the expanded EEC must also be uncertain.

Possibilities for increasing usage of dried cassava in developed countries outside the EEC are mainly centred on Japan, which is now a large importer of feed materials, importing around 80% of its requirements. Japan is much closer to the major cassava exporting countries of Thailand and Indonesia than is Europe, and freight costs are correspondingly lower. However, the economics of exporting to Japan will depend very much on the world market prices for feed grains and soya produced in the USA, which currently supplies most of Japan's requirements for animal feed, and also on the easing of current restrictions of cassava imports into Japan which are designed to protect local starch production based on potatoes.

Obviously, the price at which cassava chips and pellets can be offered for export is of great importance in determining future prospects. The c.i.f. cost of cassava chips and pellets is made up of (i) the cost of purchasing or producing fresh roots, (ii) the cost of processing into chips or pellets and (iii) the cost of transportation of the finished product overseas. In most countries where cassava is produced, it is consumed as a staple and the price of fresh roots is determined by the local demand for food. This makes the price of cassava on the local market extremely variable, and enterprises producing chips or pellets for export could not be assured of steady prices or supplies of raw material unless it were produced on plantations controlled by themselves. Most of the exports of cassava chips and pellets originate from Thailand where cassava is not used as a food. As there is no competition from the local food, market processors and exporters are able to keep prices for farm-dried chips at between US$11 and $12 per ton of fresh root equivalent, *i.e.* about US$25–27 per ton of dried chips (Nestel, 1973). These prices are, in general, very much lower than those of cassava roots in countries where they are used as food. As export prices for cassava pellets were reported to have ranged between US$60 and $72 per tonne *f.o.b.* (Phillips, 1974), it will be seen that a large margin exists for processing, internal costs and profit. These factors, coupled with active encouragement

and investment by West German business interests and particularly favourable shipping costs, have resulted in the establishment of more than 90 pelleting plants in Thailand operating a total of 300 machines, and a build-up in exports of cassava pellets to 1·2 million tonnes per annum in less than a decade.

It is considered that the production potential of cassava root in Thailand is only sufficient to sustain exports of around 2 million tonnes of pellets by 1980, so any major expansion in usage of dried cassava for animal feed in developed countries would necessitate the development of exports from other countries. The greatest potential for increased exports is thought to lie in Brazil, where a substantial surplus of roots over that required for human food already exists. It is reported that Japanese interests are already engaged in exploring the possibilities of producing pellets for export to Japan. Possibilities for export from other countries are constrained by the demand for cassava as a food and the consequent effect that this has on prices of fresh roots. In this connection it has been estimated that to produce cassava pellets at an end-user price of US$90–95 per tonne, the price prevailing within the EEC during late 1973, it is necessary for exporting countries to produce and process cassava at costs within the range of US$16–22 per tonne of fresh roots (Phillips, 1974).

Perhaps the greatest potential for cassava as an animal feed is within the developing countries themselves. Provided that a substantial surplus of cassava production over local food requirements can be maintained, there are good prospects for achieving a wider usage of fresh cassava for pig and cattle production, while dried cassava could be an ingredient of compound feeds produced to serve expanding animal production industries. The keys to achieving a wider usage of cassava in producing countries are those of research and development to overcome the difficulties entailed in using cassava as animal feed and a massive programme to increase cassava supplies. Up to now little research has been carried out on cassava and there is great potential both in increasing yields per hectare and in developing new varieties with lower contents of cyanogenetic glycosides and perhaps even higher nutritive value. It is to be hoped that the current efforts of two international research centres interested in cassava improvement (CIAT in Colombia and IITA in Nigeria) will in due course help to remedy this situation.

Another serious constraint to increasing cassava supplies is the difficulty of storing fresh roots for more than a few days without deterioration (Ingram & Humphries, 1972). This is no problem to the subsistence farmer who normally leaves the standing crop in the ground until it is required for processing into food and lifts only enough to make a few days supply of food at any one time, but would obviously be highly inconvenient in a large-scale plantation-type agricultural operation. Furthermore, it has been estimated that this practice results in about 0·75 million hectares of land being tied up unnecessarily under the standing crop. This extremely short storage life has been a major inhibition in the development of the cassava crop, particularly in the context of industrial processing. The process of deterioration is still not fully understood but appears to involve a complex of both physiological and pathological factors. Recent studies (Booth, 1973) have shown that it is in fact possible to "cure" cassava roots by storing them in a structure resembling a potato

clamp, and under these circumstances they may be kept in good condition for some months. The adoption of these procedures could well lead to a substantial increase in supplies of cassava available for animal feed.

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The monthly crop

Oil from trees is a fascinating prospect, and the idea has been promoted by Professor Melvin Calvin who has a Nobel prize for work on photosynthesis to his credit. According to the August issue of European Rubber Journal (ERJ) the professor has lately been taking a look at rubber science and cultivation in Malaysia.

ERJ's editor says that Prof. Calvin has credited Malaysia with having amassed "an immense body of knowledge" about the rubber tree, and opined that this could form the base of further studies of other hydrocarbon-producing plants. The rubber tree, according to the professor, "is one of the most efficient systems for capturing the energy of the sun and making hydrocarbon."

'Now he is not advocating that we use *Hevea brasiliensis* as a source of fuel hydrocarbons, but he did urge that local scientists undertake investigations into jungle plants about which little is yet known. Trees have the advantage of being source regenerative and probably the only efficient solar energy converters in the world, and while a petrochemical industry based on silviculture is probably a long way off, the basic idea could hold great promise'.

'As a counter to this' continues ERJ's editor 'other recent publications have opined that the pattern of the world's weather is undergoing a gross natural change, which could upset all the apple carts currently being wheeled about. ERJ is looking into this from the point of view of rubber cultivation and, while it is too early to make any definitive statements, there could be a lot more in this subject than initially meets the eye'.

After his election victory Dr Lim Chong Eu, Chief Minister of Penang, is quoted by *The Straits Times* (August 26) as saying: "They (*the opposition*) should not take their defeat as a blow. They are young men in political life. They should tamper their public utterances with more care."

Our mention of the International Society for the Protection of Animals (*The Planter*, July 1974, page 220) and that organisation's anxiety about the threat to wild life posed by the Temenggor hydro-electric scheme in Upper Perak has prompted a letter from Dr Paul Wycherley FISP, in West Australia. He writes: "When the artificial Lake Argyle was created in North Western Australia by damming the Ord River, an Operation Noah was mounted by all available government agencies, in particular the Department of Fisheries and Fauna, to rescue isolated and stranded wildlife. Where is Malaysia's Game Department? And her naturalists?".

In the same letter Dr Wycherley tells us that we have exaggerated a bit about the rainfall at Kuala Pilah, (*see* Gourd News, page 217 of the same issue). Quoting his own RRIM Planting Manual No. 12, page 52 "it is below 75 in. (190 mm) not 60 in. (150 mm)."

A famous synthetic rubber company Polysar, who are doing very nicely with their bromobutyl rubber, have gone into the alcoholic beverage business. Called simply the "bromo cocktail" it is coloured blue and is, from all reports, eminently drinkable. Following its dispensation in the company's hospitality suite at a Toronto conference it was christened Autumn Leaves. You drink it, change colour, and fall.

Since the ISP went into the conference business* we are naturally interested in how others go about organising theirs, and your correspondent frequently takes a peek at the goings-on at Kuala Lumpur conferences through the friendly co-operation of local hotel managers. One facility enjoyed by delegates to the recent *Financial Times* conference was the presence of delectable young ladies who, as soon as signalled, would bring a microphone to your table. ISP please copy.

Not so pleasant an atmosphere seems to have attended the Fourth European Conference on Plastics and Rubbers held in June in Paris at Europe's newest and most lavishly equipped conference centre, the Centre International Paris. According to a personal account by the editor of European Rubber Journal the Centre has a "multitude of facilities for slide projection, other visual aids, simultaneous translation *etc.* These notwithstanding, someone slipped up. Microphones consistently failed to work; if you were using headphones for translation purposes, no session went by without an impassioned plea from the translator for the speaker to slow down or use a mike that worked. Slides appeared on their sides, upside down or back to front. With a minority of exceptions, session chairman let their speakers over-run their allotted time *in extremis*, with the result that you could not make proper interchange between the simultaneous sessions and guarantee that your timing was right. Adequate summaries of all papers were provided it is agreed, but anyone who wanted copies in full of any of the papers read had to order them specially for delivery later at a price of Fr30 each."

The registration fee for this conference was Fr450 and to this of course had to be added the cost of getting to Paris. ERJ applies an index to conferences it attends and this is expressed as $\frac{I}{L}$ where I = information and L = cost in £. On this basis the Paris conference seems to have rated a very low figure.

Interesting to learn from *The Malay Mail* (September 17) that Encik T R Duraisingham has again been elected President of the Association of West Malaysian Planting Executives. And intriguing to note that the Association's new Vice-President is Encik Chua Hood Chuan, who was ISP Chairman in 1971 and 1972. In many respects the aims and objects of the AWMPE run parallel to those of this Society. Alas though, they are unlikely to converge. The AWMPE is a trade union.

We called recently at a Government ministry in Kuala Lumpur and were politely informed that the department we wanted had moved to another address. A plan of how to get there was obligingly provided. Using a couple of well-known thoroughfares as co-ordinates we finally tracked down the office we wanted, but only after

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* Not that we make anything out of them

a lot of leg-work and questioning passers-by. "Your plan" we complained "shows a petrol-filling station right next door, but there isn't one". A kindly official took us to his office window and pointed to an open space on a corner. "See there?" he said, "that's where it's going to be."

There's an awful lot of carelessness creeping into advertisements these days, some of it in the most prestigious publications. *TIME* magazine recently showed a full page advert, for a world-famous brand of Japanese camera which was described in the main legend as the "Sumit of perfection". And in *The Times* of London there was a full-page colour announcement of the new Mercedes 450SL which claimed, among other things: "How relaxed you are after parking all $14\frac{1}{2}$ feet in a space resembling the size of a sixpence", which on all counts must be rated as one of the worst sentences ever contrived.

Nearer 'home' we have our own dailies and while some errors in proof-reading English are perhaps more forgiveable, ambiguities which only make the advertiser look ridiculous are not. A recent advertisement in *New Straits Times* for a newly introduced brand of film copying sheets, claimed in coloured letters an inch high, that their product would HELP YOU TO MAKE A CHEAP IMPRESSION. And there was a swank brand of male cosmetics made in Germany which we are told is "the singular brand used by German men."

This magazine is by no means perfect in this regard, but there is little we can do if our advertisers have blocks made or inserts printed without showing them to us first.

Last laugh for a Melbourne moggie. The *Sydney Sunday Telegraph* tells of a Melbourne housewife who bought a cardigan from Myers, the big stores, only to find later that it didn't fit. On her way back to change it the next day she ran over a cat, and this distressed her very much as she loved animals. Rather than leave the cat's remains on the road she took the cardigan out of her Myers plastic carrier bag and put the cat in it, planning to bury it later. In the Myers car park she put the bag on the car roof while juggling other packages. She forgot it and headed for the cardigan counter, then remembered, and turned back to see another woman making off with the bag.

The thief was found stretched out later on a coffee-shop floor.

Correction to one of the references given in Dr Teo's paper last month: page 236, MOREL, G.M. (1968) should read (1965).

On a burning issue of the day—we can't remember which one—Australia's Prime Minister was recently quoted by Radio Malaysia as saying: 'I will not stand supinely by".

Nice one Gough, but you couldn't if you tried. Supine means flat on your back.

GET INTO SOMETHING DIFFERENT

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Completely new. Different from all other cars on the roads today. New Tri-Stable suspension. New steering. And one of the world's most revolutionary safety systems—a reinforced steel passenger compartment and impact controlled front and rear zones. New enduring European design, a whole host of luxury features and a four cylinder, anti-pollution engine effortlessly capable of a maximum speed of 100 miles per hour. A car that gives you the smoothest, safest, effortless ride ever, under all road and traffic conditions. Because it is a completely new Opel. Something different. Get into one today for a test drive.

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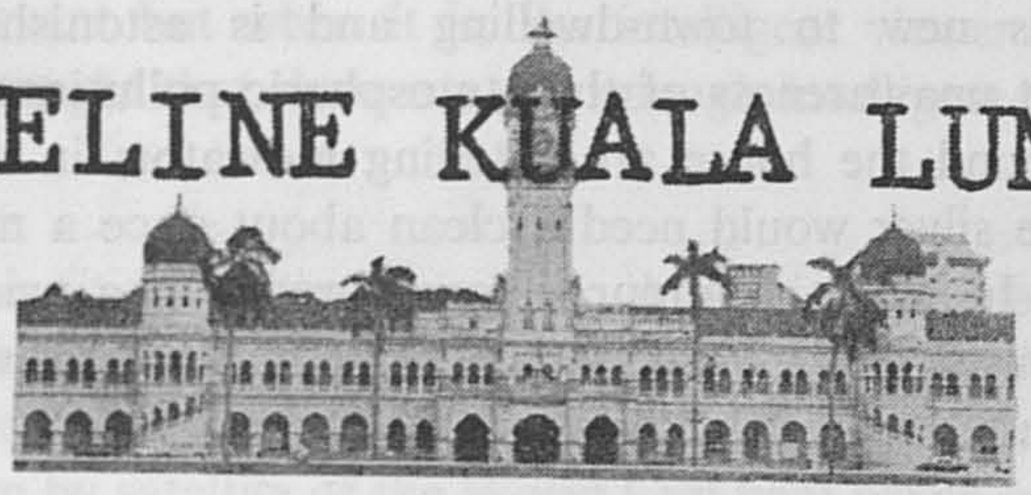

ELECTIONS AND IMPERFECTIONS

The only traces of emotion produced by our recent general election did not arise from the usual sources. The chief demerit was that about ten per cent of eligible voters were not on any register. A number of the disfranchised had received an invitation to inspect the local register as long as three years ago, but had neglected to do so. Others had moved away from districts in which they were registered and had taken no action about transferring their names. This is a matter largely in the hands of the individual and no government agency or electoral commission can be expected to possess psychic powers.

There were of course many citizens disfranchised through no fault of their own and these unfortunates may be thought deserving of some consolation. If our democratic government respects the watchword of the American revolution 'Taxation without representation is tyranny', and does not wish to be considered tyrannical, perhaps a tax holiday might be granted, by way of poetic justice, until the next general election.

The only other important matter, and one which gave rise to more widespread discontent, was the plastering of public property with election posters. Notwithstanding an all-party pre-election compact not to do this, and also to remove all posters after the election, the agreement was honoured more in the breach than the observance. In addition, some of the removal operations were anything but clean, and much paper litter was left lying about.

Now the weather and our weeks-long dry spell. Why is it that such droughts, anywhere in the world, become the occasion for a series of disastrous fires? Damage by fire in the month of August was estimated to have cost millions of dollars, but the odd thing is that these fires all started inside buildings where, one would imagine, the climate was impervious to outside influences. Perhaps pyromaniacs are at work, and choose a time of water shortage in the hope of ensuring that their devil's work is not prematurely extinguished.

It is possible that the unseasonable drought is partly due to deforestation north-east of Kuala Lumpur, and partly to the removal of so many of the city's roadside trees, referred to in these columns in April of last year. The city fathers have promised us an instant programme of rearborification (if there is such a word), which we impatiently await.

Your reporter is new to town-dwelling and is astonished at the Kuala Lumpurians' apparent unawareness of the atmospheric pollution in their city. The odd bits of silver around the house are a telling indicator; in the years of living in the rural areas, the silver would need a clean about once a month when it had become a little dull. In Kuala Lumpur, it goes brown in a week. Perhaps extra oxygen from the promised new trees may ameliorate matters, provided that the trees themselves don't succumb to the depradations of ozone.

Another aspect of the water supply which we did not mention in the last *Dateline*, is that the filtration is not all that good, although this is not readily detectable. Perhaps the *dhobi* is a little less bright, but the revealing evidence emerges when the water is left in the bath overnight (to counter possible over-dehumidification by the air-conditioner—another necessary evil in the metropolis) and, the following morning there is a considerable, muddy deposit on the bottom of the bath. In suspension, that is when the bathwater has been newly drawn, the mud content, is quite invisible, and because there are probably so few oddballs about who leave the used water in the bath overnight, the majority of the populace is unaware of the paucity or absence of filtration. The chlorination previously referred to, also has the effect of taking the 'softness' out of the water, so we are losing all round.

The latest news about water supplies is that most of the States are about to introduce fluoridation at source, and if this latest 'big-brother' trespass is to apply to us in KL, then at least we should be able to demand clean (if monkeyed-about-with) water.

The Straits Times is now *New Straits Times* but apart from this subtle change, the need for which escapes the average reader, one can detect little new. There was perhaps a discernible difference some months ago when the government acquired an interest in the newspaper, and the editorial outlook changed from the pusillanimous to the sycophantic. Of the unchanged items, the day's television programme is still a poor guide to what one will actually see on the box. As we have no *Radio Times* here, anything resembling planned viewing is out of the question. Events such as the Asian Games, planned months in advance, suddenly appear in the evening's programme, unannounced and replacing whatever it was one tuned in to see. One does not even get an apology.

Would-be solvers of the 'daily' crossword are regularly irritated, not so much by the sporadic appearance of the puzzle, and its not having a regular place, but by publication of the wrong answers from time to time. Sometimes an answer will appear marked 'yesterday's solution' when there was no puzzle published yesterday. Sometimes the solution is to a puzzle which has not been published at all.

This lack of consideration for the buyer is certainly applicable to the government-controlled radio and television service with no proper published programme in advance of the day itself. Even then, the programme appearing in the morning or even afternoon paper, can only be regarded as a rough guide, especially concerning the evening's TV schedule. Then again, the programmes are fatly padded out with American 'Series' whose episodes do not necessarily appear in chronological order:

often this is not relevant but when it is, the intelligent viewer is considerably put out. Perhaps it is thought that there are not enough intelligent viewers to be worth bothering about.

At the risk of inviting epithets such as 'Moantime Kuala Lumpur', we will pursue another television topic. The imported films such as the Asian Games, World Cup football, *etc.* are invariably of a higher quality than our local 'live broadcasts'. We even got a picture by satellite of the World Cup final which was strikingly clearer than the studio transmission immediately preceding it.

Thinking of this great pictorial disparity reminds one that not only are these satellite telecasts of such comparatively high quality, they are all of 'live' sports broadcasts. This in turn brings to mind the fact that a 'live' telecast of a sporting event in Malaysia itself is an unknown quantity. Why should this be? We have many international sports events here, motor-racing, badminton, table tennis, *etc.* Is it that we have insufficient cameras? We certainly seem to be short of sound-recording equipment—many a film of a ministerial speech is unaccompanied by sound.

There is no shortage of talent among Malaysians, as witness the stupendous success of our national airline, MAS. A recent independent passenger survey tells us that, in the two years since its birth, MAS has become the third most popular airline among its rivals in the Orient Airlines Association and seventh among the 51 worldwide airlines covered in the study.

Why can't this drive, imagination and dedication be applied to our television and radio services?

Colour television, promised for January 1975 seems further away than ever, not to mention stereo and FM radio. Singapore has had the latter for years and is at this time engaged in test transmissions of colour television. In Malaysia there is no word about either of these advances. Perhaps RTM could import some drive from MAS, or even RTS— but we impatiently await some sign of progress and interest in giving the public its money's worth.

How we suffer in this delightful city! It is however a pleasure to practice what we preached in last month's editorial 'The Value of Criticism'.

JMN

Book review

Proceedings of the First National Symposium on Plantation Crops

December 8–9, 1972 Trivandrum, Kerala, India.

The symposium was sponsored by the Indian Society of Plantation Crops, the Indian Society of Agricultural Research, the Kerala Government and the Central Silk Board. In all, seven sessions dealt with some aspects of genetics and plant breeding, agronomy and soil science, physiology and bio-chemistry, plant pathology, entomology, technology and general subjects. Crops involved included coconuts, tea, pepper, ginger, cardamom, cloves, rubber, coffee, arecanut, cocoa, cashewnut, coriander and major spices as a group.

In all, fifty-six papers were presented, although a number of them are represented only by abstracts or summaries in the proceedings. The general standard of the papers is high and although many are concerned with crops which command little interest in the Malaysian plantation industry, there is a great deal of general interest throughout.

Of the papers which will be of particular interest in Malaysia, that by Nelliat, *NPK nutrition of coconut palm—a review*, is outstanding.

The proceedings have obviously been carefully edited and, although Malaysian interest will be largely confined to the papers on coconuts, there is much here for research workers and crop diversification enthusiasts in the field of tropical agriculture.

This useful 213-page soft cover book not only reproduces all the papers, each with its record of the conference discussion, but also contains an introduction, a summary and a table of contents: it is available from The Secretary, Indian Society for Plantation Crops, Central Plantation Crops Research Institute, Kasargod—670 124, Kerala, India.

The stated price is Rs. 50.00, US$20.00 or £8, which indicates either a misprint, that the ISPC charges far too much for its publications or that our Society does not charge nearly enough.

Kuala Lumpur,
24 September 1974. G C McC.

P.S. In the preface the editor declares that there is no absolute definition of plantation crops, but surely a plantation crop is any crop set out in plantings. A plantation is a collection of plantings under one management and a planter is the chap responsible for setting out the plantings whether these be padi plantings in Malaysia, forestry plantings in Scotland or tea plantings in India. Which brings me to the point that there appears to have been a dearth of planters at the symposium, or does my statement stem from plantocracy.

A $50 and a $25 prize are being offered for the best definition of planter, or plantation or plantation crops, or plantocracy submitted on or before the 20th October, 1974. Serious or humorous. In cartoon form if you like.

Letter to the Editor

Dear sir,

I would like to refer to the editorial of the January *Planter*, and would have written sooner but for the fact that the issue was received rather late.

I read the editorial with considerable despondency. Such expressions as "...the increasingly scientific approach to planting..... encouraging a more serious-minded magazine" are full of gloomy forebodings, for in fact our technical articles have always been serious enough, and could easily be a little less so without any harm.

"The parochial style of former years" to which we are unlikely to return, just piles on the agony. For as I say, although we have always had some general articles they surely did not detract from the high technical standard of the scientific articles.

The gloomy outlook is only slightly dispersed, if at all, by your hope of "steering a course between a magazine having something for everybody and a journal which is uncompromisingly oriented towards the technical."

Not that I hanker after the Bridge Page the Ladies Page, or even the cross-word puzzle, but I do quail at the thought of *The Planter* consisting of nothing but long-winded technical articles all of which, by editorial request, are fitted into the same wearisome mould of presentation.

Why must one have a Summary, and an Introduction, and a Conclusion? There is too much repetitiveness, and if all these compartments are really necessary we could probably do with just the Summary and the Conclusion—and relegate the rest of the article to an Appendix, in small type.

The trouble with most of the technical articles is that the many points of practical interest which they contain are too often buried in a trough of technical dough, with no leavening of humour and with none of those bright and unexpected flashes of perception which are the signs of a vivacious and enquiring intelligence.

Rather ironically, I had no sooner read the editorial and made my criticisms than I turned the pages and found a technical article which is perhaps the exception which proves the rule. It was called "Oil palm pollination and pruning: some new light on old ideas".

The author is a well-known technical man on oil palm research. He makes a tiny genuflection to the editorial layout mould by at least fulfilling 'Rule No 1—Summary'. After that, thank heavens, he goes his own sweet way.

This article completely refutes the implicit proposition that technical articles must be serious-minded. Though of great interest to the practical planter it can yet be read with ease and pleasure, because its undoubted inner seriousness is conveyed in a light and non-stodgy style.

Other authors please note.

2747

18 Sept '74

Social and Personal

Honours and Awards

EARP Douglas Arthur, MBE — Awarded the designation and Diploma of Fellow of the Incorporated Society of Planters (FISP) on 24th September 1974.

Birth

BALLARD: Timothy James born to Marion and Stuart in Rabaul, Papua New Guinea, on 31 August 1974

Death

BROWN: K Brown, suddenly at Orchard Farm, Hanghley, Suffolk on 16 September 1974

On leave

3491 Macpherson, D A, AISP, "Glen—Ann", Barrhill Road, Dalbeattie, Kirkcudbrightshire, Scotland

4296 Vehmendahl, K V, c/o Landgraaf 56, Nieuwenhagen—L, Holland

Returned from leave

5037 Bonner, P W I, Muar River Estate, Segamat, Johore

4477 Brown, T P, NDA, AISP, Sungei Sedu Estate, Banting, Selangor

4551 Richmond, K A B, BAL Estates Sdn Bhd, P O Box 135, Tawau, Sabah

Change of address

5670 Abdul Rahim b Syed Mohamed (Syed), Brooklands Estate, Banting, Selangor

5852 Ahmad Zaini bin Mohd Tahir, New Pogoh Estate, Segamat, Johore

5958 Abd Kudus bin Abd Rahman, 31-A Jalan Kilang, Malacca

5392 Abdul Rahim bin Othman, Norseman Estate, Ulu Sepetang, Taiping, Perak

5548 Chen Fai Kok, AISP, Jabor Valley Estate, Kuantan, Pahang

5455 Chin Kwoon Kok, Michael, Taiping Oil Industries Sdn Bhd, P O Box 39, Taiping, Perak

4518 Gillbanks, R A, Mosa Plantation, P O Kimbe, West New Britian, Papua New Guinea

5005 Joseph, C I, Sungala Estate, Port Dickson, Negri Sembilan

4757 Khoo Hong Thor, Robert, Kerling Estate, Kerling, Selangor

3967 Lai Thian Sang, c/o Toufic Ni Dean & Sons, P O Box 33, Greenville, Sinoe County, Liberia, West Africa

6027 Leong Jin Wah, Kulai Oil Palm Estate, P O Box 108, Kulai, Johore

5731 Lim Heng Kit, Paul, Rancangan Langkon, P O Box 107, Kudat, Sabah

4928 Mohd Zain bin Hj Abdul Rahim, Sepang Estate, Sepang, Selangor

5829 Ng Hark Peng, Sua Betong Estate, Port Dickson, Negri Sembilan

4239 Nowak, J, AISP, Firestone Plantations Co, Harbel, Liberia, West Africa

5835 Omar bin Haji Harun, c/o M D M, 12/18 Jalan Kemajuan, Petaling Jaya, Selangor

5417 Piong Sim, Ulu Yam Estate, Rawang, Selangor

4874 Radhakrishnan, K, DTA, AISP, 3 Wise Road, Seremban, Negri Sembilan

5889 Siow Heng Kin, Layang Estate, P O Box 105, Layang Layang, Johore

5830 Sumathri, G V, Harvard Estate, Bedong, Kedah

5013 Tan Kee Eun, Alfred, Sungei Wangi Estate, Sitiawan, Perak

6050 Wong Chew Ming, Sabai Estate, Karak, Pahang

5922 Wong Kai Choo, 1 Jalan SS 2/12, Taman Bahagia, Petaling Jaya, Selangor

5523 Zainal Abidin b Muhamad, Kuala Gris Estate, Kuala Krai, Kelantan

5451 George, A, Scarboro Estate, Sungei Patani, Kedah

5885 Ho Thian Hua, No 48, Jalan SS 1/38, Petaling Jaya, Selangor

5169 Hudson, I S, Danes Croft, Cottles Lane, Turleigh, Bradford-on-Avon, Wiltshire, England

4772 Khor Ching Weng, 34 Jalan Tan Jit Seng, Tanjong Bungah, Penang

5431 Lim Hean Peng, Patrick, Sungei Rawang Estate, Sepang, Selangor

5438 Mokhtar b Hj Hashim, Y B, Timbalan Menteri Pertanian dan Pembangunan Luarbandar, Jalan Swettenham, Kuala Lumpur

6055 Rosman b Hussein, Kelan Estate, Kulai, Johore

5678 Subramaniam, L, AISP, Sungei Bernam Estate, Rajah Hitam Division, Teluk Anson, Perak

4322 Walker, J A, Benta Estate, Benta, Pahang

5088 Tan See Yeok AISP, Subur Estate, Batu Kurau, Perak.

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The Incorporated Society of Planters

Founded 1919

THE SOCIETY REPRESENTS the Planters of Malaysia and other territories, whose personal and professional interests it is bound to endeavour to secure and promote.

OBJECTS foremost in the Society's Memorandum of Association are:

To promote the general interests of the planting profession.

To promote the advancement and facilitate the acquisition of that knowledge which constitutes the professional qualification of planter.

To watch over, promote and protect the mutual and individual interests of its members in respect of matters pertaining to or arising from their employment in the planting profession.

To promote and maintain good feeling, co-operation and understanding between members and their employers.

ACHIEVEMENTS of the Society are a technical education scheme, the publication of authoritative works on tropical agriculture, a monthly magazine featuring original technical articles, the sponsorship of conferences and symposia on tropical crops, and the organisation of joint consultation with employers.

MEMBERSHIP of the Society is open to: —

A Those directly employed in plantation management such as estate managers, assistant managers, superintendents, supervisors and cadets, and

B Executive engineers, estate medical officers, and qualified scientific or administrative staff of estates or organisations mainly concerned with the planting industry.

Category B may include those employed in such other senior executive, administrative, professional or advisory capacities as may be deemed by the Executive Council as being equivalent thereto

Neither category shall include clerks, conductors, hospital assistants, etc.

ENTRANCE FEE for new and rejoining members is $10/- and must accompany application.

ANNUAL SUBSCRIPTION RATES* are as follows: —

	During the calendar year in which eligibility for membership occurred and the 4 succeeding calendar years.	Subsequently
Category A		
Ordinary Members employed as Managers, Assistant Managers etc. and normally resident in:		
Malaya and Singapore	$ 48	$ 78
East Malaysia and Brunei	$ 44	$ 60
Category B		
Ordinary Members employed as Executive Engineers, Estate Medical Officers, Research Staff etc., wherever resident	$ 48	$ 48
Approved Overseas territories	$ 44	$ 44

* Rates are proportionate for a part-year when joining.

Officers of the Society are listed overleaf

Officers

Chairman

Tan See Yeok AISP
Subur Estate
Batu Kurau, Perak

Vice-Chairman

Mahbob bin Abdullah AISP
Pamol Headquarters
P O Box 1
Kluang, Johore

Executive Secretary

W Newall
P O Box 262
Kuala Lumpur

Executive Committee

Tan See Yeok AISP (*Chairman*)
Mahbob bin Abdullah AISP (*Vice-chairman*)
W Newall (*Secretary*)
Baharuddin bin Ngah AISP
D A Earp MBE FISP
Johari bin Abbas AISP
J G M Price
B S Sekhon AISP

Technical Education Scheme Committee

Johari bin Abbas AISP (*Chairman*)
W Newall (*Secretary*)
Khoo Khee Ming B Agric SC
Mahbob bin Abdullah AISP
C J Sergeant NDA AISP
Tan Teo Kim

Finance Committee

Tan See Yeok AISP (*Chairman*)
Mahbob bin Abdullah AISP (*Vice-chairman*)
W Newall (*Secretary*)
Baharuddin bin Ngah AISP
D A Earp MBE FISP
Johari bin Abbas AISP
G C McCulloch FISP
J G M Price
B S Sekhon AISP

Executive Councillors

B Allen-Edmett *Johore North*
A Arikiah *Johore Central* (Ag)
Baharuddin bin Ngah AISP *Selangor*
Paul K L Chin *Sabah: Tawau*
Mohd Dahlan bin Kassim *Kelantan/Trengganu*
K P Jeyarajah *S Trengganu/E Pahang*
Khoo Kay Tuan AISP *Negri Sembilan*
Lim Hong Joon *Perak Central*
C P Menon *Pahang West*
J G M Price *Johore South*
B S Sekhon AISP *Kedah/Penang*
O F Wakefield *Perak Lower*
Wan Habib bin Syed Mahmud (convenor) *Sarawak*
A J Wong *Sabah: Northeast*
Wong Non Lin AISP *Malacca/Muar*
D A Earp MBE FISP (co-opted)
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G C McCulloch FISP (co-opted)

Advertisement index

Advertisement index

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It gives the most economical control of grasshoppers on young rubber, termites in rubber, grasshoppers on cover crops, cockchafers and grasshoppers in oil palm, termites in cocoa, ants in pepper, padi pests, orchid pests, mosquitoes, cockroaches, cutworms, ants. And it's the best way to protect buildings against termites.

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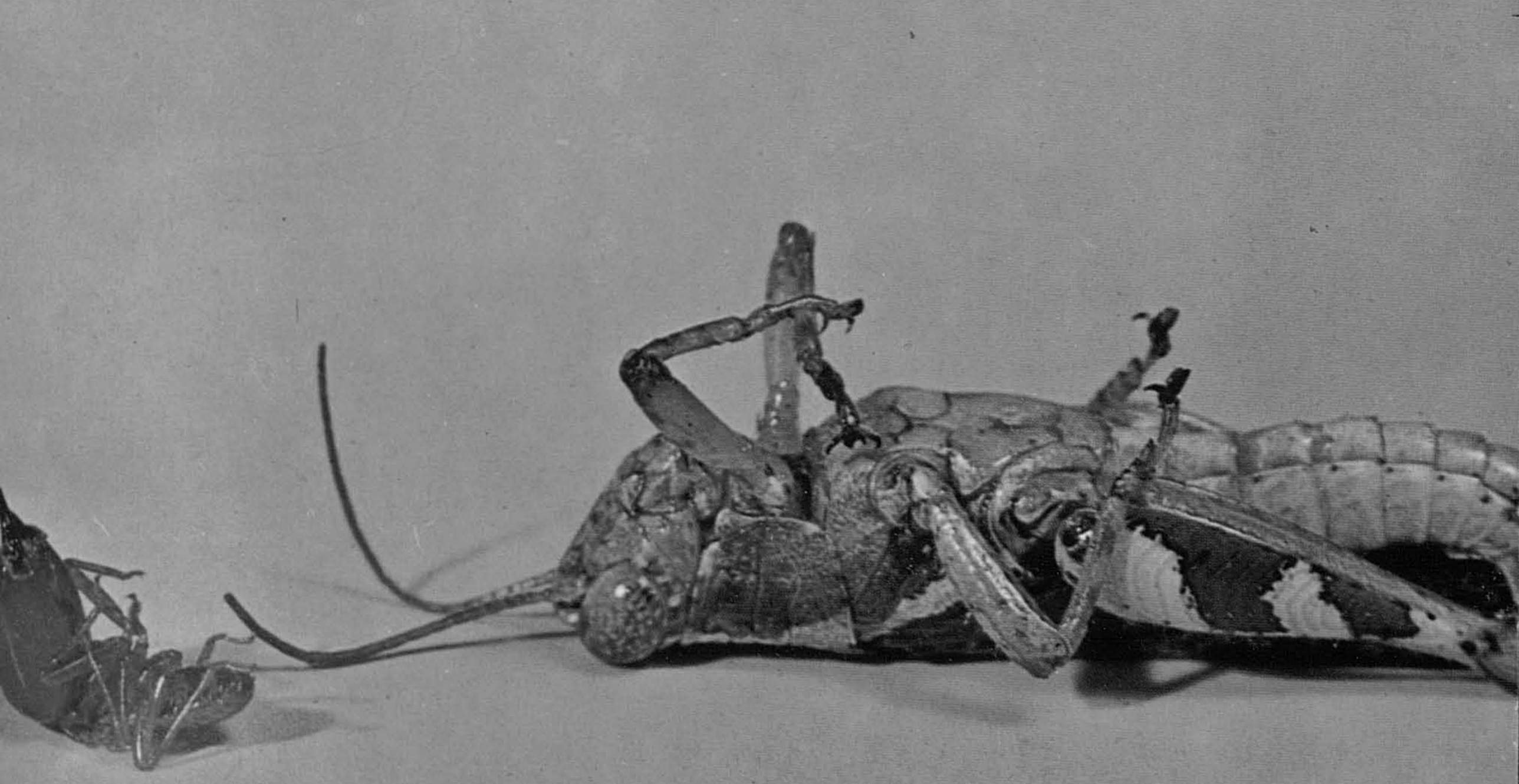
Most economical termite terminator, grasshopper bopper etc.



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He'll be able to tell you the product for your particular problem. And he'll tell you even if we don't make that particular product.

Products for problems

Shell Chemicals